Scheme & Syllabus of
UNDERGRADUATE DEGREE COURSE

B.Tech. VII & VIII Semester

Civil Engineering

Rajasthan Technical University, Kota
Effective from Session: 2020-21

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Scheme & Syllabus

IV Year- VII & VIII Semester: B. Tech. (Civil Engineering)

Teaching & Examination Scheme
B.Tech.: Civil Engineering
4th Year - VII Semester

	THEORY											
SN	**Category**	**Course Code**	**Course Title**	**Hours Per Week**			**Marks**				**Cr**
				L	**T**	**P**	**Exm Hrs**	**IA**	**ETE**	**Total**	
1	PCC	7CE4-01	Transportation Engineering	3	0	0	3	30	120	**150**	**3**
2	OE		Open Elective-I	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	7CE4-21	Road Material Testing Lab	0	0	2		30	20	**50**	**1**
4		7CE4-22	Professional Practices & Field Engineering Lab	0	0	2		30	20	**50**	**1**
5		7CE4-23	Soft Skills Lab	0	0	2		30	20	**50**	**1**
6		7CE4-24	Environmental Monitoring and Design Lab	0	0	2		30	20	**50**	**1**
7	PSIT	7CE7-30	Practical Training	1	0	0		75	50	**125**	**2.5**
8		7CE7-40	Seminar	2	0	0		60	40	**100**	**2**
9	SODECA	7CE8-00	SODECA	0	0	0		0	25	**25**	**0.5**
			Sub- Total	**3**	**0**	**8**		**255**	**195**	**450**	**9**
			TOTAL OF VII SEMESTER	**9**	**0**	**8**		**315**	**435**	**750**	**15**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*
ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

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RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech.: Civil Engineering
4th Year - VIII Semester

	THEORY										
SN	Category	Course Code	Course Title	Hours Per Week			Marks				Cr
				L	T	P	Exm Hrs	IA	ETE	Total	
1	PCC	8CE4-01	Project Planning and Construction Management	3	0	0	3	30	120	**150**	**3**
2	OE		Open Elective-II	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	8CE4-21	Project Planning & Construction Management Lab	0	0	2		30	20	**50**	**1**
4		8CE4-22	Pavement Design	0	0	2		30	20	**50**	**1**
5	PSIT	8CE7-50	Project	3	0	0		210	140	**350**	**7**
6	SODECA	8CE8-00	Social Outreach, Discipline & Extra Curricular Activities	0	0	0		0	25	**25**	**0.5**
			Sub- Total	**0**	**0**	**4**		**270**	**205**	**475**	**9.5**
			TOTAL OF VIII SEMESTER	**9**	**0**	**4**		**330**	**445**	**775**	**15.5**

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List of Open Electives for Civil Engineering			
Subject Code	**Title**	**Subject Code**	**Title**
Open Elective - I		**Open Elective - II**	
7AG6-60.1	Human Engineering and Safety	8AG6-60.1	Energy Management
7AG6-60.2	Environmental Engineering and Disaster Management	8AG6-60.2	Waste and By-product Utilization
7AN6-60.1	Aircraft Avionic System	8AN6-60.1	Finite Element Methods
7AN6-60.2	Non-Destructive Testing	8AN6-60.2	Factor of Human Interactions
7CH6-60.1	Optimization Techniques	8CH6-60.1	Refinery Engineering Design
7CH6-60.2	Sustainable Engineering	8CH6-60.2	Fertilizer Technology
7CR6-60.1	Introduction to Ceramic Science & Technology	8CR6-60.1	Electrical and Electronic Ceramics
7CR6-60.2	Plant, Equipment and Furnace Design	8CR6-60.2	Biomaterials
7CS6-60.1	Quality Management/ISO 9000	8CS6-60.1	Big Data Analytics
7CS6-60.2	Cyber Security	8CS6-60.2	IPR, Copyright and Cyber Law of India
7EE6-60.1	Electrical Machines and Drives	8EE6-60.1	Energy Audit and Demand side Management
7EE6-60.2	Power Generation Sources.	8EE6-60.2	Soft Computing
7EC6-60.1	Principle of Electronic communication	8EC6-60.1	Industrial and Biomedical applications of RF Energy
7EC6-60.2	Micro and Smart System Technology	8EC6-60.2	Robotics and control
7ME6-60.1	Finite Element Analysis	8ME6-60.1	Operations Research
7ME6-60.2	Quality Management	8ME6-60.2	Simulation Modeling and Analysis
7MI6-60.1	Rock Engineering	8MI6-60.1	Experimental Stress Analysis
7MI6-60.2	Mineral Processing	8MI6-60.2	Maintenance Management
7PE6-60.1	Pipeline Engineering	8PE6-60.1	Unconventional Hydrocarbon Resources
7PE6-60.2	Water Pollution control Engineering	8PE6-60.2	Energy Management & Policy
7TT6-60.1	Technical Textiles	8TT6-60.1	Material and Human Resource Management
7TT6-60.2	Garment Manufacturing Technology	8TT6-60.2	Disaster Management

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RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

IV Year- VII & VIII Semester: B. Tech. (Civil Engineering)

7CE4-01: Transportation Engineering

Credit 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3Hours**

SN	Contents	Hours
1	**Introduction:** Objective, scope and outcome of the course	1
2	**Highway planning and alignment:** Different modes of transportation – historical Development of road construction- Highway Development in India –Classification of roads- Road pattern – Highway planning in India- Highway alignment - Engineering Surveys for alignment – Highway Project- Important Transport/Highway related agencies in India. PMGSY project. Introduction about IRC, NRRDA	5
3	**Geometric Design of highways:** The highway crosses sectional elements- Camber-Sight Distance - Types of sight distances -Design of horizontal alignments - Super elevation, Widening of Pavements on horizontal curves- transition Curves- Design of Vertical alignments – Gradients- summit and Valley Curves- Recommendations of IRC Codes of Practice.	7
4	**Highway Materials:** Desirable Properties, Testing Procedures, Standards and standard values relating to Soil, Stone Aggregates, Bitumen and Tar, fly- ash/pond-ash. Role of filler in Bituminous mix, materials of filler. Specifications of DLC and PQC for rigid pavement	6
5	**Highway Construction and Equipments:** Methods of constructing different types of roads viz. Earth roads, Stabilized roads, WBM, WMM roads, earthen embankments, DLC and embankments with fly ash. Bituminous roads and Concrete roads. Berms and Shoulders, Features of rural roads including those in PMGSY. Hot mix plant for Bituminous roads-components, layout, control panel, quality assurance. Highway construction of rigid and flexible pavements including types of road rollers, specifications of compactionofdifferentlayersofbituminousroads, modernpavers for CC roads. Roller compacted concrete road construction	8
6	**Design of flexible and rigid pavements as per IRC:** IRC provisions including those of IRC 37, IRC 58	5
7	**Introduction of Railway Engineering:** Types and Selection of Gauges, Selection of Alignment, Ideal Permanent Ways and Cross-sections in different conditions, Drainage, Salient Features and types of Components viz. Rails, Sleepers, Ballast, Rail Fastenings.	3
8	**Introduction of Airports and Harbours: Airport Engineering: -** Introduction: Requirements to Airport Planning, Airport Classifications, Factors in Airport Site Selection, Airport Size. Planning of Airport: Requirements of Airport- Terminal Area, Runway Length etc. **Harbours:** history of water transportation, modern trends in water transportation, components of harbour, classification of harbours. Ports and docks.	5
	Total	**40**

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	Text / Reference Books:
1	Highway Engineering by Khanna SK & CG Justo, Nem Chand & Brothers, Roorkee.
2	Highway Engg. By LR Kadyali, Khanna Tech Publications, Delhi.
3	Specifications for Roads & Bridges by Ministry of Road Transport & Highways and Indian Road Congress.
4	Railway Engineering by Satish Chandra and MM Agarwal, Oxford University Press, Delhi.
5	Railway Engineering by Saxena SC and Arora SP, Dhanpat Rai Publishers, Delhi.
6	S C Rangwala, airport engineering, Charotar publication house.
7	Gautam H. Oza, Dock &Harbour Engineering, Charotar publication House.

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7CE4-21: Road Material Testing Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P

1. Aggregate ImpactTest
2. To determine the Angularity Number, Flakiness Index & Elongation Index of aggregates
3. Los Angeles AbrasionTest
4. Aggregate Crushing ValueTest
5. Standard Tar Viscometer Test for given bitumensample
6. Ductility Test for a given bitumensample
7. To determine the softening point for given sample ofbitumen.
8. Marshall StabilityTest
9. FloatTest
10. Preparation of Dry lean concrete mix and testing of itsstrength

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7CE4-22: Professional Practices and Field Engineering Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**

0L+0T+2P

1. Different types ofKnots
2. Site plan, index plan, layout plan, plinth area, floor area ofbuildings
3. Foundation plan layout infield
4. Bar bendingschedule
5. Specifications- For different classes of building and Civil Engineeringworks
6. Specifications of buildingcomponents
7. Valuation of buildings andproperties
8. Work at heights – scaffolding and ladders use, type of scaffolds, safety requirements, design and load factors, defects and inspection norms, type of ladders, upkeep, defects and good maintenancetips

7CE4-23: Soft Skills Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**

0L+0T+2P

SOFT SKILLS- Introduction to Soft Skills, Aspects of Soft Skills, Identifying your Soft Skills, Negotiation skills, Importance of Soft Skills, Concept of effective communication. SELF-DISCOVERY- Self-Assessment, Process, Identifying strengths and limitations, SWOT AnalysisGrid.

PREPARING CV/RESUME – Introduction, meaning, difference among bio-data, CV and resume, CV writing tips. Do's and don'ts of resume preparation, Vocabulary for resume, common resume mistakes, cover letters, tips for writing cover letters.

INTERVIEW SKILLS - Introduction. Types of interview, Types of question asked, Reasons for rejections, Post-interview etiquette, Telephonic interview, Dress code at interview, Mistakes during interview, Tips to crack on interview, Contextual questions in interview skills, Emotional crack an interview, Emotional intelligence and critical thinking during interview process.

DEVELOPING POSITIVE ATTITUDE – Introduction, Formation of attitude, Attitude in workplace, Power of positive attitude, Examples of positive attitudes, Negative attitudes, overcoming negative attitude and its consequences,

IMPROVING PERCEPTION- Introduction, Understanding perception, perception and its application inorganizations.

CAREER PLANNING – Introduction, Tips for successful career planning, Goal setting immediate, short term and long term, Strategies to achieve goals, Myths about choosing career.

TEAM BUILDING AND TEAM WORK - Introduction, Meaning, Characteristics of an effective team, Role of a Team Leader, Role of Team Members, inter group Collaboration Advantages, Difficulties faced, Group Exercises-Team Tasks and Role-Play, Importance of Group Dynamics.

TIME MANAGEMENT: The Time management matrix, apply the Pareto Principle (80/20 Rule) to time management issues, to prioritize using decision matrices, to beat the most common time wasters, how to plan ahead, how to handle interruptions , to maximize your personal effectiveness, how to say "no" to time wasters, develop your own individualized plan of action.

STRESS MANAGEMENT – Introduction, meaning, positive and negative stress, Sources of stress, Case studies, signs of stress, Stress management tips, Teenage stress.
Group discussion practice on current topics, Quantitative aptitude and reasoning preparation.

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	Text / Reference Books:
1	Butterfield, Jeff, 'Soft Skills for Everyone', Cengage Learning, New Delhi, 2010.
2	G.S. Chauhan and Sangeeta Sharma, 'Soft Skills', Wiley, New Delhi, 2016.
3	Klaus, Peggy, Jane Rohman& Molly Hamaker, 'The Hard Truth About Soft Skills', Harper Collins E-books, London, 2007.
4	S.J. Petes, Francis, 'Soft Skills and Professional Communication', Tata McGraw Hill Education, New Delhi, 2011.
5	Dr. R. S. Aggarwal, Quantitave aptitude & reasoning, S Chand & company ltd.
6	Dr. R. S. Aggarwal, A modern approach to Verbal & Non-verbal reasoning, S Chand & company ltd.

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7CE4-24: Environmental Monitoring and Design Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P

Design:

1. Sewer design and estimation of Waste/Storm water bysoftware.
2. Design of Water Treatment Plant and Sewage TreatmentPlant
3. Design of Oxidation pond, stabilization pond and aeratedlagoons.
4. Design of aerobic and anaerobicdigester.

Lab:

1. Demonstration of air pollution monitoring instruments namely, High volume sampler
2. Determination of SPM, $PM_{10}$and$PM_{2.5}$.
3. Demonstration of noise pollution monitoring equipment namely, modular precision sound levelmeter.
4. Air quality monitoring for Traffic/Residential locality and its effect on the environment.
5. Noise quality monitoring for Traffic/Residential locality and its effect on the environment.
6. Latest technology for management of municipal solid waste, e-waste, bio-medical waste and their prevalent rules andregulations.

	Recommended Texts:
1	Manual on Sewerage and Sewage Treatment Systems – 2013, CPHEEO, New Delhi
2	Compendium of sewage treatment technologies Published by NRCD, MoEF, GOI, 2009
3	Storm Water Management Model (SWMM) and Manual, Published by US EPA
4	IS 5182-23 (2006) published by Bureau of Indian Standards
5	IS 4758: 1968 published by Bureau of Indian Standards
6	MoEF Guidelines and amendments as updated onhttp://moef.gov.in
7	CPCB Guidelines and amendments as updated onhttps://cpcb.nic.in

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8CE4-01 Project Planning and Construction Management

Credit 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3Hours**

SN	Course Content	Hours
1	**INTRODUCTION:** Objective, scope and outcome of the course	1
2	**FINANCIAL EVALUATION OF PROJECTS ANDPROJECT PLANNING:** Capital investment proposals, criterions to judge the worthwhile of capital projects viz. net present value, benefit cost ratio, internal rate of return, Risk cost management, main causes of project failure. Categories of construction projects, objectives, project development process, Functions of project management, Project management organization and staffing, Stages and steps involved in project planning, Plan development process, objectives ofconstruction project management.	7
3	**PROJECT SCHEDULING:** Importance of project scheduling, project work breakdown process – determining activities involved, work breakdown structure, assessing activity duration, duration estimate procedure, Project work scheduling, Sequence of construction activities, Project management techniques – CPM and PERT networks analysis, concept of precedence network analysis.	8
4	**PROJECT COST AND TIME CONTROL:** Monitoring the time progress and cost controlling measures in a construction project, Time cost trade-off process: direct and indirect project costs, cost slope, Process of crashing of activities, determination of the optimum duration of a project, updating of project networks, resources allocation.	8
5	**CONTRACT MANAGEMENT:** Elements of tender operation, Types of tenders and contracts, Contract document, Legal aspects of contracts, Contract negotiation & award of work, breach of contract, determination of a contract, arbitration.	8
6	**SAFETY AND OTHER ASPECTS OF CONSTRUCTION MANAGEMENT:** Safety measures to be followed in various construction works like excavation, demolition of structures, explosive handling, hot bitumen work. Project Management Information System – Concept, frame work, benefits of computerized information system. Environmental and social aspects ofvarious types of construction projects.	8
	Total	40

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	Recommended Texts:
1	Construction Planning & management By P S Gahlot& B M Dhir, New Age International Limited Publishers
2	Construction Project planning & Scheduling by Charles Patrick, Pearson, 2012
3	Construction Project Management Theory & practice --- Kumar Neeraj Jha, Pearson, 2012
4	Modern construction management--Harris, Wiley India.
5	Construction Management & Planning by Sengupta and Guha-Tata McGraw Hill publication.
6	Project Management – K Nagrajan – New age International Ltd.
7	Professional Construction Institute Edition.
8	Construction Project Management Planning, Scheduling and Controlling-Chitakara- Tata McGraw Hill, New Delhi
9	Construction Planning, Equipment and Methods by R. L. Peurify

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8CE4-21: Project Planning and Construction Management Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**

0L+0T+2P

1. Assignments on net present value, benefit cost ratio, internal rate ofreturn
2. Types of contracts – Tenders, tender form, submission and opening of tenders, measurement book, muster roll, piecework agreement and work order.
3. Drafting of tender documents, special terms andconditions
4. Drafting of tender notices for different types ofworks
5. Different models of PPP like BOT, BOOTetc.
6. Arbitration
7. Preparation of bardiagram
8. Network Analysis using PERT andCPM

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8CE4-22: Pavement Design

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P

1. **Pavement Mix Analysis**: Aggregate blending, bituminous mix design – Marshall Stability approach, concrete mix design for DLC and PQC with IS codeprovisions.
2. **Pavement Basics:** Types & comparison, vehicular loading pattern, factors affecting design and performance of pavements, sub graderequirements.
3. **Design of Flexible Pavements**: Analytical approach, flexible pavement layers, ESWL, repetitions of load, techniques of design methods, wheel load analysis, traffic analysis, stress distribution in subgrade soil, Burmister's theories, group index method, CBR approach, IRC 37 and otherguidelines.
4. **Design of Concrete Pavements**: Westergaard's approach, temperature & frictional stresses, design of expansion & longitudinal joints, design of dowel & tie bars, IRC 58 and otherguidelines.
5. **Specifications for rural roads:** Important aspects of IRC SP 020, Rural Road Manual. NRRDA publications

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Scheme & Syllabus of
UNDERGRADUATE DEGREE COURSE

B.Tech. VII & VIII Semester

Civil Engineering

Rajasthan Technical University, Kota
Effective from Session: 2020-21

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Scheme & Syllabus

IV Year- VII & VIII Semester: B. Tech. (Civil Engineering)

Teaching & Examination Scheme
B.Tech.: Civil Engineering
4th Year - VII Semester

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SN	**Category**	**Course Code**	**Course Title**	**Hours Per Week**			**Marks**				**Cr**
				L	**T**	**P**	**Exm Hrs**	**IA**	**ETE**	**Total**	
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2	OE		Open Elective-I	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
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7	PSIT	7CE7-30	Practical Training	1	0	0		75	50	**125**	**2.5**
8		7CE7-40	Seminar	2	0	0		60	40	**100**	**2**
9	SODECA	7CE8-00	SODECA	0	0	0		0	25	**25**	**0.5**
			Sub- Total	**3**	**0**	**8**		**255**	**195**	**450**	**9**
			TOTAL OF VII SEMESTER	**9**	**0**	**8**		**315**	**435**	**750**	**15**

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RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech.: Civil Engineering
4th Year - VIII Semester

	THEORY										
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				L	T	P	Exm Hrs	IA	ETE	Total	
1	PCC	8CE4-01	Project Planning and Construction Management	3	0	0	3	30	120	**150**	**3**
2	OE		Open Elective-II	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
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			Sub- Total	**0**	**0**	**4**		**270**	**205**	**475**	**9.5**
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7CR6-60.1	Introduction to Ceramic Science & Technology	8CR6-60.1	Electrical and Electronic Ceramics
7CR6-60.2	Plant, Equipment and Furnace Design	8CR6-60.2	Biomaterials
7CS6-60.1	Quality Management/ISO 9000	8CS6-60.1	Big Data Analytics
7CS6-60.2	Cyber Security	8CS6-60.2	IPR, Copyright and Cyber Law of India
7EE6-60.1	Electrical Machines and Drives	8EE6-60.1	Energy Audit and Demand side Management
7EE6-60.2	Power Generation Sources.	8EE6-60.2	Soft Computing
7EC6-60.1	Principle of Electronic communication	8EC6-60.1	Industrial and Biomedical applications of RF Energy
7EC6-60.2	Micro and Smart System Technology	8EC6-60.2	Robotics and control
7ME6-60.1	Finite Element Analysis	8ME6-60.1	Operations Research
7ME6-60.2	Quality Management	8ME6-60.2	Simulation Modeling and Analysis
7MI6-60.1	Rock Engineering	8MI6-60.1	Experimental Stress Analysis
7MI6-60.2	Mineral Processing	8MI6-60.2	Maintenance Management
7PE6-60.1	Pipeline Engineering	8PE6-60.1	Unconventional Hydrocarbon Resources
7PE6-60.2	Water Pollution control Engineering	8PE6-60.2	Energy Management & Policy
7TT6-60.1	Technical Textiles	8TT6-60.1	Material and Human Resource Management
7TT6-60.2	Garment Manufacturing Technology	8TT6-60.2	Disaster Management

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

IV Year- VII & VIII Semester: B. Tech. (Civil Engineering)

7CE4-01: Transportation Engineering

Credit 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3Hours**

SN	Contents	Hours
1	**Introduction:** Objective, scope and outcome of the course	1
2	**Highway planning and alignment:** Different modes of transportation – historical Development of road construction- Highway Development in India –Classification of roads- Road pattern – Highway planning in India- Highway alignment - Engineering Surveys for alignment – Highway Project- Important Transport/Highway related agencies in India. PMGSY project. Introduction about IRC, NRRDA	5
3	**Geometric Design of highways:** The highway crosses sectional elements- Camber-Sight Distance - Types of sight distances -Design of horizontal alignments - Super elevation, Widening of Pavements on horizontal curves- transition Curves- Design of Vertical alignments – Gradients- summit and Valley Curves- Recommendations of IRC Codes of Practice.	7
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6	**Design of flexible and rigid pavements as per IRC:** IRC provisions including those of IRC 37, IRC 58	5
7	**Introduction of Railway Engineering:** Types and Selection of Gauges, Selection of Alignment, Ideal Permanent Ways and Cross-sections in different conditions, Drainage, Salient Features and types of Components viz. Rails, Sleepers, Ballast, Rail Fastenings.	3
8	**Introduction of Airports and Harbours: Airport Engineering: -** Introduction: Requirements to Airport Planning, Airport Classifications, Factors in Airport Site Selection, Airport Size. Planning of Airport: Requirements of Airport- Terminal Area, Runway Length etc. **Harbours:** history of water transportation, modern trends in water transportation, components of harbour, classification of harbours. Ports and docks.	5
	Total	**40**

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	Text / Reference Books:
1	Highway Engineering by Khanna SK & CG Justo, Nem Chand & Brothers, Roorkee.
2	Highway Engg. By LR Kadyali, Khanna Tech Publications, Delhi.
3	Specifications for Roads & Bridges by Ministry of Road Transport & Highways and Indian Road Congress.
4	Railway Engineering by Satish Chandra and MM Agarwal, Oxford University Press, Delhi.
5	Railway Engineering by Saxena SC and Arora SP, Dhanpat Rai Publishers, Delhi.
6	S C Rangwala, airport engineering, Charotar publication house.
7	Gautam H. Oza, Dock &Harbour Engineering, Charotar publication House.

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7CE4-21: Road Material Testing Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P

1. Aggregate ImpactTest
2. To determine the Angularity Number, Flakiness Index & Elongation Index of aggregates
3. Los Angeles AbrasionTest
4. Aggregate Crushing ValueTest
5. Standard Tar Viscometer Test for given bitumensample
6. Ductility Test for a given bitumensample
7. To determine the softening point for given sample ofbitumen.
8. Marshall StabilityTest
9. FloatTest
10. Preparation of Dry lean concrete mix and testing of itsstrength

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7CE4-22: Professional Practices and Field Engineering Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**

0L+0T+2P

1. Different types ofKnots
2. Site plan, index plan, layout plan, plinth area, floor area ofbuildings
3. Foundation plan layout infield
4. Bar bendingschedule
5. Specifications- For different classes of building and Civil Engineeringworks
6. Specifications of buildingcomponents
7. Valuation of buildings andproperties
8. Work at heights – scaffolding and ladders use, type of scaffolds, safety requirements, design and load factors, defects and inspection norms, type of ladders, upkeep, defects and good maintenancetips

7CE4-23: Soft Skills Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**

0L+0T+2P

SOFT SKILLS- Introduction to Soft Skills, Aspects of Soft Skills, Identifying your Soft Skills, Negotiation skills, Importance of Soft Skills, Concept of effective communication. SELF-DISCOVERY- Self-Assessment, Process, Identifying strengths and limitations, SWOT AnalysisGrid.

PREPARING CV/RESUME – Introduction, meaning, difference among bio-data, CV and resume, CV writing tips. Do's and don'ts of resume preparation, Vocabulary for resume, common resume mistakes, cover letters, tips for writing cover letters.

INTERVIEW SKILLS - Introduction. Types of interview, Types of question asked, Reasons for rejections, Post-interview etiquette, Telephonic interview, Dress code at interview, Mistakes during interview, Tips to crack on interview, Contextual questions in interview skills, Emotional crack an interview, Emotional intelligence and critical thinking during interview process.

DEVELOPING POSITIVE ATTITUDE – Introduction, Formation of attitude, Attitude in workplace, Power of positive attitude, Examples of positive attitudes, Negative attitudes, overcoming negative attitude and its consequences,

IMPROVING PERCEPTION- Introduction, Understanding perception, perception and its application inorganizations.

CAREER PLANNING – Introduction, Tips for successful career planning, Goal setting immediate, short term and long term, Strategies to achieve goals, Myths about choosing career.

TEAM BUILDING AND TEAM WORK - Introduction, Meaning, Characteristics of an effective team, Role of a Team Leader, Role of Team Members, inter group Collaboration Advantages, Difficulties faced, Group Exercises-Team Tasks and Role-Play, Importance of Group Dynamics.

TIME MANAGEMENT: The Time management matrix, apply the Pareto Principle (80/20 Rule) to time management issues, to prioritize using decision matrices, to beat the most common time wasters, how to plan ahead, how to handle interruptions , to maximize your personal effectiveness, how to say "no" to time wasters, develop your own individualized plan of action.

STRESS MANAGEMENT – Introduction, meaning, positive and negative stress, Sources of stress, Case studies, signs of stress, Stress management tips, Teenage stress.
Group discussion practice on current topics, Quantitative aptitude and reasoning preparation.

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	Text / Reference Books:
1	Butterfield, Jeff, 'Soft Skills for Everyone', Cengage Learning, New Delhi, 2010.
2	G.S. Chauhan and Sangeeta Sharma, 'Soft Skills', Wiley, New Delhi, 2016.
3	Klaus, Peggy, Jane Rohman& Molly Hamaker, 'The Hard Truth About Soft Skills', Harper Collins E-books, London, 2007.
4	S.J. Petes, Francis, 'Soft Skills and Professional Communication', Tata McGraw Hill Education, New Delhi, 2011.
5	Dr. R. S. Aggarwal, Quantitave aptitude & reasoning, S Chand & company ltd.
6	Dr. R. S. Aggarwal, A modern approach to Verbal & Non-verbal reasoning, S Chand & company ltd.

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7CE4-24: Environmental Monitoring and Design Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P

Design:

1. Sewer design and estimation of Waste/Storm water bysoftware.
2. Design of Water Treatment Plant and Sewage TreatmentPlant
3. Design of Oxidation pond, stabilization pond and aeratedlagoons.
4. Design of aerobic and anaerobicdigester.

Lab:

1. Demonstration of air pollution monitoring instruments namely, High volume sampler
2. Determination of SPM, $PM_{10}$and$PM_{2.5}$.
3. Demonstration of noise pollution monitoring equipment namely, modular precision sound levelmeter.
4. Air quality monitoring for Traffic/Residential locality and its effect on the environment.
5. Noise quality monitoring for Traffic/Residential locality and its effect on the environment.
6. Latest technology for management of municipal solid waste, e-waste, bio-medical waste and their prevalent rules andregulations.

	Recommended Texts:
1	Manual on Sewerage and Sewage Treatment Systems – 2013, CPHEEO, New Delhi
2	Compendium of sewage treatment technologies Published by NRCD, MoEF, GOI, 2009
3	Storm Water Management Model (SWMM) and Manual, Published by US EPA
4	IS 5182-23 (2006) published by Bureau of Indian Standards
5	IS 4758: 1968 published by Bureau of Indian Standards
6	MoEF Guidelines and amendments as updated onhttp://moef.gov.in
7	CPCB Guidelines and amendments as updated onhttps://cpcb.nic.in

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8CE4-01 Project Planning and Construction Management

Credit 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3Hours**

SN	Course Content	Hours
1	**INTRODUCTION:** Objective, scope and outcome of the course	1
2	**FINANCIAL EVALUATION OF PROJECTS ANDPROJECT PLANNING:** Capital investment proposals, criterions to judge the worthwhile of capital projects viz. net present value, benefit cost ratio, internal rate of return, Risk cost management, main causes of project failure. Categories of construction projects, objectives, project development process, Functions of project management, Project management organization and staffing, Stages and steps involved in project planning, Plan development process, objectives ofconstruction project management.	7
3	**PROJECT SCHEDULING:** Importance of project scheduling, project work breakdown process – determining activities involved, work breakdown structure, assessing activity duration, duration estimate procedure, Project work scheduling, Sequence of construction activities, Project management techniques – CPM and PERT networks analysis, concept of precedence network analysis.	8
4	**PROJECT COST AND TIME CONTROL:** Monitoring the time progress and cost controlling measures in a construction project, Time cost trade-off process: direct and indirect project costs, cost slope, Process of crashing of activities, determination of the optimum duration of a project, updating of project networks, resources allocation.	8
5	**CONTRACT MANAGEMENT:** Elements of tender operation, Types of tenders and contracts, Contract document, Legal aspects of contracts, Contract negotiation & award of work, breach of contract, determination of a contract, arbitration.	8
6	**SAFETY AND OTHER ASPECTS OF CONSTRUCTION MANAGEMENT:** Safety measures to be followed in various construction works like excavation, demolition of structures, explosive handling, hot bitumen work. Project Management Information System – Concept, frame work, benefits of computerized information system. Environmental and social aspects ofvarious types of construction projects.	8
	Total	40

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	Recommended Texts:
1	Construction Planning & management By P S Gahlot& B M Dhir, New Age International Limited Publishers
2	Construction Project planning & Scheduling by Charles Patrick, Pearson, 2012
3	Construction Project Management Theory & practice --- Kumar Neeraj Jha, Pearson, 2012
4	Modern construction management--Harris, Wiley India.
5	Construction Management & Planning by Sengupta and Guha-Tata McGraw Hill publication.
6	Project Management – K Nagrajan – New age International Ltd.
7	Professional Construction Institute Edition.
8	Construction Project Management Planning, Scheduling and Controlling-Chitakara- Tata McGraw Hill, New Delhi
9	Construction Planning, Equipment and Methods by R. L. Peurify

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8CE4-21: Project Planning and Construction Management Lab

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**

0L+0T+2P

1. Assignments on net present value, benefit cost ratio, internal rate ofreturn
2. Types of contracts – Tenders, tender form, submission and opening of tenders, measurement book, muster roll, piecework agreement and work order.
3. Drafting of tender documents, special terms andconditions
4. Drafting of tender notices for different types ofworks
5. Different models of PPP like BOT, BOOTetc.
6. Arbitration
7. Preparation of bardiagram
8. Network Analysis using PERT andCPM

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8CE4-22: Pavement Design

Credit 1 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P

1. **Pavement Mix Analysis**: Aggregate blending, bituminous mix design – Marshall Stability approach, concrete mix design for DLC and PQC with IS codeprovisions.
2. **Pavement Basics:** Types & comparison, vehicular loading pattern, factors affecting design and performance of pavements, sub graderequirements.
3. **Design of Flexible Pavements**: Analytical approach, flexible pavement layers, ESWL, repetitions of load, techniques of design methods, wheel load analysis, traffic analysis, stress distribution in subgrade soil, Burmister's theories, group index method, CBR approach, IRC 37 and otherguidelines.
4. **Design of Concrete Pavements**: Westergaard's approach, temperature & frictional stresses, design of expansion & longitudinal joints, design of dowel & tie bars, IRC 58 and otherguidelines.
5. **Specifications for rural roads:** Important aspects of IRC SP 020, Rural Road Manual. NRRDA publications

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Scheme of

UNDERGRADUATE DEGREE COURSE

B.Tech. V & VI Semester

Civil Engineering

Rajasthan Technical University, Kota

Effective from session: 2019-20

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Civil Engineering
3rd Year –V Semester

SN	Category	Course Code	Course Title	Contact hrs/week L	T	P	Marks Exm Hrs	IA	ETE	Total	Cr
THEORY											
1	ESC	5CE3-01	Construction Technology & Equipments	2	0	0	2	20	80	**100**	**2**
2	PCC/ PEC	5CE4-02	Structural Analysis-I	2	0	0	2	20	80	**100**	**2**
3		5CE4-03	Design of Concrete Structures	3	0	0	3	30	120	**150**	**3**
4		5CE4-04	Geotechnical Engineering	3	0	0	3	30	120	**150**	**3**
5		5CE4-05	Water Resource Engineering	2	0	0	2	20	80	**100**	**2**
6		Departmental Elective-I:		2	0	0	2	20	80	**100**	**2**
		5CE5-11	Air & Noise Pollution and Control								
		5CE5-12	Disaster Management								
		5CE5-13	Town Planning								
7		Departmental Elective-II:		2	0	0	2	20	80	**100**	**2**
		5CE5-14	Repair and Rehabilitation of Structures								
		5CE5-15	Ground Improvement Techniques								
		5CE5-16	Energy Science & Engineering								
		Sub Total		**16**	**0**	**0**		**160**	**640**	**800**	**16**
PRACTICAL & SESSIONAL											
8	PCC	5CE4-21	Concrete Structures Design	0	0	3	3	45	30	**75**	**1.5**
9		5CE4-22	Geotechnical Engineering Lab	0	0	3	3	45	30	**75**	**1.5**
10		5CE4-23	Water Resource Engineering Design	0	0	2	2	30	20	**50**	**1**
11	PSIT	5CE7-30	Industrial Training	0	0	1		75	50	**125**	**2.5**
12	SODECA	5CE8-00	Social Outreach, Discipline & Extra Curricular Activities	0	0	0		0	25	**25**	**0.5**
		Sub- Total		**0**	**0**	**9**		**195**	**155**	**350**	**7**
		TOTAL OF V SEMESTER		**16**	**0**	**9**		**355**	**795**	**1150**	**23**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*
ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B. Tech.: Civil Engineering
3rd Year – VI Semester

SN	Category	Course Code	Course Title	Contact hrs/week L	T	P	Marks Exm Hrs	IA	ETE	Total	Cr
THEORY											
1	ESC	6CE3-01	Wind & Seismic Analysis	2	0	0	2	20	80	**100**	**2**
2	PCC/ PEC	6CE4-02	Structural Analysis-II	3	0	0	3	30	120	**150**	**3**
3		6CE4-03	Environmental Engineering	3	0	0	3	30	120	**150**	**3**
4		6CE4-04	Design of Steel Structures	3	0	0	3	30	120	**150**	**3**
5		6CE4-05	Estimating & Costing	2	0	0	2	20	80	**100**	**2**
6		Departmental Elective-III:		2	0	0	2	20	80	**100**	**2**
		6CE5-11	Pre-stressed Concrete								
		6CE5-12	Solid and Hazardous Waste Management								
		6CE5-13	Traffic Engineering and Management								
7		Departmental Elective-IV:		2	0	0	2	20	80	**100**	**2**
		6CE5-14	1. Bridge Engineering								
		6CE5-15	2. Rock Engineering								
		6CE5-16	3. Geographic Information System & Remote Sensing								
		Sub Total		**17**	**0**	**0**		**170**	**680**	**850**	**17**
PRACTICAL & SESSIONAL											
8	PCC	6CE4-21	Environmental Engineering Design and Lab	0	0	3	3	45	30	**75**	**1.5**
9		6CE4-22	Steel Structure Design	0	0	3	3	45	30	**75**	**1.5**
10		6CE4-23	Quantity Surveying and Valuation	0	0	2	2	30	20	**50**	**1**
11		6CE4-24	Water and Earth Retaining Structures Design	0	0	2	2	30	20	**50**	**1**
12		6CE4-25	Foundation Design	0	0	2	2	30	20	**50**	**1**
13	SODECA	6CE8-00	Social Outreach, Discipline & Extra Curricular Activities						25	**25**	**0.5**
		Sub- Total		**0**	**0**	**12**		**180**	**145**	**325**	**6.5**
		TOTAL OF VI SEMESTER		**17**	**0**	**12**		**350**	**825**	**1175**	**23.5**

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ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
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Scheme & Syllabus of

UNDERGRADUATE DEGREE COURSE

B.Tech. VII & VIII Semester

Electronics & Communication Engineering

Rajasthan Technical University, Kota

Effective from session: 2020 – 2021

Teaching & Examination Scheme
B.Tech. : Electronics & Communication Engineering
4th Year - VII Semester

SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
THEORY											
1	PEC	Program Elective		3	0	0	3	30	120	**150**	**3**
		7EC5-11	VLSI Design								
		7EC5-12	Mixed Signal Design								
		7EC5-13	CMOS design								
2	OE		Open Elective-I	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	7EC4-21	VLSI Design Lab	0	0	4	2	60	40	**100**	**2**
4		7EC4-22	Advance communication lab (MATLAB Simulation)	0	0	2	2	30	20	**50**	**1**
5		7EC4-23	Optical Communication Lab	0	0	2	2	30	20	**50**	**1**
6	PSIT	7EC7-30	Industrial Training	1	0	0		75	50	**125**	**2.5**
7		7EC7-40	Seminar	2	0	0		60	40	**100**	**2**
8	SODECA	7EC8-00	Social Outreach, Discipline & Extra Curricular Activities					0	25	**25**	**0.5**
			Sub Total	**3**	**0**	**8**		**255**	**195**	**450**	**9**
			TOTAL of VII SEMESTER	**9**	**0**	**8**		**315**	**435**	**750**	**15**

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Teaching & Examination Scheme
B.Tech. : Electronics & Communication Engineering
4th Year - VIII Semester

THEORY												
SN	**Category**	**Course Code**	**Course Title**	**Contact hrs/week**			**Marks**				**Cr**
				L	**T**	**P**	**Exm Hrs**	**IA**	**ETE**	**Total**	
1	PEC		Program Elective	3	0	0	3	30	120	**150**	**3**
		8EC5-11	Artificial Intelligence And Expert Systems								
		8EC5-12	Digital Image and Video Processing								
		8EC5-13	Adaptive Signal Processing								
2	OE		Open Elective-II	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	8EC4-21	Internet of Things (IOT) Lab	0	0	2	2	30	20	**50**	**1**
4		8EC4-22	Skill Development Lab	0	0	2	2	30	20	**50**	**1**
5	PSIT	8EC7-50	Project	3	0	0		210	140	**350**	**7**
6	SODECA	8EC8-00	Social Outreach, Discipline & Extra Curricular Activities						25	**25**	**0.5**
			Sub Total	**3**	**0**	**4**		**270**	**205**	**475**	**9.5**
			TOTAL of VIII SEMESTER	**9**	**0**	**4**		**330**	**445**	**775**	**15.5**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*

ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

List of Open Electives for Electronics & Communication Engineering

Subject Code	Title	Subject Code	Title
Open Elective - I		**Open Elective - II**	
7AG6-60.1	Human Engineering and Safety	8AG6-60.1	Energy Management
7AG6-60.2	Environmental Engineering and Disaster Management	8AG6-60.2	Waste and By-product Utilization
7AN6-60.1	Aircraft Avionic System	8AN6-60.1	Finite Element Methods
7AN6-60.2	Non-Destructive Testing	8AN6-60.2	Factor of Human Interactions
7CH6-60.1	Optimization Techniques	8CH6-60.1	Refinery Engineering Design
7CH6-60.2	Sustainable Engineering	8CH6-60.2	Fertilizer Technology
7CR6-60.1	Introduction to Ceramic Science & Technology	8CR6-60.1	Electrical and Electronic Ceramics
7CR6-60.2	Plant, Equipment and Furnace Design	8CR6-60.2	Biomaterials
7CE6-60.1	Environmental Impact Analysis	8CE6-60.1	Composite Materials
7CE6-60.2	Disaster Management	8CE6-60.2	Fire and Safety Engineering
7CS6-60.1	Quality Management/ISO 9000	8CS6-60.1	Big Data Analytics
7CS6-60.2	Cyber Security	8CS6-60.2	IPR, Copyright and Cyber Law of India
7EE6-60.1	Electrical Machines and Drives	8EE6-60.1	Energy Audit and Demand side Management
7EE6-60.2	Power Generation Sources.	8EE6-60.2	Soft Computing
7ME6-60.1	Finite Element Analysis	8ME6-60.1	Operations Research
7ME6-60.2	Quality Management	8ME6-60.2	Simulation Modeling and Analysis
7MI6-60.1	Rock Engineering	8MI6-60.1	Experimental Stress Analysis
7MI6-60.2	Mineral Processing	8MI6-60.2	Maintenance Management
7PE6-60.1	Pipeline Engineering	8PE6-60.1	Unconventional Hydrocarbon Resources
7PE6-60.2	Water Pollution control Engineering	8PE6-60.2	Energy Management & Policy
7TT6-60.1	Technical Textiles	8TT6-60.1	Material and Human Resource Management
7TT6-60.2	Garment Manufacturing Technology	8TT6-60.2	Disaster Management

7EC5-11: VLSI Design (program elective-3)

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	01
2	INTRODUCTION TO MOSFET- Basic MOS transistors, Enhancement Mode transistor action, Depletion Mode transistor action, NMOS and CMOS fabrication. Aspects of threshold voltage, threshold voltage with body effect. I_{ds} versus V_{ds} relationship, channel length modulation. Transistor Trans-conductance g_m. MOS transistor circuit Model, Model parameter (oxide and junction capacitor, channel resistance) variation with scaling and biasing. High order effects (i.e. sub threshold conduction, hot electron effect, narrow channel effect and punch through effect.	12
3	CMOS LOGIC CIRCUITS- NMOS inverter (resistive and active load), Pull up to Pull-down ratio(β_p/β_n) for a NMOS Inverter and CMOS Inverter, determination of inverter parameter (VIL, VIH VOL VOH) and Noise Margin. Speed and power dissipation analysis of CMOS inverter. Combinational Logic, NAND Gate, NOR gate, XOR gate, Compound Gates, 2 input CMOS Multiplexer, Memory latches and registers, Transmission Gate (TG), estimation of Gate delays, Power dissipation and Transistor sizing. Basic physical design of simple Gates and Layout issues. Layout issues for CMOS inverter, Layout for NAND, NOR and Complex Logic gates, Layout of TG, Layout optimization using Eular path. DRC rules for layout and issues of interconnects, Latch up problem.	11
4	Dynamic CMOS circuits- Clocked CMOS (C^2MOS) logic, DOMINO logic, NORA logic, NP(ZIPPER) logic, PE (pre-charge and Evaluation) Logic. Basic Memory circuits, SRAM and DRAM.	08
5	Physical Design- Introduction to ECAD tools for front and back end design of VLSI circuits. Custom /ASIC design, Design using FPGA and VHDL. VHDL Code for simple Logic gates, flip-flops, shift registers.	08
	Total	40

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Text/Reference Books:	
1	Cmos Digital Integrated Circuits Analysis And Design. Sung-Mo (Steve) Kang, Yusuf Leblebigi, McGraw Hill (2008)
2	N.Weste and K. Eshraghian, Principles of CMOS VLSI, 2e, Pearson Education, 2011
3	VLSI Design, P PSahu , , McGraw, 2013
4	VLSI Design, D.P. Das, Oxford, 2011
5	Chip Design for Submicron VLSI: CMOS Layout & Simulation, Uyemura, cengage learning, 2009

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7EC5-12: Mixed Signal Design(program elective-3)

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	01
2	Analog and discrete-time signal processing, introduction to sampling theory; Analog continuous time filters: passive and active filters; Basics of analog discrete-time filters and Z-transform.	10
3	Basic logic gates with BJT and MOSFET combination, Switched-capacitor filters- Non idealities in switched-capacitor filters; Switched-capacitor filter architectures; Switched-capacitor filter applications.	07
4	Basics of data converters; Successive approximation ADCs, Dual slope ADCs, Flash ADCs, Pipeline ADCs, Hybrid ADC structures, High-resolution ADCs, DACs.	08
5	Mixed-signal layout, Interconnects and data transmission; Voltage-mode signal aligned data transmission; Current-mode signaling and data transmission.	08
6	Introduction to frequency synthesizers and synchronization; Basics of PLL, Analog PLLs; Digital PLLs; DLLs	06
	Total	40

Text/Reference Books:	
1.	R. Jacob Baker, CMOS mixed-signal circuit design, Wiley India, IEEE press, reprint 2008.
2.	Behzad Razavi, Design of analog CMOS integrated circuits, McGraw-Hill, 2003.
3.	R. Jacob Baker, CMOS circuit design, layout and simulation, Revised second edition, IEEE press, 2008.
4.	Rudy V. de Plassche, CMOS Integrated ADCs and DACs, Springer, Indian edition, 2005.
5.	Arthur B. Williams, Electronic Filter Design Handbook, McGraw-Hill, 1981.
6.	R. Schauman, Design of analog filters by, Prentice-Hall 1990 (or newer additions).
7.	M. Burns et al., An introduction to mixed-signal IC test and measurement by, Oxford university press, first Indian edition, 2008.

7EC5-13: CMOS Design (program elective-3)

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	01
2	Review of MOS transistor models, Non-ideal behavior of the MOS Transistor, Transistor as a switch, Inverter characteristics	08
3	Integrated Circuit Layout: Design Rules, Parasitic, Delay: RC Delay model, linear delay model, logical path efforts, Power, interconnect and Robustness in CMOS circuit layout	07
4	Combinational Circuit Design: CMOS logic families including static, dynamic and dual rail logic. NAND Gate, NOR gate, XOR gate, Compound Gates, 2 input CMOS Multiplexer, Memory latches and registers, Transmission Gate, estimation of Gate delays, Power dissipation and Transistor sizing. Basic physical design of simple Gates and Layout issues. Layout issues for CMOS inverter, Layout for NAND, NOR and Complex Logic gates,	10
5	Dynamic CMOS circuits- Clocked CMOS (C^2MOS) logic, DOMINO logic, NORA logic, NP(ZIPPER) logic, PE (pre-charge and Evaluation) Logic. Basic Memory circuits, SRAM and DRAM.	08
6	Physical Design- Introduction to ECAD tools for first and back end design of VLSI circuits. Custom /ASIC design, Design using FPGA and VHDL. VHDL Code for simple Logic gates, flip-flops, shift registers.	06
	Total	40

Text/Reference Books:

1.	N.H.E. Weste and D.M. Harris, CMOS VLSI design: A Circuits and Systems Perspective, 4thEdition, Pearson Education India, 2011.
2.	Sung-Mo-Kang and Yusuf Leblebici, CMOS Digital Integrated Circuits Analysis &Design, McGraw Hill
3.	C.Mead and L. Conway, Introduction to VLSI Systems, Addison Wesley, 1979.
4.	J. Rabaey, Digital Integrated Circuits: A Design Perspective, Prentice Hall India, 1997.
5.	P. Douglas, VHDL: programming by example, McGraw Hill, 2013.
6.	L. Glaser and D. Dobberpuhl, The Design and Analysis of VLSI Circuits, Addison Wesley, 1985.

7EC4-21: VLSI Design Lab

Credit: **Max. Marks: 100(IA:60, ETE:40)**

0L+0T+4P

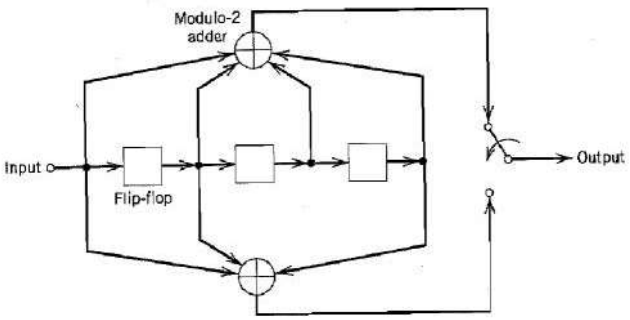
SN	Contents
1	Introduction: Objective, scope and outcome of the course.
PART-A	Step1 Write the VHDL/Verilog code using VHDL software for following experiment and simulate them. Step 2. Burn the Written code in Xilling Board and test the output with real input signal
1	Design and simulate all the logic gates with 2 inputs using VHDL/Verilog.
2	Design and simulate 2-to-4 decoder,3-to-8 encoder and 8X1 multiplexer using VHDL/Verilog.
3	Design and simulate half adder and full adder using VHDL (data flow method)/Verilog.
4	Design and simulate D, T and J-K flip flop using VHDL/Verilog.
5	Design a 4bit binary Asynchronous and synchronous counter. Obtain its number of gates, area, and speed and power dissipation.
6	Design a 4- bit Serial in-serial out shift register. Obtain its number of gates, area, and speed and power dissipation.
PART-B	Step-1 Design and simulate following experiment using ECAD software Viz. Mentor graphics, Orcade Pspice, Cadence etc. Step-2 Draw the layout (without any DRC error)of the schematic obtain in step 1 and obtain post layout simulation using appropriate ECAD software.
1	Design and simulate all the logic gates (NOT, NAND and NOR) with 2 inputs in CMOS Technology.
2	Design and simulate Y = AB (C+D), Y = A+B(C+D) and 4X1 multiplexer using CMOS Technology.
3	Design and simulate half adder and full adder using CMOS Technology.
4	Design and simulate SR flip flop using CMOS Technology.
5	Design and Simulate any DRAM cell.

7EC4-22: Advance Communication Lab (MATLAB Simulation)

Credit: 1 **Max. Marks: 50 (IA:30, ETE:20)**

0L+0T+2P

SN	Contents
1	Introduction: Objective, scope and outcome of the course.
Part-A	**Analog-to-digital conversion** 1. Generate a sinusoidal signal. Sample and reconstruct a signal through interpolation. Vary the sampling rate below and above the Nyquist rate and hence verify the Sampling theorem. 2. Generate a sequence of length 500 of zero-mean, unit variance Gaussian random variables. Using a uniform PCM scheme, quantize this sequence to 16, 64 and 128 levels. (a). Find and compare the resulting signal-to-quantization noise ratios. (b). Find the first ten values of the sequence, the corresponding quantized values and the corresponding code words for each case. (c). Plot the quantization error and the quantized value as a function of the input value for each case. **Digital modulation techniques** 3. Simulate the transmitter and receiver for QPSK. Plot the signal and signal constellation diagram. Plot the average probability of symbol error as a function of SNR E_b/N_o, where E_b is the transmitted energy per bit and $N_o/2$ is the double sided power spectral density of additive white Gaussian noise (AWGN) with zero mean. 4. Simulate the transmitter and receiver for 16-QAM. Plot the signal and signal constellation diagram.Plot the average probability of symbol error as a function of SNR E_b/N_o, where E_b is the transmitted energy per bit and $N_o/2$ is the double sided power spectral density of additive white Gaussian noise (AWGN) with zero mean.
PART-B Attempt any four experiment	1. Find all the code words of the (15,11) Hamming code and verify that its minimum distance is equal to 3. 2. Generate an equiprobable random binary information sequence of length 15. Determine the output of the convolutional encoder shown below for this sequence.



3. Generate the L=31 Gold sequences. Consider a time-synchronous CDMA system (direct sequence spread spectrum) having four users, each employing a distinct Gold sequence of length L=31 and the binary (±1) modulation of their representative Gold sequences. The receiver for each user correlates the composite CDMA received signal, which is corrupted by AWGN (added on a chip-by-chip basis) with each user's respective sequence. Using 10000 information bits, estimate and plot the probability of error for each user as a function of SNR.
4. Consider a MIMO (multiple-input, multiple-output) system with $N_T = 2$ transmit antennas and NR = 2 receive antennas. Generate the elements of the channel matrix **H** for a Rayleigh fading (frequency nonselective) AWGN channel and the corresponding inputs to the detectors for the two receive antennas.
5. Perform feature extraction from a given Image and use Principal Components as image descriptors.
6. By using an image dataset, train a Neural Network to recognize a given Image. Apply this in context to face/object recognition and calculate recognition accuracy of the training set.
7. Develop a Fuzzy Inference System (FIS) by using a set of fuzzy rule base between some key image parameters and calculate output after defuzzification.
8. Design a Fuzzy PID controller using Matlab for a Dc Motor.
9. Classify ECG signals using Neural networks.

7EC4-23: Optical Communication Lab

Credit: 1 **Max. Marks: 50 (IA:30, ETE:20)**

0L+0T+2P

SN	Contents
1	Introduction: Objective, scope and outcome of the course.
	Hardware based experiment;
1	To set up Fiber Optic Analog and fiber Optic Digital link.
2	Measurement of Propagation loss and numerical aperture.
3	Measurement of optical power bending loss in a plastic optical fiber.
4	Study and measure characteristics of fiber optic LED's, LDR and Laser diode.
5	OTDR Measurement of Fiber Length, Attenuation and Dispersion Loss.
	Software based experiment;
6	Design and simulate of single and multimode transmission in optical fiber system.
7	Show and simulate the optical system performance analysis using Eye diagram and measure the value of Q-factor & BER of optical signals.
8	Study and simulate the linear and parabolic waveguide structure use in optical fiber communication.
9	Design and simulate the Dispersion compensators for fiber optic communication.
10	Design and calculate the power budget for optical communication link.
11	Design and simulate the DWDM and WDM techniques use in optical communication.
12	Design and simulate the Fiber Bragg grating and find its transmission characteristics and optical band-gap.

8EC5-11: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS
(program elective-4)

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	01
2	**Introduction to Artificial Intelligence:** Intelligent Agents, State Space Search, Uninformed Search, Informed Search, Two Players Games, Constraint Satisfaction Problems.	08
3	**Knowledge Representation:** Knowledge Representation And Logic, Interface in Propositional Logic, First Order Logic, Reasoning Using First Order Logic, Resolution in FOPL.	07
4	**KNOWLEDGE ORGANIZATION:** Rule based System, Semantic Net, Reasoning in Semantic Net Frames, Planning	08
5	**KNOWLEDGE SYSTEMS:** Rule Based Expert System, Reasoning with Uncertainty, Fuzzy Reasoning.	08
6	**KNOWLEDGE ACQUISITION:** Introduction to Learning, Rule Induction and Decision Trees, Learning Using neural Networks, Probabilistic Learning Natural Language Processing.	08
	Total	40

Text/Reference Books:

1.	Elaine Rich and Kevin Knight, Artificial Intelligence 3/e, TMH (1991)
2.	PADHY: ARTIFICIAL INTELLIGENCE & INTELLIGENT SYSTEMS, Oxford (2005)
3.	James A Anderson, An introduction to Neural Networks. Bradford Books 1995
4.	Dan. W Patterson, Artificial Intelligence and Expert Systems, PHI 1990
5.	Kumar Satish, “Neural Networks” Tata Mc Graw Hill 2004
6.	S. Rajsekaran& G.A. Vijayalakshmi Pai, “Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis and Applications” Prentice Hall of India. 2006
7.	SimanHaykin, “Neural Netowrks” Prentice Hall of India 1990
8.	Artificial Intelligence, Kaushik, cengage learning 1997

8EC5-12: Digital Image and Video Processing (program elective-4)

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	01
2	Digital Image Fundamentals-Elements of visual perception, image sensing and acquisition, image sampling and quantization, basic relationships between pixels neighborhood, adjacency, connectivity, distance measures.	04
3	Image Enhancements and Filtering-Gray level transformations, histogram equalization and specifications, pixel-domain smoothing filters – linear and order-statistics, pixel-domain sharpening filters – first and second derivative, two-dimensional DFT and its inverse, frequency domain filters – low-pass and high-pass.	03
4	Color Image Processing-Color models–RGB, YUV, HSI; Color transformations-formulation, color complements, color slicing, tone and color corrections; Color image smoothing and sharpening; Color Segmentation.	04
5	Image Segmentation- Detection of discontinuities, edge linking and boundary detection, Thresholding – global and adaptive, region-based segmentation.	04
6	Wavelets and Multi-resolution image processing- Uncertainty principles of Fourier Transform, Time-frequency localization, continuous wavelet transforms, wavelet bases and multi-resolution analysis, wavelets and Sub-band filter banks, wavelet packets.	06
7	Image Compression-Redundancy–inter-pixel and psycho-visual; Lossless compression – predictive, entropy; Lossy compression-predictive and transform coding; Discrete Cosine Transform; Still image compression standards – JPEG and JPEG-2000.	06
8	Fundamentals of Video Coding- Inter-frame redundancy, motion estimation techniques – full search, fast search strategies, forward and backward motion prediction, frame classification – I, P and B; Video sequence hierarchy – Group of pictures, frames, slices, macro-blocks and blocks; Elements of a video encoder and decoder; Video coding standards – MPEG and H.26X.	06
9	Video Segmentation- Temporal segmentation–shot boundary detection, hard-cuts and soft-cuts; spatial segmentation – motion-based; Video object detection and tracking.	06
	Total	40

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Text/Reference Books:	
1.	R.C. Gonzalez and R.E. Woods, Digital Image Processing, Second Edition, Pearson Education 3rd edition 2008
2	R.C. Gonzalez, R.E. Woods and S.L. Eddins, Digital Image Processing using Matlab, McGraw Hill,2nd Edition
3.	Anil Kumar Jain, Fundamentals of Digital Image Processing, Prentice Hall of India.2nd edition 2004
4.	Murat Tekalp , Digital Video Processing" Prentice Hall, 2nd edition 2015

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8EC5-13: Adaptive Signal Processing (program elective-4)

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**

3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	01
2	General concept of adaptive filtering and estimation, applications and motivation, Review of probability, random variables and stationary random processes, Correlation structures, properties of correlation matrices.	08
3	Optimal FIR (Wiener) filter, Method of steepest descent, extension to complex valued The LMS algorithm (real, complex), convergence analysis, weight error correlation matrix, excess mean square error and mis-adjustment Variants of the LMS algorithm: the sign LMS family, normalized LMS algorithm, block LMS and FFT based realization, frequency domain adaptive filters, Sub-band adaptive filtering.	07
4	Signal space concepts - introduction to finite dimensional vector space theory, subspace, basis, dimension, linear operators, rank and nullity, inner product space, orthogonality, Gram-Schmidt orthogonalization, concepts of orthogonal projection, orthogonal decomposition of vector spaces.	08
5	Vector space of random variables, correlation as inner product, forward and backward projections, Stochastic lattice filters, recursive updating of forward and backward prediction errors, relationship with AR modeling, joint process estimator, gradient adaptive lattice.	08
6	Introduction to recursive least squares (RLS), vector space formulation of RLS estimation, pseudo-inverse of a matrix, time updating of inner products, development of RLS lattice filters, RLS transversal adaptive filters. Advanced topics: affine projection and subspace based adaptive filters, partial update algorithms, QR decomposition and systolic array.	08
	Total	40

Text/Reference Books:	
1.	S. Haykin, Adaptive filter theory, Prentice Hall, 1986.
2.	C.Widrow and S.D. Stearns, Adaptive signal processing, Prentice Hall, 1984.

8EC4-21: IOT Lab

Credit: 1 **Max. Marks: 50 (IA:30, ETE:20)**

0L+0T+2P

	LIST OF PRACTICALS
1.	Study the fundamental of IOT softwares and components.
2.	Familiarization with Arduino/Raspberry Pi and perform necessary software installation.
3.	To interface LED/Buzzer with Arduino/Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds.
4.	To interface Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed or at sensor detection.
5.	To interface DHT11 sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings.
6.	To interface motor using relay with Arduino/Raspberry Pi and write a program to turn ON motor when push button is pressed.
7.	To interface OLED with Arduino/Raspberry Pi and write a program to print temperature and humidity readings on it.
8.	To interface Bluetooth with Arduino/Raspberry Pi and write a program to send sensor data to smartphone using Bluetooth.
9.	To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED ON/OFF when '1'/'0' is received from smartphone using Bluetooth.
10	Write a program on Arduino/Raspberry Pi to upload temperature and humidity data to thingspeak cloud.
11.	Write a program on Arduino/Raspberry Pi to retrieve temperature and humidity data from thingspeak cloud.
12.	To install MySQL database on Raspberry Pi and perform basic SQL queries.
13.	Write a program to create UDP server on Arduino/Raspberry Pi and respond with humidity data to UDP client when requested.
14.	Write a program to create TCP server on Arduino/Raspberry Pi and respond with humidity data to TCP client when requested.

	LIST OF SUGGESTED BOOKS:
1.	Vijay Madisetti, Arshdeep Bahga, Ïnternet of Things, "A Hands on Approach", University Press.
2.	Dr. SRN Reddy, Rachit Thukral and Manasi Mishra, "Introduction to Internet of Things: A practical Approach", ETI Labs.
3.	Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press
4.	Jeeva Jose, "Internet of Things", Khanna Publishing House, Delhi
5.	Adrian McEwen, "Designing the Internet of Things", Wiley
6.	Raj Kamal, "Internet of Things: Architecture and Design", McGraw Hill

8EC4- 22 Skill Development Lab

Credit: 1 **Max. Marks : 50 (IA:30,ETE:20)**

0L+0T+2P

Part A: Training	
SN	**Contents**
1	Introduction: Objective, scope and outcome of the lab.
	Every student has to learn any two software from the following list, with consultation of their lab in charge. Students may get online certification or is advised to learn these from available freeware. Students may register online training courses from institutes of repute i.e. IITs/NITs/AICTE/MHRD, etc. Industrial experts /professional may be deputed to train the students in department.
1	Network simulator (NS_2)
2	Lab view
3	Software for Robotics/Artificial intelligence (AI) /machine learning
4	Java
5	Python

PART B: Implementation	
SN	**Contents**
1	**Student has to complete any one assignment with detailed project report based on the software/tool learn in part A.**
2	Student cab select any Social engineering project: Any problem of the society can be taken which can be solved with the help of electronics engineering software and gadgets.
3	Student can select Startup for innovation/entrepreneurship.
4	Engineering solution of any Industrial problem. Sufficient number of such problem may be identified by the department from nearby industry and may be given to the student for innovative solutions under guidance of faculty.
	This lab may be evaluated by an external examiner from industry along with internal faculty.

Scheme of

UNDERGRADUATE DEGREE COURSE

B.Tech. V & VI Semester

Electronics & Communication Engineering

Rajasthan Technical University, Kota

Effective from session: 2019-20

Teaching & Examination Scheme
B.Tech. : Electronics & Communication Engineering
3rd Year –V Semester

THEORY												
SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
1	ESC	5EC 3-01	Computer Architecture	2	0	0	2	20	80	**100**	**2**
2	PCC/ PEC	5EC 4-02	Electromagnetics Waves	3	0	0	3	30	120	**150**	**3**
3		5EC 4-03	Control system	3	0	0	3	30	120	**150**	**3**
4		5EC 4-04	Digital Signal Processing	3	0	0	3	30	120	**150**	**3**
5		5EC 4-05	Microwave Theory & Techniques	3	0	0	3	30	120	**150**	**3**
6		Professional Elective I (any one)		2	0	0	2	20	80	**100**	**2**
		5EC 5-11	Bio-Medical Electronics								
		5EC 5-12	Embedded Systems								
		5EC 5-13	Probability Theory & Stochastic Process								
		5EC 5-14	Satellite Communication								
		Sub Total		**16**	**0**	**0**		**160**	**640**	**800**	**16**
PRACTICAL & SESSIONAL											
7	PCC	5EC 4-21	RF Simulation Lab	0	0	3	2	45	30	**75**	**1.5**
8		5EC 4-22	Digital Signal Processing Lab	0	0	3	2	45	30	**75**	**1.5**
9		5EC 4-23	Microwave Lab	0	0	2	2	30	20	**50**	**1**
10	PSIT	5EC 7-30	Industrial Training	0	0	1		75	50	**125**	**2.5**
11	SODECA	5EC 8-00	Social Outreach, Discipline & Extra Curricular Activities	0	0	0			25	**25**	**0.5**
		Sub- Total		**0**	**0**	**9**		**195**	**155**	**350**	**7**
		TOTAL OF V SEMESTER		**16**	**0**	**9**		**355**	**795**	**1150**	**23**

L: Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credits

ETE: End Term Exam, **IA:** Internal Assessment

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Teaching & Examination Scheme
B. Tech.: Electronics & Communication Engineering
3rd Year – VI Semester

THEORY												
SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
1	ESC	6EC 3-01	Power Electronics	2	0	0	2	20	80	**100**	**2**
2	PCC/ PEC	6EC 4-02	Computer Network	3	0	0	3	30	120	**150**	**3**
3		6EC 4-03	Fiber Optics Communications	3	0	0	3	30	120	**150**	**3**
4		6EC 4-04	Antennas and Propagation	3	0	0	3	30	120	**150**	**3**
5		6EC 4-05	Information theory and coding	3	0	0	3	30	120	**150**	**3**
6		Professional Elective II (any one)		3	0	0	3	30	120	**150**	**3**
		6EC 5-11	Introduction to MEMS								
		6EC 5-12	Nano Electronics								
		6EC 5-13	Neural Network And Fuzzy Logic Control								
		6EC 5-14	High Speed Electronics								
		Sub Total		**17**	**0**	**0**		**170**	**680**	**850**	**17**
PRACTICAL & SESSIONAL											
7	PCC	6EC 4-21	Computer Network Lab	0	0	4	2	60	40	**100**	**2**
8		6EC 4-22	Antenna and wave propagation Lab	0	0	2	2	30	20	**50**	**1**
9		6EC 4-23	Electronics Design Lab	0	0	4	2	60	40	**100**	**2**
10		6EC 4-24	Power Electronics Lab	0	0	2	2	30	20	**50**	**1**
11	SODECA	6EC 8-00	Social Outreach, Discipline & Extra Curricular Activities	0	0	0			25	**25**	**0.5**
		Sub- Total		**0**	**0**	**12**		**180**	**145**	**325**	**6.5**
		TOTAL OF VI SEMESTER		**17**	**0**	**12**		**350**	**825**	**1175**	**23.5**

L: Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credits

ETE: End Term Exam, **IA:** Internal Assessment

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Scheme & Syllabus of
UNDERGRADUATE DEGREE COURSE

B.Tech. VII & VIII Semester

Electrical Engineering

Rajasthan Technical University, Kota
Effective from session: 2020-21

Teaching & Examination Scheme
B. Tech.: Electrical Engineering
4th Year - VII Semester

SN	Course Type	Course		Hours per Week			Marks				Cr
		Code	Name	L	T	P	Exm Hrs	IA	ETE	Total	
1	PEC	7EE5-11	Wind and Solar Energy Systems.	3	0	0	3	30	120	**150**	**3**
2		7EE5-12	Power Quality and FACTS								
3		7EE5-13	Control System Design.								
4	OE		Open Elective-I	3	0	0	3	30	120	**150**	**3**
			SUB TOTAL	**6**	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
5	PCC	7EE4-21	Embedded Systems Lab	0	0	4	2	60	40	**100**	**2**
6	PCC	7EE4-22	Advance control system lab	0	0	4	2	60	40	**100**	**2**
7	PSIT	7EE7-30	Industrial Training	1	0	0		75	50	**125**	**2.5**
8		7EE7-40	Seminar	2	0	0		60	40	**100**	**2**
9	SODE-CA	7EE8-00	Social Outreach, Discipline & Extra Curricular Activities	0	0	0		0	25	**25**	**0.5**
			SUB TOTAL	**3**	**0**	**8**		**255**	**195**	**450**	**6**
			TOTAL OF VII SEMESTER	**9**	**0**	**8**		**315**	**435**	**750**	**15**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*
ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Teaching & Examination Scheme
B. Tech. : Electrical Engineering
4th Year - VIII Semester

THEORY												
SN	**Course Type**	**Course**		**Hours per Week**			**Marks**				**Cr**
		Course Code	**Course Name**	**L**	**T**	**P**	**Exm Hrs**	**IA**	**ETE**	**Total**	
1	PEC	8EE4-11	HVDC Transmission System.	3	0	0	3	30	120	**150**	**3**
2		8EE4-12	Line Commutated and active rectifiers.								
3		8EE4-13	Advanced Electric Drives.								
4	OE		Open Elective-II	3	0	0	3	30	120	**150**	**3**
				6	**0**	**0**		**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
			SUB TOTAL	**6**	**0**	**0**		**60**	**240**	**300**	**6**
5	PCC	8EE4-21	Energy Systems Lab	0	0	4	3	60	40	**100**	**2**
6	PSIT	8EE7-50	Project	3	0	0		210	140	**350**	**7**
7	SODE-CA	8EE8-00	SODECA	0	0	0			25	**25**	**0.5**
			SUB TOTAL	**3**	**0**	**4**		**270**	**205**	**475**	**9.5**
			TOTAL OF VIII SEMESTER	**9**	**0**	**4**		**330**	**445**	**775**	**15.5**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*
ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
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List of Open Electives for Electrical Engineering			
Subject Code	**Title**	**Subject Code**	**Title**
Open Elective - I		**Open Elective - II**	
7AG6-60.1	Human Engineering and Safety	8AG6-60.1	Energy Management
7AG6-60.2	Environmental Engineering and Disaster Management	8AG6-60.2	Waste and By-product Utilization
7AN6-60.1	Aircraft Avionic System	8AN6-60.1	Finite Element Methods
7AN6-60.2	Non-Destructive Testing	8AN6-60.2	Factor of Human Interactions
7CH6-60.1	Optimization Techniques	8CH6-60.1	Refinery Engineering Design
7CH6-60.2	Sustainable Engineering	8CH6-60.2	Fertilizer Technology
7CR6-60.1	Introduction to Ceramic Science & Technology	8CR6-60.1	Electrical and Electronic Ceramics
7CR6-60.2	Plant, Equipment and Furnace Design	8CR6-60.2	Biomaterials
7CE6-60.1	Environmental Impact Analysis	8CE6-60.1	Composite Materials
7CE6-60.2	Disaster Management	8CE6-60.2	Fire and Safety Engineering
7CS6-60.1	Quality Management/ISO 9000	8CS6-60.1	Big Data Analytics
7CS6-60.2	Cyber Security	8CS6-60.2	IPR, Copyright and Cyber Law of India
7EC6-60.1	Principle of Electronic communication	8EC6-60.1	Industrial and Biomedical applications of RF Energy
7EC6-60.2	Micro and Smart System Technology	8EC6-60.2	Robotics and control
7ME6-60.1	Finite Element Analysis	8ME6-60.1	Operations Research
7ME6-60.2	Quality Management	8ME6-60.2	Simulation Modeling and Analysis
7MI6-60.1	Rock Engineering	8MI6-60.1	Experimental Stress Analysis
7MI6-60.2	Mineral Processing	8MI6-60.2	Maintenance Management
7PE6-60.1	Pipeline Engineering	8PE6-60.1	Unconventional Hydrocarbon Resources
7PE6-60.2	Water Pollution control Engineering	8PE6-60.2	Energy Management & Policy
7TT6-60.1	Technical Textiles	8TT6-60.1	Material and Human Resource Management
7TT6-60.2	Garment Manufacturing Technology	8TT6-60.2	Disaster Management

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7EE5-11: WIND AND SOLAR ENERGY SYSTEM

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	CONTENTS	Hours
1	**Introduction:** Objective, scope and outcome of the course.	1
2	**Physics of Wind Power** History of wind power, Indian and Global statistics, Wind physics, Betz limit, Tip speed ratio, stall and pitch control, Wind speed statistics-probability distributions, Wind speed and power-cumulative distribution functions.	5
3	**Wind Generator Topologies** Review of modern wind turbine technologies, Fixed and Variable speed wind turbines, Induction Generators, Doubly-Fed Induction Generators and their characteristics, Permanent Magnet Synchronous Generators, Power electronics converters. Generator-Converter configurations, Converter Control.	11
4	**The Solar Resource** Introduction, solar radiation spectra, solar geometry, Earth Sun angles, observer Sun angles, solar day length, Estimation of solar energy availability.	4
5	**Solar Photovoltaic** Technologies-Amorphous, monocrystalline, polycrystalline; V-I characteristics of a PV cell, PV module, array, Power Electronic Converters for Solar Systems, Maximum Power Point Tracking (MPPT) algorithms. Converter Control.	8
6	**Network Integration Issues** Overview of grid code technical requirements. Fault ride-through for wind farms - real and reactive power regulation, voltage and frequency operating limits, solar PV and wind farm behavior during grid disturbances. Power quality issues. Power system interconnection experiences in the world. Hybrid and isolated operations of solar PV and wind systems.	8
7	**Solar Thermal Power Generation** Technologies, Parabolic trough, central receivers, parabolic dish, Fresnel, solar pond, elementary analysis.	4
	TOTAL	

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Text/Reference Books	
1	T. Ackermann, "Wind Power in Power Systems", John Wiley and Sons Ltd., 2005.
2	G. M. Masters, "Renewable and Efficient Electric Power Systems", John Wiley and Sons, 2004.
3	S. P. Sukhatme, "Solar Energy: Principles of Thermal Collection and Storage", McGraw Hill, 1984.
4	H. Siegfried and R. Waddington, "Grid integration of wind energy conversion systems" John Wiley and Sons Ltd., 2006.
5	G. N. Tiwari and M. K. Ghosal, "Renewable Energy Applications", Narosa Publications, 2004.
6	J. A. Duffie and W. A. Beckman, "Solar Engineering of Thermal Processes", John Wiley & Sons, 1991

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7EE4-12: POWER QUALITY AND FACTS

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	CONTENTS	Hours
1	**Introduction:** Objective, scope and outcome of the course.	01
2	**Transmission Lines and Series/Shunt Reactive Power Compensation** Basics of AC Transmission. Analysis of uncompensated AC transmission lines. Passive Reactive Power Compensation. Shunt and series compensation at the mid-point of an AC line. Comparison of Series and Shunt Compensation	04
3	**Thyristor-based Flexible AC Transmission Controllers (FACTS)** Description and Characteristics of Thyristor-based FACTS devices: Static VAR Compensator (SVC), Thyristor Controlled Series Capacitor (TCSC), Thyristor Controlled Braking Resistor and Single Pole Single Throw (SPST) Switch. Configurations/Modes of Operation, Harmonics and control of SVC and TCSC. Fault Current Limiter.	06
4	**Voltage Source Converter based (FACTS) controllers** Voltage Source Converters (VSC): Six Pulse VSC, Multi-pulse and Multi-level Converters, Pulse-Width Modulation for VSCs. Selective Harmonic Elimination, Sinusoidal PWM and Space Vector Modulation. STATCOM: Principle of Operation, Reactive Power Control: Type I and Type II controllers, Static Synchronous Series Compensator (SSSC) and Unified Power Flow Controller (UPFC): Principle of Operation and Control. Working principle of Interphase Power Flow Controller. Other Devices: GTO Controlled Series Compensator. Fault Current Limiter	08
5	**Application of FACTS** Application of FACTS devices for power-flow control and stability improvement. Simulation example of power swing damping in a single-machine infinite bus system using a TCSC. Simulation example of voltage regulation of transmission mid-point voltage using a STATCOM.	04
6	**Power Quality Problems in Distribution Systems** Power Quality problems in distribution systems: Transient and Steady state variations in voltage and frequency. Unbalance, Sags, Swells, Interruptions, Waveform Distortions: harmonics, noise, notching, dc-offsets, fluctuations. Flicker and its measurement. Tolerance of Equipment: CBEMA curve..	04
7	**DSTATCOM** Reactive Power Compensation, Harmonics and Unbalance mitigation	07

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	in Distribution Systems using DSTATCOM and Shunt Active Filters. Synchronous Reference Frame Extraction of Reference Currents. Current Control Techniques in for DSTATCOM.	
8	**Dynamic Voltage Restorer and Unified Power Quality Conditioner** Voltage Sag/Swell mitigation: Dynamic Voltage Restorer – Working Principle and Control Strategies. Series Active Filtering. Unified Power Quality Conditioner (UPQC): Working Principle. Capabilities and Control Strategies.	**06**
	TOTAL	

Text/Reference Books	
1	N. G. Hingorani and L. Gyugyi, "Understanding FACTS: Concepts and Technology of FACTS Systems", Wiley-IEEE Press, 1999.
2	K. R. Padiyar, "FACTS Controllers in Power Transmission and Distribution", New Age International (P) Ltd. 2007.
3	T. J. E. Miller, "Reactive Power Control in Electric Systems", John Wiley and Sons, New York, 1983.
4	R. C. Dugan, "Electrical Power Systems Quality", McGraw Hill Education, 2012.
5	G. T. Heydt, "Electric Power Quality", Stars in a Circle Publications, 1991

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7EE5-13: CONTROL SYSTEM DESIGN

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	CONTENTS	Hours
1	**Introduction :** Objective, scope and outcome of the course.	1
2	**Design Specifications** Introduction to design problem and philosophy. Introduction to time domain and frequency domain design specification and its physical relevance. Effect of gain on transient and steady state response. Effect of addition of pole on system performance. Effect of addition of zero on system response..	08
3	**Design of Classical Control System in the time domain** Introduction to compensator. Design of Lag, lead lag-lead compensator in time domain. Feedback and Feed forward compensator design. Feedback compensation. Realization of compensators.	07
4	**Design of Classical Control System in frequency domain** Compensator design in frequency domain to improve steady state and transient response. Feedback and Feed forward compensator design using bode diagram.	08
5	**Design of PID controllers** Design of P, PI, PD and PID controllers in time domain and frequency domain for first, second and third order systems. Control loop with auxiliary feedback – Feed forward control	06
6	**Control System Design in state space** Review of state space representation. Concept of controllability & observability, effect of pole zero cancellation on the controllability & observability of the system, pole placement design through state feedback. Ackerman's Formula for feedback gain design. Design of Observer. Reduced order observer. Separation Principle.	08
7	**Nonlinearities and its effect on system performance** Various types of non-linearities. Effect of various non-linearities on system performance. Singular points. Phase plot analysis	03
	TOTAL	

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Text/Reference Books	
1	N. Nise, "Control system Engineering", John Wiley, 2000.
2	I. J. Nagrath and M. Gopal, "Control system engineering", Wiley, 2000.
3	M. Gopal, "Digital Control Engineering", Wiley Eastern, 1988.
4	K. Ogata, "Modern Control Engineering", Prentice Hall, 2010.
5	B. C. Kuo, "Automatic Control system", Prentice Hall, 1995.
6	J. J. D'Azzo and C. H. Houpis, "Linear control system analysis and design (conventional and modern)", McGraw Hill, 1995.
7	R. T. Stefani and G. H. Hostetter, "Design of feedback Control Systems", Saunders College Pub, 1994

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7EE4-21: EMBEDDED SYSTEM LAB

Credit: 2 **Max. Marks: 100(IA:60, ETE:40)**
0L+0T+4P

SN	Contents
1	Introduction to Embedded Systems and their working.
2	Data transfer instructions using different addressing modes and block transfer.
3	Write a program for Arithmetic operations in binary and BCD-addition, subtraction, multiplication and division and display.
4	Interfacing D/A converter & Write a program for generation of simple waveforms such as triangular, ramp, Square etc.
5	Write a program to interfacing IR sensor to realize obstacle detector.
6	Write a program to implement temperature measurement and displaying the same on an LCD display.
7	Write a program for interfacing GAS sensor and perform GAS leakage detection.
8	Write a program to design the Traffic Light System and implement the same using suitable hardware.
9	Write a program for interfacing finger print sensor.
10	Write a program for Master Slave Communication between using suitable hardware and using SPI
11	Write a program for variable frequency square wave generation using with suitable hardware.
12	Write a program to implement a PWM based speed controller for 12 V/24V DC Motor incorporating a suitable potentiometer to provide the set point.

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7EE4-22: Advanced Control System Lab

Credit: 2 **Max. Marks: 100(IA:60, ETE:40)**
0L+0T+4P

SN	Contents
1	Determination of transfer functions of DC servomotor and AC servomotor.
2	Time domain response of rotary servo and Linear servo (first order and second order) systems using MATLAB/Simulink.
3	Simulate Speed and position control of DC Motor
4	Frequency response of small-motion, linearized model of industrial robot (first and second order) system using MATLAB.
5	Characteristics of PID controllers using MATLAB. Design and implementation of P, PI and PID Controllers for temperature and level control systems;
6	Design and implement closed loop control of DC Motor using MAT-LAB/Simulink and suitable hardware platform.
7	Implementation of digital controller using microcontroller;
8	Design and implementation of controller for practical systems - inverted pen-dulum system.
9	To design and implement control action for maintaining a pendulum in the upright position (even when subjected to external disturbances) through LQR technique in an Arduino Mega.
10	The fourth order, nonlinear and unstable real-time control system (Pendulum & Cart Control System)
11	Mini project on real life motion control system

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8EE4-11: HVDC TRANSMISSION SYSTEM

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	CONTENTS	Hours
1	**Introduction:** Objective, scope and outcome of the course.	01
2	**dc Transmission Technology:** Comparison of AC and dc Transmission (Economics, Technical Performance and Reliability). Application of DC Transmission. Types of HVdc Systems. Components of a HVdc system. Line Commutated Converter and Voltage Source Converter based systems.	04
3	**Analysis of Line Commutated and Voltage Source Converters:** Line Commutated Converters (LCCs): Six pulse converter, Analysis neglecting commutation overlap, harmonics, Twelve Pulse Converters. Inverter Operation. Effect of Commutation Overlap. Expressions for average dc voltage, AC current and reactive power absorbed by the converters. Effect of Commutation Failure, Misfire and Current Extinction in LCC links. Voltage Source Converters (VSCs): Two and Three-level VSCs. PWM schemes: Selective Harmonic Elimination, Sinusoidal Pulse Width Modulation. Analysis of a six pulse converter. Equations in the rotating frame. Real and Reactive power control using a VSC.	10
4	**Control of HVdc Converters:** Principles of Link Control in a LCCHVdc system. Control Hierarchy, Firing Angle Controls – Phase-Locked Loop, Current and Extinction Angle Control, Starting and Stopping of a Link. Higher level Controllers Power control, Frequency Control, Stability Controllers. Reactive Power Control. Principles of Link Control in a VSC HVdc system: Power flow and dc Voltage Control. Reactive Power Control/AC voltage regulation	10
5	**Components of HVdc systems:** Smoothing Reactors, Reactive Power Sources and Filters in LCC HVdc systems DC line: Corona Effects. Insulators, Transient Over-voltages. dc line faults in LCC systems. dc line faults in VSC systems. dc breakers. Monopolar Operation. Ground Electrodes	08
6	**Stability Enhancement using HVdc Control:** Basic Concepts: Power System Angular, Voltage and Frequency Stability. Power Modulation: basic principles – synchronous and asynchronous links. Voltage Stability Problem in AC/dc systems.	04
7	**MTdc Links:** Multi-Terminal and Multi-Infeed Systems. Series and Parallel MTdc systems using LCCs. MTdc systems using VSCs. Modern Trends in HVdcTechnology. Introduction to Modular Multi-level Converters	04
	TOTAL	

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Text/Reference Books	
1	K. R. Padiyar, "HVDC Power Transmission Systems", New Age International Publishers, 2011.
2	J. Arrillaga, "High Voltage Direct Current Transmission", Peter Peregrinus Ltd., 1983.
3	E. W. Kimbark, "Direct Current Transmission", Vol.1, Wiley-Interscience, 1971.

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8EE4-12: Line-Commutated and Active PWM Rectifiers

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	CONTENTS	Hours
1	**Introduction:** Objective, scope and outcome of the course.	01
2	**Diode rectifiers with passive filtering** Half-wave diode rectifier with RL and RC loads; 1-phase full-wave diode rectifier with L, C and LC filter; 3-phase diode rectifier with L, C and LC filter; continuous and discontinuous conduction, input current waveshape, effect of source inductance; commutation overlap.	06
3	**Thyristor rectifiers with passive filtering** Half-wave thyristor rectifier with RL and RC loads; 1-phase thyristor rectifier with L and LC filter; 3-phase thyristor rectifier with L and LC filter; continuous and discontinuous conduction, input current waveshape.	06
4	**Multi-Pulse converter** Review of transformer phase shifting, generation of 6-phase ac voltage from 3-phase ac, 6- pulse converter and 12-pulse converters with inductive loads, steady state analysis, commutation overlap, notches during commutation.	06
5	**Single-phase ac-dc single-switch boost converter** Review of dc-dc boost converter, power circuit of single-switch ac-dc converter, steady state analysis, unity power factor operation, closed-loop control structure.	06
6	**Ac-dc bidirectional boost converter** Review of 1-phase inverter and 3-phase inverter, power circuits of 1-phase and 3-phase ac-dc boost converter, steady state analysis, operation at leading, lagging and unity power factors. Rectification and regenerating modes. Phasor diagrams, closed-loop control structure.	06
7	Isolated single-phase ac-dc flyback converter Dc-dc flyback converter, output voltage as a function of duty ratio and transformer turns ratio. Power circuit of ac-dc flyback converter, steady state analysis, unity power factor operation, closed loop control structure.	10
	TOTAL	

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Text/Reference Books	
1	G. De, "Principles of Thyristorised Converters", Oxford & IBH Publishing Co, 1988.
2	J.G. Kassakian, M. F. Schlecht and G. C. Verghese, "Principles of Power Electronics", AddisonWesley, 1991.
3	L. Umanand, "Power Electronics: Essentials and Applications", Wiley India, 2009.
4	N. Mohan and T. M. Undeland, "Power Electronics: Converters, Applications and Design", John Wiley & Sons, 2007.
5	R. W. Erickson and D. Maksimovic, "Fundamentals of Power Electronics", Springer Science & Business Media, 2001.

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8EE4-13: ADVANCED ELECTRIC DRIVES

Credit: 2 **Max. Marks: 100(IA:20, ETE:80)**
2L+0T+0P **End Term Exam: 2 Hours**

SN	CONTENTS	Hours
1	**Introduction:** Objective, scope and outcome of the course.	01
2	**Power Converters for AC drives:** PWM control of inverter, selected harmonic elimination, space vector modulation, current control of VSI, three level inverter, Different topologies, SVM for 3 level inverter, Diode rectifier with boost chopper, PWM converter as line side rectifier, current fed inverters with self-commutated devices. Control of CSI, H bridge as a 4-Q drive.	06
3	**Induction motor drives:** Different transformations and reference frame theory, modeling of induction machines, voltage fed inverter control-v/f control, vector control, direct torque and flux control(DTC).	06
4	**Synchronous motor drives:** Modeling of synchronous machines, open loop v/f control, vector control, direct torque control, CSI fed synchronous motor drives.	04
5	**Permanent magnet motor drives:** Introduction to various PM motors, BLDC and PMSM drive configuration, comparison, block diagrams, Speed and torque control in BLDC and PMSM	04
6	**Switched reluctance motor drives:** Evolution of switched reluctance motors, various topologies for SRM drives, comparison. Closed loop speed and torque control of SRM.	03
7	**DSP based motion control:** Use of DSPs in motion control, various DSPs available, realization of some basic blocks in DSP for implementation of DSP based motion control	04
	TOTAL	

Text/Reference Books	
1	B. K. Bose, "Modern Power Electronics and AC Drives", Pearson Education, Asia, 2003.
2	P. C. Krause, O. Wasynczuk and S. D. Sudhoff, "Analysis of Electric Machinery and Drive Systems", John Wiley & Sons, 2013.
3	H. A. Taliyat and S. G. Campbell, "DSP based Electromechanical Motion Control", CRC press, 2003.
4	R. Krishnan, "Permanent Magnet Synchronous and Brushless DC motor Drives", CRC Press, 2009.

8EE4-21 Energy Systems Lab

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Credit: 2 **Max. Marks: 100(IA:60, ETE:40)**
0L+0T+3P **End Term Exam: 3 Hours**

SN	Contents
1	V-I characteristics of solar panels at various levels of insolation.
2	Experiment of solar Charge controller, PWM, MPPT with boost converter and algorithms.
3	Experiment on Shadowing effect and diode based solution in1kWpSolar PV System.
4	Study of wind turbine generators with DC generators, DFIG, PMSG etc.
5	Performance Study of Solar Flat Plate Thermal Collector Operation with Variation in Mass Flow Rate and Level of Radiation.
6	Characterization of Various PV Modules Using large area Sun Simulator.
7	Study of micro-hydel pumped storage system.
8	Experiment on Fuel Cell and its operation.
9	Study of 100 kW or higher solar PV plant.
10	Study different components of Micro Grid.
11	To design and simulate hybrid wind-solar power generation system using simulation software.
12	Experiment on Performance Assessment of Hybrid (Solar-Wind- Battery) Power System.
13	Simulation study on Intelligent Controllers for on-grid and off-grid Hybrid Power Systems.

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Scheme & Syllabus of

UNDERGRADUATE DEGREE COURSE

B.Tech. VII & VIII Semester

Computer Science and Engineering

Rajasthan Technical University, Kota

Effective from session: 2019 – 2020

Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
4th Year – VII Semester

SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
THEORY											
1	PCC	7CS4-01	Internet of Things	3	0	0	3	30	120	**150**	**3**
2	OE		Open Elective - I	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**	**6**	**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	7CS4-21	Internet of Things Lab	0	0	4	2	60	40	**100**	**2**
4	PCC	7CS4-22	Cyber Security Lab	0	0	4	2	60	40	**100**	**2**
6	PSIT	7CS7-30	Industrial Training	1	0	0				**125**	**2.5**
7	PSIT	7CS7-40	Seminar	2	0	0				**100**	**2**
8	SODECA	7CS8-00	Social Outreach, Discipline &Extra Curricular Activities							**25**	**0.5**
			Sub- Total	**0**	**0**	**10**	**4**	**120**	**80**	**450**	**9**
			TOTAL OF VII SEMESTER	**6**	**0**	**10**	**10**	**180**	**320**	**750**	**15**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*
ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

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Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
4th Year – VIII Semester

SN	Category	Course Code	Course Title	Contact hrs/week L	T	P	Marks Exm Hrs	IA	ETE	Total	Cr
THEORY											
1	PCC/ PEC	8CS4-01	Big Data Analytics	3	0	0	3	30	120	**150**	**3**
2	OE		Open Elective - II	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**	**6**	**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	8CS4-21	Big Data Analytics Lab	0	0	2	2	30	20	**50**	**1**
4	PCC	8CS4-22	Software Testing and Validation Lab	0	0	2	2	30	20	**50**	**1**
5	PSIT	8CS7-50	Project	3	0	0		210	140	**350**	**7**
6	SODECA	8CS8-00	Social Outreach, Discipline &Extra Curricular Activities							**25**	**0.5**
			Sub- Total	**0**	**0**	**4**	**4**	**120**	**80**	**475**	**9.5**
			TOTAL OF VIII SEMESTER	**6**	**0**	**4**	**10**	**180**	**320**	**775**	**15.5**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*

ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

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List of Open Electives for Computer Science & Engineering				
Subject Code	**Title**		**Subject Code**	**Title**
Open Elective - I			**Open Elective - II**	
7AG6-60.1	Human Engineering and Safety		8AG6-60.1	Energy Management
7AG6-60.2	Environmental Engineering and Disaster Management		8AG6-60.2	Waste and By-product Utilization
7AN6-60.1	Aircraft Avionic System		8AN6-60.1	Finite Element Methods
7AN6-60.2	Non-Destructive Testing		8AN6-60.2	Factor of Human Interactions
7CH6-60.1	Optimization Techniques		8CH6-60.1	Refinery Engineering Design
7CH6-60.2	Sustainable Engineering		8CH6-60.2	Fertilizer Technology
7CR6-60.1	Introduction to Ceramic Science & Technology		8CR6-60.1	Electrical and Electronic Ceramics
7CR6-60.2	Plant, Equipment and Furnace Design		8CR6-60.2	Biomaterials
7CE6-60.1	Environmental Impact Analysis		8CE6-60.1	Composite Materials
7CE6-60.2	Disaster Management		8CE6-60.2	Fire and Safety Engineering
7EE6-60.1	Electrical Machines and Drives		8EE6-60.1	Energy Audit and Demand side Management
7EE6-60.2	Power Generation Sources.		8EE6-60.2	Soft Computing
7EC6-60.1	Principle of Electronic communication		8EC6-60.1	Industrial and Biomedical applications of RF Energy
7EC6-60.2	Micro and Smart System Technology		8EC6-60.2	Robotics and control
7ME6-60.1	Finite Element Analysis		8ME6-60.1	Operations Research
7ME6-60.2	Quality Management		8ME6-60.2	Simulation Modeling and Analysis
7MI6-60.1	Rock Engineering		8MI6-60.1	Experimental Stress Analysis
7MI6-60.2	Mineral Processing		8MI6-60.2	Maintenance Management
7PE6-60.1	Pipeline Engineering		8PE6-60.1	Unconventional Hydrocarbon Resources
7PE6-60.2	Water Pollution control Engineering		8PE6-60.2	Energy Management & Policy
7TT6-60.1	Technical Textiles		8TT6-60.1	Material and Human Resource Management
7TT6-60.2	Garment Manufacturing Technology		8TT6-60.2	Disaster Management

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7CS4-01: Internet of Things

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	**Introduction:** Objective, scope and outcome of the course.	01
2	**Introduction to IoT:** Definition and characteristics of IoT, Design of IOT: Physical design of IOT, Logical Design of IOT- Functional Blocks, communication models, communication APIs, IOT enabling Technologies- Wireless Sensor Networks, Cloud computing, big data analytics, embedded systems. IOT Levels and deployment templates.	08
3	**IoT Hardware and Software:** Sensor and actuator, Humidity sensors, Ultrasonic sensor, Temperature Sensor, Arduino, Raspberry Pi, LiteOS, RIoTOS, Contiki OS, Tiny OS.	07
4	**Architecture and Reference Model:** Introduction, Reference Model and architecture, Representational State Transfer (REST) architectural style, Uniform Resource Identifiers (URIs). Challenges in IoT- Design challenges, Development challenges, Security challenges, Other challenges.	08
5	**IOT and M2M:** M2M, Difference and similarities between IOT and M2M, Software defined networks, network function virtualization, difference between SDN and NFV for IoT.	08
6	**Case study of IoT Applications:** Domain specific IOTs- Home automation, Cities, environment, Energy, Retail, Logistics, Agriculture, Industry, Health and Lifestyles.	08
	Total	40

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7CS4-21: Internet of Things Lab

Credit: 2 **Max. Marks: 100(IA:60, ETE:40)**
0L+0T+4P **End Term Exam: 2 Hours**

SN	List of Experiments
1	Start Raspberry Pi and try various Linix commands in command terminal window: *ls, cd, touch, mv, rm, man, mkdir, rmdir, tar, gzip, cat, more, less, ps, sudo, cron, chown,* *chgrp, ping etc.*
2	Run some python programs on Pi like: a) Read your name and print Hello message with name b) Read two numbers and print their sum, difference, product and division. c) Word and character count of a given string. d) Area of a given shape (rectangle, triangle and circle) reading shape and appropriate values from standard input.
3	Run some python programs on Pi like: a) Print a name 'n' times, where name and n are read from standard input, using for and while loops. b) Handle Divided by Zero Exception. c) Print current time for 10 times with an interval of 10 seconds. d) Read a file line by line and print the word count of each line.
4	a) Light an LED through Python program b) Get input from two switches and switch on corresponding LEDs c) Flash an LED at a given on time and off time cycle, where the two times are taken from a file.
5	a) Flash an LED based on cron output (acts as an alarm) b) Switch on a relay at a given time using cron, where the relay's contact terminals are connected to a load. c) Get the status of a bulb at a remote place (on the LAN) through web.
	The student should have hands on experience in using various sensors like temperature, humidity, smoke, light, etc. and should be able to use control web camera, network, and relays connected to the Pi.

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7CS4-22: Cyber Security Lab

Credit: 2 **Max. Marks: 100(IA:60, ETE:40)**
0L+0T+4P **End Term Exam: 2 Hours**

SN	List of Experiments
1	Implement the following Substitution & Transposition Techniques concepts: a) Caesar Cipherb) Rail fence row & Column Transformation
2	Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript. Consider the end user as one of the parties (Alice) and the JavaScript application as other party (bob).
3	Implement the following Attack: a) Dictionary Attack b) Brute Force Attack
4	Installation of Wire shark, tcpdump, etc and observe data transferred in client server communication using UDP/TCP and identify the UDP/TCP datagram.
5	Installation of rootkits and study about the variety of options.
6	Perform an Experiment to Sniff Traffic using ARP Poisoning.
7	Demonstrate intrusion detection system using any tool (snort or any other s/w).
8	Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures.
	PROJECT: In a small area location such as a house, office or in a classroom, there is a small network called a Local Area Network (LAN). The project aims to transfer a file peer-to-peer from one computer to another computer in the same LAN. It provides the necessary authentication for file transferring in the network transmission. By implementing the Server-Client technology, use a File Transfer Protocol mechanism and through socket programming, the end user is able to send and receive the encrypted and decrypted file in the LAN. An additional aim of the project is to transfer a file between computers securely in LANs. Elements of security are needed in the project because securing the files is an important task, which ensures files are not captured or altered by anyone on the same network. Whenever you transmit files over a network, there is a good chance your data will be encrypted by encryption technique. Any algorithm like AES is used to encrypt the file that needs to transfer to another computer. The encrypted file is then sent to a receiver computer and will need to be decrypted before the user can open the file.

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8CS4-01: Big Data Analytics

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	**Introduction:**Objective, scope and outcome of the course.	01
2	**Introduction to Big Data:** Big data features and challenges, Problems with Traditional Large-Scale System , Sources of Big Data, 3 V's of Big Data, Types of Data. Working with Big Data: Google File System. Hadoop Distributed File System (HDFS) - Building blocks of Hadoop (Namenode. Data node. Secondary Namenode. Job Tracker. Task Tracker), Introducing and Configuring Hadoop cluster (Local. Pseudo-distributed mode, Fully Distributed mode). Configuring XML files.	10
3	**Writing MapReduce Programs:** A Weather Dataset. Understanding Hadoop API for MapReduce Framework (Old and New). Basic programs of Hadoop MapReduce: Driver code. Mapper code, Reducer code. Record Reader, Combiner, Partitioner.	08
4	**Hadoop I/O:** The Writable Interface. Writable Comparable and comparators. Writable Classes: Writable wrappers for Java primitives. Text. Bytes Writable. Null Writable, Object Writable and Generic Writable. Writable collections. Implementing a Custom Writable: Implementing a Raw Comparator for speed, Custom comparators.	08
5	**Pig:**Hadoop Programming Made Easier Admiring the Pig Architecture, Going with the Pig Latin Application Flow. Working through the ABCs of Pig Latin. Evaluating Local and Distributed Modes of Running Pig Scripts, Checking out the Pig Script Interfaces, Scripting with Pig Latin.	07
6	**Applying Structure to Hadoop Data with Hive:** Saying Hello to Hive, Seeing How the Hive is Put Together, Getting Started with Apache Hive. Examining the Hive Clients. Working with Hive Data Types. Creating and Managing Databases and Tables, Seeing How the Hive Data Manipulation Language Works, Querying and Analyzing Data.	06
	Total	40

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

8CS4-21: Big Data Analytics Lab

Credit: 2 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P **End Term Exam: 2 Hours**

SN	List of Experiments
1	Implement the following Data structures in Java i) Linked Lists ii) Stacks iii) Queues iv) Set v) Map
2	Perform setting up and Installing Hadoop in its three operating modes: Standalone, Pseudodistributed, Fully distributed.
3	Implement the following file management tasks in Hadoop: • Adding files and directories • Retrieving files • Deleting files Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.
4	Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.
5	Write a Map Reduce program that mines weather data. Weather sensors collecting data everyhour at many locations across the globe gather a large volume of log data, which is a goodcandidate for analysis with MapReduce, since it is semi structured and record-oriented.
6	Implement Matrix Multiplication with Hadoop Map Reduce
7	Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.
8	Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes.
9	Solve some real life big data problems.

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

8CS4-22: Software Testing and Validation Lab

Credit: 1 **Max. Marks:50 (IA:30, ETE:20)**
0L+0T+2P **End Term Exam: 2 Hours**

<table>
<tr><th>SN</th><th>List of Experiments</th></tr>
<tr><td>1</td><td>a) Write a program that calculates the area and perimeter of the circle. And find the Coverage & Test Cases of that program using JaButi Tool.

b) Write a program which read the first name and last name from console and matching with expected result by using JaBuTi.

c) Write a program that takes three double numbers from the java console representing , respectively, the three coefficients a,b, and c of a quadratic equation.

d) Write a program that reads commercial website URL from a url from file .you should expect that the URL starts with www and ends with .com. retrieve the name of the site and output it. For instance, if the user inputs www.yahoo.com, you should output yahoo. After that find the test cases and coverage using JaButi.

e) Write a program for a calculator and find the test case and coverage and Def-use-graph.

f) Write a program that reads two words representing passwords from the java console and outputs the number of character in the smaller of the two. For example, if the words are open and sesame, then the output should be 4, the length of the shorter word, open. And test this program using JaButi</td></tr>
<tr><td>2</td><td>Analyse the performance of following website using JMeter.
<table>
<tr><td>Site
Amazon</td><td>Website
Amazon.com</td><td>Type
shopping</td></tr>
<tr><td>Flip kart</td><td>Flipkart.com</td><td>shopping</td></tr>
<tr><td>Railway reservation</td><td>Irctc.co.in</td><td>Ticket booking site</td></tr>
<tr><td>Train searching</td><td>Erail.in</td><td>Train searching</td></tr>
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<tr><td>3</td><td>Calculate the mutation score of programs given in 1(a) to 1 (f) using jumble Tool.</td></tr>
<tr><td>4</td><td>Calculate the coverage analysis of programs given in 1 (a) to 1 (f) using Eclemma Free open source Tool.</td></tr>
</table>

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Rajasthan Technical University, Kota

5 Generate Test sequences and validate using Selenium tool for given websites below:

Site	Website	Type
Amazon	Amazon.com	shopping
Flip kart	Flipkart.com	shopping
Railway reservation	Irctc.co.in	Ticket booking site
Train searching	Erail.in	Train searching

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Scheme & Syllabus of

UNDERGRADUATE DEGREE COURSE

B.Tech. VII & VIII Semester

Computer Science and Engineering

Rajasthan Technical University, Kota

Effective from session: 2019 – 2020

Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
4th Year – VII Semester

SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
THEORY											
1	PCC	7CS4-01	Internet of Things	3	0	0	3	30	120	**150**	**3**
2	OE		Open Elective - I	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**	**6**	**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	7CS4-21	Internet of Things Lab	0	0	4	2	60	40	**100**	**2**
4	PCC	7CS4-22	Cyber Security Lab	0	0	4	2	60	40	**100**	**2**
6	PSIT	7CS7-30	Industrial Training	1	0	0				**125**	**2.5**
7	PSIT	7CS7-40	Seminar	2	0	0				**100**	**2**
8	SODECA	7CS8-00	Social Outreach, Discipline &Extra Curricular Activities							**25**	**0.5**
			Sub- Total	**0**	**0**	**10**	**4**	**120**	**80**	**450**	**9**
			TOTAL OF VII SEMESTER	**6**	**0**	**10**	**10**	**180**	**320**	**750**	**15**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*
ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
4th Year – VIII Semester

SN	Category	Course Code	Course Title	Contact hrs/week L	T	P	Marks Exm Hrs	IA	ETE	Total	Cr
THEORY											
1	PCC/ PEC	8CS4-01	Big Data Analytics	3	0	0	3	30	120	**150**	**3**
2	OE		Open Elective - II	3	0	0	3	30	120	**150**	**3**
			Sub Total	**6**	**0**	**0**	**6**	**60**	**240**	**300**	**6**
PRACTICAL & SESSIONAL											
3	PCC	8CS4-21	Big Data Analytics Lab	0	0	2	2	30	20	**50**	**1**
4	PCC	8CS4-22	Software Testing and Validation Lab	0	0	2	2	30	20	**50**	**1**
5	PSIT	8CS7-50	Project	3	0	0		210	140	**350**	**7**
6	SODECA	8CS8-00	Social Outreach, Discipline &Extra Curricular Activities							**25**	**0.5**
			Sub- Total	**0**	**0**	**4**	**4**	**120**	**80**	**475**	**9.5**
			TOTAL OF VIII SEMESTER	**6**	**0**	**4**	**10**	**180**	**320**	**775**	**15.5**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*

ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

List of Open Electives for Computer Science & Engineering				
Subject Code	**Title**		**Subject Code**	**Title**
Open Elective - I			**Open Elective - II**	
7AG6-60.1	Human Engineering and Safety		8AG6-60.1	Energy Management
7AG6-60.2	Environmental Engineering and Disaster Management		8AG6-60.2	Waste and By-product Utilization
7AN6-60.1	Aircraft Avionic System		8AN6-60.1	Finite Element Methods
7AN6-60.2	Non-Destructive Testing		8AN6-60.2	Factor of Human Interactions
7CH6-60.1	Optimization Techniques		8CH6-60.1	Refinery Engineering Design
7CH6-60.2	Sustainable Engineering		8CH6-60.2	Fertilizer Technology
7CR6-60.1	Introduction to Ceramic Science & Technology		8CR6-60.1	Electrical and Electronic Ceramics
7CR6-60.2	Plant, Equipment and Furnace Design		8CR6-60.2	Biomaterials
7CE6-60.1	Environmental Impact Analysis		8CE6-60.1	Composite Materials
7CE6-60.2	Disaster Management		8CE6-60.2	Fire and Safety Engineering
7EE6-60.1	Electrical Machines and Drives		8EE6-60.1	Energy Audit and Demand side Management
7EE6-60.2	Power Generation Sources.		8EE6-60.2	Soft Computing
7EC6-60.1	Principle of Electronic communication		8EC6-60.1	Industrial and Biomedical applications of RF Energy
7EC6-60.2	Micro and Smart System Technology		8EC6-60.2	Robotics and control
7ME6-60.1	Finite Element Analysis		8ME6-60.1	Operations Research
7ME6-60.2	Quality Management		8ME6-60.2	Simulation Modeling and Analysis
7MI6-60.1	Rock Engineering		8MI6-60.1	Experimental Stress Analysis
7MI6-60.2	Mineral Processing		8MI6-60.2	Maintenance Management
7PE6-60.1	Pipeline Engineering		8PE6-60.1	Unconventional Hydrocarbon Resources
7PE6-60.2	Water Pollution control Engineering		8PE6-60.2	Energy Management & Policy
7TT6-60.1	Technical Textiles		8TT6-60.1	Material and Human Resource Management
7TT6-60.2	Garment Manufacturing Technology		8TT6-60.2	Disaster Management

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

7CS4-01: Internet of Things

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	**Introduction:** Objective, scope and outcome of the course.	01
2	**Introduction to IoT:** Definition and characteristics of IoT, Design of IOT: Physical design of IOT, Logical Design of IOT- Functional Blocks, communication models, communication APIs, IOT enabling Technologies- Wireless Sensor Networks, Cloud computing, big data analytics, embedded systems. IOT Levels and deployment templates.	08
3	**IoT Hardware and Software:** Sensor and actuator, Humidity sensors, Ultrasonic sensor, Temperature Sensor, Arduino, Raspberry Pi, LiteOS, RIoTOS, Contiki OS, Tiny OS.	07
4	**Architecture and Reference Model:** Introduction, Reference Model and architecture, Representational State Transfer (REST) architectural style, Uniform Resource Identifiers (URIs). Challenges in IoT- Design challenges, Development challenges, Security challenges, Other challenges.	08
5	**IOT and M2M:** M2M, Difference and similarities between IOT and M2M, Software defined networks, network function virtualization, difference between SDN and NFV for IoT.	08
6	**Case study of IoT Applications:** Domain specific IOTs- Home automation, Cities, environment, Energy, Retail, Logistics, Agriculture, Industry, Health and Lifestyles.	08
	Total	40

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

7CS4-21: Internet of Things Lab

Credit: 2 **Max. Marks: 100(IA:60, ETE:40)**
0L+0T+4P **End Term Exam: 2 Hours**

SN	List of Experiments
1	Start Raspberry Pi and try various Linix commands in command terminal window: *ls, cd, touch, mv, rm, man, mkdir, rmdir, tar, gzip, cat, more, less, ps, sudo, cron, chown,* *chgrp, ping etc.*
2	Run some python programs on Pi like: a) Read your name and print Hello message with name b) Read two numbers and print their sum, difference, product and division. c) Word and character count of a given string. d) Area of a given shape (rectangle, triangle and circle) reading shape and appropriate values from standard input.
3	Run some python programs on Pi like: a) Print a name 'n' times, where name and n are read from standard input, using for and while loops. b) Handle Divided by Zero Exception. c) Print current time for 10 times with an interval of 10 seconds. d) Read a file line by line and print the word count of each line.
4	a) Light an LED through Python program b) Get input from two switches and switch on corresponding LEDs c) Flash an LED at a given on time and off time cycle, where the two times are taken from a file.
5	a) Flash an LED based on cron output (acts as an alarm) b) Switch on a relay at a given time using cron, where the relay's contact terminals are connected to a load. c) Get the status of a bulb at a remote place (on the LAN) through web.
	The student should have hands on experience in using various sensors like temperature, humidity, smoke, light, etc. and should be able to use control web camera, network, and relays connected to the Pi.

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

7CS4-22: Cyber Security Lab

Credit: 2 **Max. Marks: 100(IA:60, ETE:40)**
0L+0T+4P **End Term Exam: 2 Hours**

SN	List of Experiments
1	Implement the following Substitution & Transposition Techniques concepts: a) Caesar Cipherb) Rail fence row & Column Transformation
2	Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript. Consider the end user as one of the parties (Alice) and the JavaScript application as other party (bob).
3	Implement the following Attack: a) Dictionary Attack b) Brute Force Attack
4	Installation of Wire shark, tcpdump, etc and observe data transferred in client server communication using UDP/TCP and identify the UDP/TCP datagram.
5	Installation of rootkits and study about the variety of options.
6	Perform an Experiment to Sniff Traffic using ARP Poisoning.
7	Demonstrate intrusion detection system using any tool (snort or any other s/w).
8	Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures.
	PROJECT: In a small area location such as a house, office or in a classroom, there is a small network called a Local Area Network (LAN). The project aims to transfer a file peer-to-peer from one computer to another computer in the same LAN. It provides the necessary authentication for file transferring in the network transmission. By implementing the Server-Client technology, use a File Transfer Protocol mechanism and through socket programming, the end user is able to send and receive the encrypted and decrypted file in the LAN. An additional aim of the project is to transfer a file between computers securely in LANs. Elements of security are needed in the project because securing the files is an important task, which ensures files are not captured or altered by anyone on the same network. Whenever you transmit files over a network, there is a good chance your data will be encrypted by encryption technique. Any algorithm like AES is used to encrypt the file that needs to transfer to another computer. The encrypted file is then sent to a receiver computer and will need to be decrypted before the user can open the file.

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

8CS4-01: Big Data Analytics

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	**Introduction:**Objective, scope and outcome of the course.	01
2	**Introduction to Big Data:** Big data features and challenges, Problems with Traditional Large-Scale System , Sources of Big Data, 3 V's of Big Data, Types of Data. Working with Big Data: Google File System. Hadoop Distributed File System (HDFS) - Building blocks of Hadoop (Namenode. Data node. Secondary Namenode. Job Tracker. Task Tracker), Introducing and Configuring Hadoop cluster (Local. Pseudo-distributed mode, Fully Distributed mode). Configuring XML files.	10
3	**Writing MapReduce Programs:** A Weather Dataset. Understanding Hadoop API for MapReduce Framework (Old and New). Basic programs of Hadoop MapReduce: Driver code. Mapper code, Reducer code. Record Reader, Combiner, Partitioner.	08
4	**Hadoop I/O:** The Writable Interface. Writable Comparable and comparators. Writable Classes: Writable wrappers for Java primitives. Text. Bytes Writable. Null Writable, Object Writable and Generic Writable. Writable collections. Implementing a Custom Writable: Implementing a Raw Comparator for speed, Custom comparators.	08
5	**Pig:**Hadoop Programming Made Easier Admiring the Pig Architecture, Going with the Pig Latin Application Flow. Working through the ABCs of Pig Latin. Evaluating Local and Distributed Modes of Running Pig Scripts, Checking out the Pig Script Interfaces, Scripting with Pig Latin.	07
6	**Applying Structure to Hadoop Data with Hive:** Saying Hello to Hive, Seeing How the Hive is Put Together, Getting Started with Apache Hive. Examining the Hive Clients. Working with Hive Data Types. Creating and Managing Databases and Tables, Seeing How the Hive Data Manipulation Language Works, Querying and Analyzing Data.	06
	Total	40

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

8CS4-21: Big Data Analytics Lab

Credit: 2 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P **End Term Exam: 2 Hours**

SN	List of Experiments
1	Implement the following Data structures in Java i) Linked Lists ii) Stacks iii) Queues iv) Set v) Map
2	Perform setting up and Installing Hadoop in its three operating modes: Standalone, Pseudodistributed, Fully distributed.
3	Implement the following file management tasks in Hadoop: • Adding files and directories • Retrieving files • Deleting files Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.
4	Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.
5	Write a Map Reduce program that mines weather data. Weather sensors collecting data everyhour at many locations across the globe gather a large volume of log data, which is a goodcandidate for analysis with MapReduce, since it is semi structured and record-oriented.
6	Implement Matrix Multiplication with Hadoop Map Reduce
7	Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.
8	Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes.
9	Solve some real life big data problems.

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

8CS4-22: Software Testing and Validation Lab

Credit: 1 **Max. Marks:50 (IA:30, ETE:20)**
0L+0T+2P **End Term Exam: 2 Hours**

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<tr><td>1</td><td>a) Write a program that calculates the area and perimeter of the circle. And find the Coverage & Test Cases of that program using JaButi Tool.

b) Write a program which read the first name and last name from console and matching with expected result by using JaBuTi.

c) Write a program that takes three double numbers from the java console representing , respectively, the three coefficients a,b, and c of a quadratic equation.

d) Write a program that reads commercial website URL from a url from file .you should expect that the URL starts with www and ends with .com. retrieve the name of the site and output it. For instance, if the user inputs www.yahoo.com, you should output yahoo. After that find the test cases and coverage using JaButi.

e) Write a program for a calculator and find the test case and coverage and Def-use-graph.

f) Write a program that reads two words representing passwords from the java console and outputs the number of character in the smaller of the two. For example, if the words are open and sesame, then the output should be 4, the length of the shorter word, open. And test this program using JaButi</td></tr>
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Rajasthan Technical University, Kota

5 Generate Test sequences and validate using Selenium tool for given websites below:

Site	Website	Type
Amazon	Amazon.com	shopping
Flip kart	Flipkart.com	shopping
Railway reservation	Irctc.co.in	Ticket booking site
Train searching	Erail.in	Train searching

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Scheme of

UNDERGRADUATE DEGREE COURSE

B.Tech. V & VI Semester

Computer Science and Engineering

Rajasthan Technical University, Kota

Effective from session: 2019 – 2020

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
3rd Year – V Semester

SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
THEORY											
1	ESC	5CS3-01	Information Theory & Coding	2	0	0	2	20	80	**100**	**2**
2	PCC/ PEC	5CS4-02	Compiler Design	3	0	0	3	30	120	**150**	**3**
3		5CS4-03	Operating System	3	0	0	3	30	120	**150**	**3**
4		5CS4-04	Computer Graphics & Multimedia	3	0	0	3	30	120	**150**	**3**
6		5CS4-05	Analysis of Algorithms	3	0	0	3	30	120	**150**	**3**
7		Professional Elective 1: (any one)		2	0	0	2	20	80	**100**	**2**
		5CS5-11	Wireless Communication								
		5CS5-12	Human-Computer Interaction								
		5CS5-13	Bioinformatics								
			Sub Total	**16**	**0**	**0**		**160**	**640**	**800**	**16**
PRACTICAL & SESSIONAL											
8	PCC	5CS4-21	Computer Graphics & Multimedia Lab	0	0	2	2	30	20	**50**	**1**
9		5CS4-22	Compiler Design Lab	0	0	2	2	30	20	**50**	**1**
10		5CS4-23	Analysis of Algorithms Lab	0	0	2	2	30	20	**50**	**1**
11		5CS4-24	Advance Java Lab	0	0	2	2	30	20	**50**	**1**
12	PSIT	5CS7-30	Industrial Training	0	0	1		75	50	**125**	**2.5**
13	SODECA	5CS8-00	Social Outreach, Discipline &Extra Curricular Activities						25	**25**	**0.5**
			Sub- Total	**0**	**0**	**9**		**195**	**155**	**350**	**7**
			TOTAL OF V SEMESTER	**16**	**0**	**9**		**355**	**795**	**1150**	**23**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*
ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
3rd Year – VI Semester

SN	Category	Course Code	Course Title	Contact hrs/week L	T	P	Marks Exm Hrs	IA	ETE	Total	Cr
THEORY											
1	ESC	6CS3-01	Digital Image Processing	2	0	0	2	20	80	**100**	**2**
2	PCC/ PEC	6CS4-02	Machine Learning	3	0	0	3	30	120	**150**	**3**
3		6CS4-03	Information Security System	2	0	0	2	20	80	**100**	**2**
4		6CS4-04	Computer Architecture and Organization	3	0	0	3	30	120	**150**	**3**
5		6CS4-05	Artificial Intelligence	2	0	0	2	20	80	**100**	**2**
6		6CS4-06	Cloud Computing	3	0	0	3	30	120	**150**	**3**
7		Professional Elective 1 (any one)		2	0	0	2	20	80	**100**	**2**
		6CS5-11	Distributed System								
		6CS5-12	Software Defined Network								
		6CS5-13	Ecommerce and ERP								
			Sub-Total	**17**	**0**	**0**		**170**	**680**	**850**	**17**
PRACTICAL & SESSIONAL											
8	PCC	6CS4-21	Digital Image Processing Lab	0	0	3	2	45	30	**75**	**1.5**
9		6CS4-22	Machine Learning Lab	0	0	3	2	45	30	**75**	**1.5**
10		6CS4-23	Python Lab	0	0	3	2	45	30	**75**	**1.5**
11		6CS4-24	Mobile Application Development Lab	0	0	3	2	45	30	**75**	**1.5**
12	SODECA	6CS8-00	Social Outreach, Discipline &Extra Curricular Activities						25	**25**	**0.5**
			Sub- Total	**0**	**0**	**12**		**180**	**145**	**325**	**6.5**
			TOTAL OF VI SEMESTER	**17**	**0**	**12**		**350**	**825**	**1175**	**23.5**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*

ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Scheme of

UNDERGRADUATE DEGREE COURSE

Computer Science and Engineering

Rajasthan Technical University, Kota

Effective from session: 2021 – 2022

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
2nd Year - III Semester

SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
THEORY											
1	BSC	3CS2-01	Advanced Engineering Mathematics	3	0	0	3	30	70	**100**	**3**
2	HSMC	3CS1-02/ 3CS1-03	Technical Communication/ Managerial Economics and Financial Accounting	2	0	0	2	30	70	**100**	**2**
3	ESC	3CS3-04	Digital Electronics	3	0	0	3	30	70	**100**	**3**
4	PCC	3CS4-05	Data Structures and Algorithms	3	0	0	3	30	70	**100**	**3**
5		3CS4-06	Object Oriented Programming	3	0	0	3	30	70	**100**	**3**
6		3CS4-07	Software Engineering	3	0	0	3	30	70	**100**	**3**
			Sub Total	**17**	**0**	**0**					**17**
PRACTICAL & SESSIONAL											
7	PCC	3CS4-21	Data Structures and Algorithms Lab	0	0	3		60	40	**100**	**1.5**
8		3CS4-22	Object Oriented Programming Lab	0	0	3		60	40	**100**	**1.5**
9		3CS4-23	Software Engineering Lab	0	0	3		60	40	**100**	**1.5**
10		3CS4-24	Digital Electronics Lab	0	0	3		60	40	**100**	**1.5**
11	PSIT	3CS7-30	Industrial Training	0	0	1		60	40	**100**	**1**
12	SODECA	3CS8-00	Social Outreach, Discipline & Extra Curricular Activities							**100**	**0.5**
			Sub- Total	**0**	**0**	**13**					**7.5**
			TOTAL OF III SEMESTER	**17**	**0**	**13**					**24.5**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*

ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

MCA (Master of Computer Applications)

MCA SYALLABUS YEAR-II SESSION 2021-22
YEAR-II

1. III-Semester (Second Year)

S No	Category	Credit
1	Theory	18
2	Practical	03
3	SODECA	02
	Total	**23**

III-Semester (Second Year) MCA Year 2 - Semester III								
Theory								
S. No.	**Course Code**	**Course Title**	**Hours**		**Marks**			**Credits**
			L	**P**	**IA**	**ETE**	**Total**	
1	MCA-301	Cloud Computing	3		30	70	100	3
2	MCA-302	Analysis and Design of Algorithm	3		30	70	100	3
3	MCA-303	Artificial Intelligence	3		30	70	100	3
4	MCA-304	Information Security	3		30	70	100	3
5	MCA-305	Mobile Application Development	3		30	70	100	3
6	MCA-306	Elective 1	3		30	70	100	3
Practical								
1	MCA-351	ADA Lab		2	30	70	100	01
2	MCA-352	Mobile Application Development Lab		2	30	70	100	01
3	MCA-353	Summer Industrial Training Presentation		2	30	70	100	01
4		SODECA						02
Total					**270**	**630**	**900**	**23**

L= Lecture, **P** = Practical, **IA** = Internal Assessment, **ETE** = End Term Exam

Elective -1:

a) Data Mining and Warehousing
b) Big Data Technologies
c) Soft Computing

2. IV-Semester (Second Year)

S No	Category	Credit
1	Theory	06
2	Practical	06
3	SODECA	02
	Total	**14**

MCA Year 2 - Semester IV								
Theory								
S. No.	**CourseCode**	**Course Title**	**Hours**		**Marks**			**Credits**
			L	**P**	**IA**	**ETE**	**Total**	
1	MCA-401	Software Project Management	3		30	70	100	3
2	MCA-402	Elective 2	3		30	70	100	3
Practical								
3	MCA-451	Industrial Project		12	30	70	100	06
4		SODECA						02
Total					**90**	**210**	**300**	**14**

L= Lecture, **P** = Practical, **IA** = Internal Assessment, **ETE** = End Term Exam

Note: The industrial project is part of the curriculum will be held in the institute as one of the laboratories. This may be in continuations to the project under taken by the student during industrial training and/or of industrial nature and/or have good industrial significance and/or may be done in collaboration with industry (as per suitability at the institute level).
The evaluation will be done in the institute by one internal examiner and one external examiner (from outside the institute) appointed by RTU.

Elective 2:

a) Principles of Management and Information System
b) Machine Learning
c) Data Science with R

Cloud Computing

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA 301**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Cloud: Cloud Computing at a Glance, Vision of Cloud Computing, Defining a Cloud, Cloud Computing Reference Model. Characteristics and Benefits, Challenges Ahead, Historical Developments, Risks and Approaches of Migration into Cloud ,Types of Clouds, Services models, Cloud Reference Model.	
Unit-2	**08 Hours**
Cloud Architecture: cloud architecture, features and benefits of Servive Models: Software as a Service (SaaS),Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Service providers, challenges and risks in cloud adoption. Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing.	
Unit-3	**08 Hours**
Virtualization: Introduction, Characteristics of Virtualized Environment, Taxonomy of Virtualization Techniques, Virtualization and Cloud computing, Pros and Cons of Virtualization, Technology Examples- VMware and Microsoft Hyper-V. Virtualization of CPU, Memory, I/O Devices, Virtual Cluster ,datacenterand Resources Management.	
Unit-4	**08 Hours**
Securing the Cloud: Cloud Information security fundamentals, Cloud security services, Design principles, Policy Implementation, Cloud Computing Security Challenges, Cloud Computing Security Architecture. Legal issues in cloud Computing. **Data Security in Cloud**: Risk Mitigation , Understanding and Identification of Threats in Cloud, SLA-Service Level Agreements, Trust Management	
Unit-5	**08 Hours**
Defining the Clouds for Enterprise: Storage as a service, Database as a service, Process as a service, Information as a service, Integration as a service and Testing as a service. **Disaster Management in Cloud:** Disasters in the Cloud, Disaster Recovery Planning.	

Text Books:

- San Murugesan, Irena Bojanova, "Encyclopedia of Cloud Computing", Wiley , 2016
- Kai Hawang , GeofreyC.Fox, Jack J. Dongarra, "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things", Morgan Kaufmann, 2013
- RajkumarBuyya, JemesBroberg, A. Goscinski, "Cloud Computing : Principal and Paradigms", Wiley, 2011

References:

- Krutz , Vines, "Cloud Security " , Wiley Pub, 2014
- Velte, "Cloud Computing- A Practical Approach" ,TMH Pub, 2015

Analysis and Design of Algorithm

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA-302**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction - Algorithm definition and specification – Design of Algorithms, and Analysis of Algorithms, Asymptotic Notations, Growth of function: Asymptotic notations Performance Analysis Space complexity, Time complexity, Divide and conquer- General method, applications – Binary search, Merge sort, Quick sort	
Unit-2	**08 Hours**
The Greedy method General method – knapsack problem – minimum cost spanning tree (Prims and Kruskal algorithm) – single source shortest path-DijkastraAlgorithm .	
Unit-3	**08 Hours**
Dynamic Programming – general method – multistage graphs – all pair shortest path – 0/1 Knapsack – traveling salesman problem – flow shop scheduling.	
Unit-4	**08 Hours**
Backtracking: General method – 8-Queens problem – sum of subsets – graph coloring – Hamiltonian cycles– knapsack problem. Branch and bound:- The Method – 0/1 Knapsack problem – traveling sales person.	
Unit-5	**08 Hours**
Parallel models Basic concepts, performance Measures, Parallel Algorithms: Parallel complexity, Analysis ofParallel Addition, Parallel Multiplication and division, parallel Evaluation of GeneralArithmetic Expressions, First-Order Linear recurrence. **NP-hard and NP-complete problems:** Basic Concepts, non-deterministic algorithms, Np-hard graph problems and scheduling problems.	

Text Books:

- AnanyLevitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.
- Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.

References:

- Donald E. Knuth, "The Art of Computer Programming", Volumes 1& 3 Pearson Education,2009.
- Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.

Artificial Intelligence

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-III

Subject Code	**MCA-303**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
General Issues and overview of AI Concept of AI, AI technique, Characteristics of AI applications Problem Solving, Search and Control Strategies General Problem solving, Production systems, and Control strategies, forward and backward chaining Exhaustive searches: Depth first and Breadth first search.	
Unit-2	**08 Hours**
Heuristic Search Techniques Hill climbing, Branch and Bound technique, Best first search and A* algorithm, AND/OR Graphs,Problem reduction and AO* algorithm, Constraint Satisfaction problems, Game Playing Min Max Search procedure.	
Unit-3	**08 Hours**
Knowledge Representation First Order Predicate Calculus, Resolution Principle and Unification, Inference Mechanisms Horn'sClauses, Semantic Networks, Frame Systems , Scripts, ConceptualDependency AI Programming Languages.	
Unit-4	**08 Hours**
Natural Language Processing: Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM – RegularExpressions, Finite-State Automata – English Morphology, Tokenization, Part-of-Speech Tagging, Issues in Part-of-Speech tagging.Semantics and pragmatics-Requirements for representation, Syntax-Driven Semantic analysis, Introduction to syntactic analysis.	
Unit-5	**08 Hours**
Expert Systems Introduction to Expert Systems, Architecture of Expert Systems, Expert System Shells, Knowledge Acquisition, Case Studies of Expert System. **Learning**: Concept of learning, Types of learning.	

Text Books:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill, 3 rd edition, 2009.
2. Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall of India, 1 st edition, 1997.
3. Winston, Patrick, Henry, "Artificial Intelligence", Pearson Education, 3 rd edition, 2004
4. SubhasreeBhattacharjee, "Artificial Intelligence for Student" Shroff Publishers and Distributors Pvt.LTD., 1 st Edition, 2016

ReferenceBooks:

1. Nils J. Nilsson, "Principles of Artificial Intelligence (Symbolic Computation / Artificial Intelligence)", reprint edition, 2014.
2. Stuart Russell, Peter Norvig, "Artificial Intelligence: A Modern Approach", Pearson Education, 3 rd edition, 2010.
3. Daniel Jurafsky, James H. Martin Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.

Information Security

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA 304**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Information Security : Attacks, Vulnerability, Security Goals, Security Services and mechanisms. Conventional substitution and transposition ciphers, One-time Pad, Block cipher and Stream Cipher, Steganography. Classical Encryption Techniques.	
Unit-2	**08 Hours**
Symmetric and Asymmetric Cryptographic Techniques: DES, AES, RSA algorithms. Hash Functions Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS), Proof Of Digital Signature Algorithm.	
Unit-3	**08 Hours**
Program Security : Nonmalicious Program errors – Buffer overflow, Incomplete mediation, Time-of-check to Time-of- use Errors, Viruses, Trapdoors, Salami attack, Man-in-the- middle attacks, Covert channels.	
Unit-4	**10 Hours**
Security in Networks : Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security, Firewalls – Design and Types of Firewalls, Personal Firewalls, IDS, Email Security – PGP,S/MIME	
Unit-5	**06 Hours**
Administering Security: Security Planning, Risk Analysis, Organizational Security policies. Legal Privacy and Ethical Issues in Computer Security: Protecting Programs and data, Information and the law, Rights of Employees and Employers, Software failures, Computer Crime, Ethical issues in Computer Security, case studies of Ethics.	

Text Books:

- William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
- Michael T. Goodrich and Roberto Tamassia, Introduction to Computer Security, Addison Wesley, 2011.
- William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall,4th edition, 2010.

References:

- Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, Handbook of AppliedCryptography, CRC Press, 2011.

Mobile Application Development

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-III

Subject Code	**MCA-305**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
INTRODUCTION Introduction to mobile applications, Market and business drivers for mobile applications, Difficulties in Mobile Development, Mobile Myths, When to Create an App, Types of Mobile App. Design Constraints for mobile applications, both hardware and software related, Architecting mobile applications, user interfaces for mobile applications, touch events and gestures.	
Unit-2	**08 Hours**
ADVANCED DESIGN Designing applications with multimedia and web access capabilities. Integration with GPS and social media networking applications, Accessing applications hosted in a cloud computing environment, Design patterns for mobile applications, Understanding Application users, Information Design, Achieving quality constraints.	
Unit-3	**08 Hours**
TECHNOLOGY I ANDROID Establishing the development environment Android architecture Android Application Structure, Emulator, Android virtual device, UI design, Fragments, Activity, Services, broadcast receiver, Intents/Filters, Content provider-SQLite Programming, SQLITE open, Helper, SQlite Database, Interaction with server side applications	
Unit-4	**08 Hours**
Advanced ANDROID Using Google Maps, GPS and Wi-Fi Integration, Android Notification, Audio Manager, Bluetooth, Camera and Sensor Integration, Sending SMS, Phone Calls, Publishing Android Application.Introduction to KOTLIN	
Unit-5	**08 Hours**
TECHNOLOGY II IOS Introduction to Objective C iOS features UI implementation Touch frameworks Data persistence using Core Data and SQLite, Action and Outlets, Delegates and Storyboard, Location aware applications using Core Location and Map Kit, Integrating calendar and address book with social media application Using Wifi iPhone marketplace.	

Text Books:

RetoMeier , “Professional Android app development”, Wiley, 2019.

Matt Neuburg, “IOS 13 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics”, O’Reilly, 2019.

Michael Dippery, ”Professional Swift”, Wiley, 2015.

Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012.

Charlie Collins, Michael Galpin and Matthias Kappler, “Android in Practice”, DreamTech, 2012.

Reference Books:

Reto Meier, Ian Lake,”Professional Android, 4th Edition”, Wiley, 2018.

Neil Smyth “Android studio 2.2 Development Essentials 7th Edition” Payload Media 2017.

Murat Yener, OnurDundar, ”Expert Android Studio”, Wiley, 2016.

Jerome Dimarzio “Beginning Android Programming with Android Studio” Wiley Publication, 2016.

David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.

James Dovey and Ash Furrow, “Beginning Objective C”, Apress, 2012.

Paul Deitel, Harvey Deitel, Abbey Deitel and Michel Morgano, “Android for Programmers an App-Driven Approach”, Pearson, 2012.

Data Mining and Data Warehousing

Elective I(a)

As per Choice Based Credit System CBCS)Scheme)

SEMESTER-III

Subject Code	**MCA-306-I(a)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Data Warehousing: Introduction to Data Warehouse and OLAP ,Data Warehouse and DBMS Multidimensional data model ,OLAP operations. Data preprocessing ,Data cleaning ,Data transformation ,Data reduction ,Discretization and generating concept hierarchies.	
Unit-2	**08 Hours**
Data Mining: Introduction, Definition, KDD vs. DM, DBMS vs. DM, DM Techniques, Issues and Challenges in DM, DM Applications. DM algorithms: Classification and Prediction - Parametric and non-parametric technology: Bayesian classification, two class and generalized class classification, classification error.	
Unit-3	**08 Hours**
Association rules:Association Rules: Apriori Algorithm, Partition, FP-tree growth algorithms, Generalized association rule. Motivation and terminology,Correlation analysis. **Clustering:** Basic issues in clustering ,Partitioning methods: k-means, K-MEDOID Algorithm ,Hierarchical methods: distance-based agglomerative and divisible clustering , non-hierarchical techniques.	
Unit-4	**08 Hours**
Decision Trees: Decision tree introduction, Tree pruning, Extracting classification rules from decision trees, Decision tree construction algorithms, Decision tree construction with presorting.	
Unit-5	**08 Hours**
Techniques for Data mining: Data Mining software and applications: Introduction to Text mining: extracting attributes (keywords), structural approaches (parsing, soft parsing). Introduction to Web mining: classifying web pages, extracting knowledge from the web Data Mining software and applications.	

Text Books:

1. Alex Berson, Stephen J. Smith, Data Warehousing, Data Mining and OLAP, McGrawHill, 2014
2. D. Hand, H. Mannila, and P. Smyth, Principles of Data Mining, MIT Press, 2011
3. Jiawei Han, MichelineKamber, Data Mining: Concepts and Techniques, Harcourt India Pvt., 2011

References:

1. W. H. Innmon, Building the Data Warehouse, Wiley Computer Publishing, 2005

Big Data Technologies

MCA_306_Elective I(b)

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-II

Subject Code	**MCA-306-I(b)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENT	**Teaching Hours**
Unit-1	**08 Hours**
Understanding Big Data: Introduction, Need, Importance of Big data, Classification of Digital Data, Four Vs, Drivers for Big data, Big data Terminology, Industry examples and Top Challenges Facing Big Data, Responsibilities of data scientists, Technology Challenges for Big data, Convergence of key trends, Big data Architecture. **Big data Applications:** Healthcare, Finance, Advertising, Marketing, Transportation, Education, Government, Cyber Security etc.	
Unit-2	**08 Hours**
Web Analytics: Big data and Marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, Open source technologies, cloud and big data, Crowd Sourcing Analytics, inter and trans firewall analytics.	
Unit-3	**08 Hours**
Hadoop Ecosystem: Introduction to Hadoop, Features of Hadoop, Hadoop Versions, Hadoop Architecture, Introduction to Data Management and Data Access tools: Data Management using Flume, Oozie, Zookeeper; Hive, Pig, Avro, SQOOP for data access. Introduction to Data Processing and Data Storage tools: MapReduce, YARN, HDFS, HBase.	
Unit-4	**08 Hours**
HDFS: HDFS concepts, NameNode, Design working of Hadoop distributed file system (HDFS). **MapReduce:** Introduction, MapReduce workflows, Split, map, combine, scheduling, shuffle and sort YARN. Problems & examples in MapReduce.	
Unit-5	**08 Hours**
NO SQL Data Management: Problem with Relational Database Systems. Introduction to NOSQL, Advantages of NOSQL, SQL versus NOSQL. Aggregate data models, key-value and document data models, relationships, graph databases, schemaless databases.	

Text Books:

- Michele Chambers, Michael Minelli, AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013
- Anil Maheshwari, " Big Data", McGraw-Hill; Second edition, 2019
- SubhashiniChellappanSeemaAcharya, "Big Data and Analytics", Wiley, 2019

References:

- ArshdeepBahga, Vijay Madisetti, "Big Data Analytics: A Hands-On Approach", VPT, 2018
- NandhiniAbirami R, SeifedineKadry, Amir H. Gandomi, BalamuruganBalusamy, "Big Data: Concepts, Technology, and Architecture", Wiley, 1st edition 2021
- EMC Education Services, " Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", 2015

Soft Computing

Elective I(c)

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-III

Subject Code	**MCA-306-I(c)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENT	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Soft Computing Introduction of Hard and Soft Computing, Unique features of Soft computing, Components of Soft computing, Fuzzy Computing, Evolutionary Computation, Genetic Algorithm, Swarm Intelligence, Ant Colony Optimizations, Neural Network, Machine Learning , Associative Memory, Adaptive Resonance Theory, Introduction to Deep Learning.	
Unit-2	**08 Hours**
Neural Networks Introduction and Architecture: Neuron, Nerve structure and synapse, Artificial Neuron and its model, Neural network architecture: single layer and multilayer feed forward networks, recurrent networks. Back propagation networks architecture: perceptron model, solution, single layer artificial neural network, multilayer perception model; back propagation learning methods, back propagation algorithm, applications.	
Unit-3	**08 Hours**
Fuzzy Logic Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion, Membership functions, interference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzyfications & Defuzzificataions, Fuzzy Inference Systems, applications.	
Unit-4	**08 Hours**
Genetic Algorithms Traditional optimization and search techniques, Genetic Algorithms: Basic concepts of GA, working principle, procedures of GA, Process flow of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.	
Unit-5	**08 Hours**
Hybrid Systems Integration of neural networks, fuzzy logic and genetic algorithms. GA Based Back Propagation Networks, Fuzzy Back Propagation Networks, Fuzzy Associative Memories, Simplified Fuzzy ARTMAP.	

Text Books:

1. S. Rajasekaran and G.A.VijaylakshmiPai.. Neural Networks Fuzzy Logic, and Genetic Algorithms, Prentice Hall of India 2007.
2. K.H.Lee.. First Course on Fuzzy Theory and Applications, Springer-Verlag.
3. D. K. Pratihar, Soft Computing, Narosa, 2008.
4. J.-S. R. Jang, C.-T. Sun, and E. Mizutani,Neuro-Fuzzy and soft Computing, PHI Learning, 2009.

ReferenceBooks:

1. J. Yen and R. Langari.. Fuzzy Logic, Intelligence, Control and Information, Pearson Education.
2. N.P.Padhy,"Artificial Intelligence and Intelligent Systems" Oxford University Press.
3. Melanie Mitchell, An Introduction to Genetic Algorithms, MIT Press, 2000.
4. Simon Haykin, Neural Networks and Learning Machines, (3rd Edn.), PHI Learning, 2011.

ADA Lab

As per Choice Based Credit System (CBCS) Scheme)
SEMESTER-III

Subject Code	**MCA-351**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Objective: The course is designed to develop skills to design and analyze various algorithms. It aims to strengthen the ability of the students to identify and apply suitable concepts of Analysis and Design of algorithms for the given real world problems. It enables them to gain knowledge in practical applications of various algorithms.

Contents

1. Linear search & binary search, Sorting Techniques
2. Single source shortest path-Dijkastra Algorithm
3. Greedy method:-knapsack problem
4. Greedy method minimum cost spanning tree
5. Traveling salesman problem – flow shop scheduling.
6. Dynamic Programming – 0/1 Knapsack
7. Dynamic Programming – traveling salesman problem
8. Backtracking 8-Queens problem
9. Backtracking Sum of Subsets
10. Backtracking – graph coloring – Hamiltonian cycles– knapsack problem

Mobile Application Development Lab

As per Choice Based Credit System (CBCS) Scheme

SEMESTER-III

Subject Code	**MCA-352**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Lab Experiments

1. Develop an application that uses GUI components, Font and Colours.
2. Write an android program to implement activity life cycle using toast messageswith proper positioning
3. Develop an application that uses Layout Managers and event listeners.
4. Write an application that draws basic graphical primitives on the screen.
5. Write an application that basic graphical primitives and animations.
6. Develop an application that makes use of databases.
7. Develop an application that makes use of Notification Manager.
8. Develop a native application that uses GPS location information.
9. Implement an application that creates an alert upon receiving a message
10. Write a mobile application that makes use of feed.
11. Develop a mobile application to send an email.
12. Mini Project using Android Studio

Summer Industrial Training Presentation

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-III

Subject Code	**MCA-353**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Mandatory Summer Training: **45 Working Days Summer Training** during Semester Break, of 100 Marks. Evaluation will be done in Semester-III Examinations.

GENERAL INSTRUCTIONS FOR PREPRATION OF SUMMER INDUSTRIAL TRAINNING PRESENTATION/ REPORT

(i) Cover Page
(ii) Title Page
(iii) Certificate
(iv) Acknowledgement
(v) Table of Contents

1. Introduction

2. Project Specifications
- 2.1 Project Need
- 2.2 Project Overview

3. Specific Requirements
- 3.1 External Interface Requirements
- 3.2 Hardware Interfaces
- 3.3 Software Interfaces
- 3.4 Communications Protocols (Networking Protocols)
- 3.5 Security / Maintainability / Performance

4. Software Product Features
- 4.1 System Architecture
- 4.2 Database Requirements
- 4.3 ER Diagram
- 4.4 Data Flow Diagram
- 4.5 Use Case Diagrams
- 4.6 User Interfaces (Input Forms / Processing Forms/ Search Forms/ Output Forms)
- 4.7 Report Formats

5. Drawbacks and Limitations
6. Proposed Enhancements
7. Conclusion
8. Bibliography
9. Annexure:
- 9.1 User Interface Screens (Optional)
- 9.2 Output Reports with Data (if any)
- 9.3 Sample Program Code

Software Project Management

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-IV

Subject Code	**MCA-401**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Project Management: The management spectrum, the people, the product, the process, the project, critical practices Metrics for Process and Project: Metrics in the process and project Domains, software measurements, metrics for software quality, integrating metrics within software process, metrics for small organizations, establishing a software metrics program. Introduction of Project Management tool: Trello, Jira, Asana, Zoho, Wrike.	
Unit-2	**08 Hours**
Estimation: Project planning Process, software scope and feasibility, resources, software project estimation, empirical estimation models, estimation for object oriented projects, estimation for Agile development and web engineering projects, the make/buy decision.	
Unit-3	**08 Hours**
Project Scheduling: Basic concepts, project scheduling, defining a task set and task network, scheduling, earned value analysis. Risk Management: Reactive V/S proactive Risk Strategies, software risks, Risk identification, Risk projection, risk refinement, risk mitigation, monitoring and management, the RMMM plan Quality Planning: Quality Concepts, Procedural Approach to Quality Management, Quantitative Approaches to Quality Management, Quantitative Quality Management Planning, Setting the Quality Goal, Quality Process Planning, Defect Prevention Planning.	
Unit-4	**08 Hours**
Quality Management: Quality Concepts, Software Quality assurances, software reviews, formal technical reviews, Formal approaches to SQA, Statistical Software Quality assurances, Change Management: software Configuration Management, The SCM repository, SCM Process, Configuration Management for Web Engineering	
Unit-5	**08 Hours**
Project Execution And Closure: Reviews. The Review Process, Planning, Overview and Preparation, Group Review Meeting, Rework and Follow-up, One-Person Review, Guidelines for Reviews in Projects, Project Closure: Project Closure Analysis, The Role of Closure Analysis, Performing Closure Analysis. **Project Monitoring and Control:** Project Tracking, Activities Tracking, Defect Tracking, Issues Tracking, Status Reports, Milestone Analysis, Actual Versus Estimated Analysis of Effort and Schedule, Monitoring Quality.	

Text Books:

- Bob Hughes , Mike Cotterell and Rajib Mall "Software Project Management", 6th Edition, McGraw Hill Edition, 2017.
- PankajJalote, "Software Project Management in practice", 5th Edition, Pearson Education, 2017.
- Murali K. Chemuturi ,Thomas M. Cagley Jr." Mastering Software Project Management: Best Practices, Tools and Techniques", J. Ross Publishing, 2010
- Sanjay Mohapatra, " Software Project Management" , Cengage Learning, 2011

References:

- Dr. P. Rizwan Ahmed, " Software Project Management", 1st Edition, Margham Publications, 2016
- Walker Royce, "Software Project Management, A Unified Framework", 1st Edition, 2006.
- Joel Henry, "Software Project Management", 1st Edition, Pearson Education, 2006.
- PradeepPai, "Project Management",, First Edition, Pearson, 2019

Principles of Management and Information System [Elective-2(a)]

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-IV

Subject Code	**MCA-402-2(a)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Management:An Overview Definition, Concept, Functions, Process, Scope and Significance of Management. Nature of Management, Managerial Roles, Managerial Skills and Activities, Difference between Management and Administration. Significance of Values and Ethics in Management.	
Unit-2	**08 Hours**
Planning & Organizing: Nature and purpose of planning, Significance of Planning, Elements and Steps of Planning, Types of planning, Objectives and Policies Decision Making, Organizing Principles, Span of Control, Departmentalization, Line and Staff Authority &Relationship, Authority, Delegation and Decentralization. Formal and Informal Organizations	
Unit-3	**08 Hours**
Directing & Controlling: Effective Directing, Supervision, motivation theories, motivational techniques, Job Satisfaction, Job Enrichment, Leadership-Concept, Styles and Theories System and Process of Controlling, Concept, Types and Process, Techniques of Controlling, Coordination-Concept, Importance, Principles and Techniques of Coordination, use of computers and IT in Management control	
Unit-4	**08 Hours**
Information System: Data vs. Information vs. Knowledge, Information Systemsmeaning, functions and dimensionsand need. Categorization of Organizational InformationSystems –hierarchical and functional perspective, Interdependence between organization and IS, IS strategies for competitive advantageusing Porter's Five Forces Model and Value Chain Model	
Unit-5	**08 Hours**
Information Systems Management: Planning the Use of IT, Managing the Computing Infrastructure, Enterprise Applications, Developing Business/IT Solutions, Outsourcing, User Rights and Responsibilities, Implementation and Controlling of Information System.	

Text Books:

1.Kenneth Laudon, JaneLaudonEssentials ofManagement Information Systems, PHI Publication, 10th Edition
2.Terry and Franklin, Principles of Management, AITBS Publishers & Distributors, Delhi, Eighth Edition.
3.Joseph L Massie "Essentials of Management", Prentice Hall of India, Fourth Edition, 2003.
4. W.S. Jawadekar, "Management Information Systems", TMH Publication, Latest Edition

Reference Books:

1.PC Tripathi and PN Reddy, "Principles of Management", Tata McGraw-Hill, Fourth Edition 2008.
2.Koontz. Essentials for Management: An International Perspective. Tata McGraw-Hill.
3.Peter Ferdinand Drucker, The Practice of Management, HarperCollins Publishers, 2010.

Machine Learning [Elective-2(b)]

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-IV

Subject Code	**MCA-402-2(b)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction Machine Learning – Machine Learning Foundations,Overview,Applications, Types of Machine Learning – Basic Concepts in Machine Learning – Examples of Machine Learning, Perspectives/Issues in Machine Learning, AI vs. Machine Learning.	
Unit-2	**08 Hours**
Supervised Learning Introduction, Linear Models of Classification – Linear Regression – Logistic Regression – Bayesian Logistic Regression – Probabilistic Models Neural Network-Feed Forward Network Functions – Error Back Propagation – Regularization - Bayesian Neural Networks – Radial Basis Function Networks, Ensemble Methods – Random Forest – Bagging – Boosting.	
Unit-3	**08 Hours**
Unsupervised Learning Clustering – K-Means Clustering – EM (Expectation Maximization) – Mixtures of Gaussians – EM algorithm in General – The Curse of Dimensionality – Dimensionality Reduction – Factor Analysis – Principal Component Analysis – Probabilistic PCA – Independent Component Analysis.	
Unit-4	**08 Hours**
Probabilistic Graphical Models Directed Graphical Models – Bayesian Networks – Exploiting Independence Properties – From Distributions to Graphs – Examples – Markov Random Fields – Inference In Graphical Models – Learning - Naïve Bayes Classifiers – Markov Models – Hidden Markov Models. Undirected graphical Models – Conditional Independence Properties.	
Unit-5	**08 Hours**
Advanced Learning Basic Sampling Method – Monte Carlo, Reinforcement Learning-Introduction-The Learning Task, and Elements of Reinforcement Learning. Computer Vision: Applications of Computer Vision Using Machine Learning: Speech Processing, Natural Language Processing.	

Text Books:

1. Christopher Bishop, “Pattern Recognition and Machine Learning”, Springer 2006
2. EthemAlpaydin, “Introduction to Machine Learning”, Prentice Hall of India, 2005
3. Joel Grus, “Data Science from Scratch- First Principles with Python”, O’Reilly, 2015
4. Tom Mitchell, “ Machine Learning”, McGraw-Hill, 1997

ReferenceBooks:

1. Stephen MarsLand, “Machine Learning-An Algorithmic Perspective”, CRC Press, 2009
2. Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012
3. M. Gopal, “Applied MACHINE LEARNING”, McGraw-Hill, 2018
4. Mark Summerfield, “Programming in Python 3: A Complete Introduction to the Python Language”, Addison Wesley, 2010

Data Science with R [Elective-2(c)]

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-IV

Subject Code	**MCA-402-2(c)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction R: Concept, Advantages of R over Other Programming Languages - R Studio: R command Prompt, R script file, comments – Handling Packages in R: Installing a R Package, Few commands to get started: installed.packages(), package Description(), help(), find.package(), library() - Input and Output – Entering Data from keyboard – Printing fewer digits or more digits – Special Values functions : NA, Inf and –inf.	
Unit-2	**08 Hours**
R Data Types: Vectors, Lists, Matrices, Arrays, Factors, Data Frame – R – Variables, Data types of Variable, R Operators,R Decision Making: if statement, if – else statement, if – else if statement, switch statement – R Loops: repeat loop, while loop, for loop - Loop control statement: break statement, next statement.	
Unit-3	**08 Hours**
R-Function : function definition, Built in functions: mean(), paste(), sum(), min(), max(), seq(), user-defined function, calling a function, calling a function without an argument, calling a function with argument values - R-Strings – Manipulating Text in Data: substr(), strsplit(), paste(), grep(), toupper(), tolower() - R Vectors – Sequence vector, rep function, vector access, vector names, vector math, vector recycling, vector element sorting - R List - Creating a List, List Tags and Values, Add/Delete Element to or from a List, Size of List, Merging Lists, Converting List to Vector - R Matrices – Accessing Elements of a Matrix, Matrix Computations: Addition, subtraction, Multiplication and Division- R Arrays: Naming Columns and Rows, Accessing Array Elements, Manipulating Array Elements, Calculation Across Array Elements - R Factors –creating factors, generating factor levels gl().	
Unit-4	**08 Hours**
Data Frames –Create Data Frame, Data Frame Access, Understanding Data in Data Frames: dim(), nrow(), ncol(), str(), Summary(), names(), head(), tail(), edit() functions - Extract Data from Data Frame, Expand Data Frame: Add Column, Add Row - Joining columns and rows in a Data frame rbind() and cbind() – Merging Data frames merge() – Melting and Casting data melt(), cast(). Loading and handling Data in R: Getting and Setting the Working Directory – getwd(), setwd(), dir() - R-CSV Files - Input as a CSV file, Reading a CSV File, Analyzing the CSV File: summary(), min(), max(), range(), mean(), median(), apply() - Writing into a CSV File – R -Excel File – Reading the Excel file.	
Unit-5	**08 Hours**
Descriptive Statistics: Data Range, Frequencies, Mode, Mean and Median: Mean Applying Trim Option, Applying NA Option, Median - Mode - Standard Deviation – Correlation - Data Visualization: visually Checking Distributions for a single Variable - R – Pie Charts: Pie Chart title and Colors – Slice Percentages and Chart Legend, 3D Pie Chart – R Histograms – Density Plot - R – Bar Charts: Bar Chart Labels, Title and Colors.	
Text Books: • SandipRakshit, R Programming for Beginners, McGraw Hill Education (India), 2017, ISBN : 978-93-5260-455-5. • SeemaAcharya, Data Analytics using R, McGrawHill Education (India), 2018, ISBN: 978-93-5260-524-8.	

Reference Books: • Foster Provost & Tom Fawcett, " Data Science for Business", O' Reilly, 2013 • James Warren and Nathan Marz, "Big Data: Principles and Best Practices of Scalable Realtime Data Systems", Manning Publications, 2015 • Anil Maheshwari, " Data Analytics", McGrawHill Publications, 2017	

Industrial Project

[As per Choice Based Credit System (CBCS) Scheme)
SEMESTER-IV

Subject Code	**MCA-451**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**12**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 06

The industrial project as part of the curriculum will be held in the institute as one of the laboratories. This may be in continuationto the project under taken by the student during industrial training and/or of industrial nature and/or have good industrial significance and/or may be done in collaboration with industry (as per suitability at the institute level).

The evaluation will be done in the institute by one internal examiner and one external examiner (from outside the institute) appointed by RTU.

Guidelines for Submission of Industrial Project

All the candidates of MCA are required to submit a **Final Project Report** based on the work done by him/her during the project period.

THE GUIDE

The Guide for MCA would be a person having MCA with 3 years' experience in academic/Industry.

PROJECT TIME
The MCA Major Projects would be at list 12 Weeks and carries a total of 100 marks. The Project topics should be based on syllabus or as per the requirement of specific industry in sync with the course. Every student has to prepare and submit the project work in a group or separately (Max two students). Plagiarism would not be accepted under any circumstances.

Project Report should compulsorily include the software development/ soft copy should also be submitted in CD along with Hard Bound Project report.

Project Evaluation Guidelines.

The project is evaluated on the basis of following aspects:

Presentation & Software execution: 40% of total marks.

Project report (documentation): 30% of total marks.

Viva-Voce: 30% of total marks.

SUMMARY/ABSTRACT
All students must submit a summary/abstract separately with the project report. Summary, preferably, should be of about 3-4 pages. The content should be as brief as is sufficient enough to explain the objective and implementation of the project that the candidate is going to take up. The write up must adhere to the guidelines and should include the following :

- Name / Title of the Project and about the Problems
- Why is the particular topic chosen?
- Objective and scope of the Project
- Methodology (including a summary of the project)
- Hardware & Software to be used
- Testing Technologies used
- What contribution would the project make?

TOPIC OF THE PROJECT- This should be explicitly mentioned at the beginning of the Synopsis. This being the overall impression on the future work, the topic should be able to corroborate the work.

OBJECTIVE AND SCOPE: This should give a clear picture of the project. Objective should be clearly specified. What the project ends up to and in what way this is going to help the end user has to be mentioned.

PROCESS DISCRIPTION: The process of the whole software system proposed, to be developed, should be mentioned in brief. This may be supported by DFDs / Flowcharts to explain the flow of the information.

RESOURCES AND LIMITATIONS: The requirement of the resources for designing and developing the proposed system must be given. The resources might be in form of the hardware/software or the data from the industry. The limitation of the proposed system in respect of a larger and comprehensive system must be given.

CONCLUSION: The write-up must end with the concluding remarks-briefly describing innovation in the approach for implementing the Project, main achievements and also any other important feature that makes the system stand out from the rest.

The following suggested guidelines must be followed in preparing the Final Project Report:

The industrial project as part of the curriculum will be held in the institute as one of the laboratories. This may be in continuation to the project under taken by the student during industrial training and/or of industrial nature and/or have good industrial significance and/or may be done in collaboration with industry (as per suitability at the institute level). The evaluation will be done in the institute by one internal examiner and one external examiner (from outside the institute) appointed by RTU.

The Project study and development should be on the following lines:

FORMAT OF THE STUDENT PROJECT REPORT ON COMPLETION

1. Cover Page as per specifiedformat
2. Declaration Certificate
3. Acknowledgement
4. Certificate of the Company /Institute
5. Main Report

1. Introducton

    1.1 Objectives
    1.2 Problem description
    1.3 About Organization

2. System Study

2.1 System with limitations
2.2 Significance of the Project
2.3 Beneficiaries of the System
2.4 Feasibility study

3. System Analysis

Requirement Specification

i. Functional Requirement.
ii. Non Functional Requirement.
iii. User Requirement
iv. System Requirement

4. System Design

a) Data Flow Diagram

b) E-R Diagrams

c) Use Case Diagrams

d) Flow Charts

e) Database Tables

f) Input output Forms

5. Development

a) Environment
b) Coding Style
c) Coding Techniques
d) Coding

6. Testing

a. Test cases

7. System Security

b. Checks and Control
c. Encryption, secure

8. Conclusion/Future Enhancement

9. Bibliography

The reports prepared by the students MUST NOT have only definitions of the above mentioned topics but should explicitly state these in the context of the project undertaken. They should submit the actual work done in details.

General instructions about preparation of report

Paper: A4

Font: Times New Roman, Bookman Old Style

Chapter Heading: 16pt, Sub heading: 14, Sub-Sub Headings: 12

Bold Running Matter: 12 pt

Paragraph Gap: 6 Pt Maximum

Line Gap: 1.5

Margins: Left 1.5, Right, Top and Bottom 1 inch

All diagrams/figures and tables should be appropriately numbered.

Submission of Project Report to the University:

The student will submit his/her project report in the prescribed format. The Project Report should include:

- Copy of the Summary/Abstract. To be mailed to college/Institute well in advance mentioning the about future project which would be undertaken.
- Two Hard Bound Copies of the Project Report which is around 80 to 120 pages.
- Soft copy of project on CD/DVD/Pen Drive pasted inside of the back cover of the project report.

Binding & Color code of the report/Thesis

For MCA – IV Semester (Industrial Project work)
Hard Bound Report
Cover/Background of the Page of Project Report – **Sky Blue**
Letters in Black

Cover page

An
Industrial Project Report
on
<"Write title of Project>

SubmittedtotheRajasthanTechnicalUniversity,Kotain

Partialfulfillmentoftherequirementforthedegreeof

MASTER OF COMPUTER APPICATIONS

<Logo of your college> **<RTUlogo>**

Supervisor Submitted By:

<Name> <Name of Candidate >

Designation Enrolment No.: .....

<Nameofyour college>

Affiliatedto

Rajasthan Technical University,
Kota(Rajasthan)-324010

Month and Year

Candidate's Declaration

I hereby declare that the work, which is being presented in the MCA-451, Instrial Project , entitled **"**.....(Title).....**"**in partial fulfilment for the award of Degree of "Master of Computer Applications" in Deptartment of Computer Applications **submitted to the** .....(Name of College)....., Rajasthan Technical University is a record of my own work carried under the Guidance of Shri/ Dr. ....., Deptartment of Computer Applications,.....(Name of College)..... .

I have not submitted the matter presented in this Project Report any where for the award of any other Degree.

<Name and Signature of Candidate>

Enrolment No.: .....

.....(Name of College)....,

Name(s) of Supervisor(s)

.....

.....

<college Name>
<name of Department >

Certificate

Date:

This is to certify that the Industrial Project (MCA-451) work entitled "*name of the project*'' submitted by "*name of student***"** (RTU Roll No. ……)to the Department Of Computer Science and Application of <college name> has been examined and evaluated.

The Project work has been prepared as per the regulations of Rajasthan Technical University, Kota and qualifies to be accepted in partial fulfillment of the requirement for the degree of MCA (Master of Computer Applications).

Signature of the student

Supervisor/Guide
(Name with Designation)

External Examiner
(Name with Designation)

Head of Institution/Principal

On Original Company Letter Head

Ref No…….. Date:

Certificate

This is to certify that **your name (RTU Roll No.)** is/was undertraining from _____ (**startdate**) to _____(**enddate**)undermysupervisioninpartialfulfillmentof therequirementforthe award of the Degree of **Master of Computer Applications**.

Duringthis period he /she has workedon……. ("**Project Name**") as a …..(**Role of student**).

TrainingIncharge/Project Leader/HR

(Seal/Sign and Name with Designation)

MCA (Master of Computer Applications)

MCA SYALLABUS YEAR-II SESSION 2021-22
YEAR-II

1. III-Semester (Second Year)

S No	Category	Credit
1	Theory	18
2	Practical	03
3	SODECA	02
	Total	**23**

III-Semester (Second Year) MCA Year 2 - Semester III								
Theory								
S. No.	**Course Code**	**Course Title**	**Hours**		**Marks**			**Credits**
			L	**P**	**IA**	**ETE**	**Total**	
1	MCA-301	Cloud Computing	3		30	70	100	3
2	MCA-302	Analysis and Design of Algorithm	3		30	70	100	3
3	MCA-303	Artificial Intelligence	3		30	70	100	3
4	MCA-304	Information Security	3		30	70	100	3
5	MCA-305	Mobile Application Development	3		30	70	100	3
6	MCA-306	Elective 1	3		30	70	100	3
Practical								
1	MCA-351	ADA Lab		2	30	70	100	01
2	MCA-352	Mobile Application Development Lab		2	30	70	100	01
3	MCA-353	Summer Industrial Training Presentation		2	30	70	100	01
4		SODECA						02
Total					**270**	**630**	**900**	**23**

L= Lecture, **P** = Practical, **IA** = Internal Assessment, **ETE** = End Term Exam

Elective -1:

a) Data Mining and Warehousing
b) Big Data Technologies
c) Soft Computing

2. IV-Semester (Second Year)

S No	Category	Credit
1	Theory	06
2	Practical	06
3	SODECA	02
	Total	**14**

MCA Year 2 - Semester IV								
Theory								
S. No.	**CourseCode**	**Course Title**	**Hours**		**Marks**			**Credits**
			L	**P**	**IA**	**ETE**	**Total**	
1	MCA-401	Software Project Management	3		30	70	100	3
2	MCA-402	Elective 2	3		30	70	100	3
Practical								
3	MCA-451	Industrial Project		12	30	70	100	06
4		SODECA						02
Total					**90**	**210**	**300**	**14**

L= Lecture, **P** = Practical, **IA** = Internal Assessment, **ETE** = End Term Exam

Note: The industrial project is part of the curriculum will be held in the institute as one of the laboratories. This may be in continuations to the project under taken by the student during industrial training and/or of industrial nature and/or have good industrial significance and/or may be done in collaboration with industry (as per suitability at the institute level).
The evaluation will be done in the institute by one internal examiner and one external examiner (from outside the institute) appointed by RTU.

Elective 2:

a) Principles of Management and Information System
b) Machine Learning
c) Data Science with R

Cloud Computing

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA 301**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Cloud: Cloud Computing at a Glance, Vision of Cloud Computing, Defining a Cloud, Cloud Computing Reference Model. Characteristics and Benefits, Challenges Ahead, Historical Developments, Risks and Approaches of Migration into Cloud ,Types of Clouds, Services models, Cloud Reference Model.	
Unit-2	**08 Hours**
Cloud Architecture: cloud architecture, features and benefits of Servive Models: Software as a Service (SaaS),Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Service providers, challenges and risks in cloud adoption. Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing.	
Unit-3	**08 Hours**
Virtualization: Introduction, Characteristics of Virtualized Environment, Taxonomy of Virtualization Techniques, Virtualization and Cloud computing, Pros and Cons of Virtualization, Technology Examples- VMware and Microsoft Hyper-V. Virtualization of CPU, Memory, I/O Devices, Virtual Cluster ,datacenterand Resources Management.	
Unit-4	**08 Hours**
Securing the Cloud: Cloud Information security fundamentals, Cloud security services, Design principles, Policy Implementation, Cloud Computing Security Challenges, Cloud Computing Security Architecture. Legal issues in cloud Computing. **Data Security in Cloud**: Risk Mitigation , Understanding and Identification of Threats in Cloud, SLA-Service Level Agreements, Trust Management	
Unit-5	**08 Hours**
Defining the Clouds for Enterprise: Storage as a service, Database as a service, Process as a service, Information as a service, Integration as a service and Testing as a service. **Disaster Management in Cloud:** Disasters in the Cloud, Disaster Recovery Planning.	

Text Books:

- San Murugesan, Irena Bojanova, "Encyclopedia of Cloud Computing", Wiley , 2016
- Kai Hawang , GeofreyC.Fox, Jack J. Dongarra, "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things", Morgan Kaufmann, 2013
- RajkumarBuyya, JemesBroberg, A. Goscinski, "Cloud Computing : Principal and Paradigms", Wiley, 2011

References:

- Krutz , Vines, "Cloud Security " , Wiley Pub, 2014
- Velte, "Cloud Computing- A Practical Approach" ,TMH Pub, 2015

Analysis and Design of Algorithm

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA-302**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction - Algorithm definition and specification – Design of Algorithms, and Analysis of Algorithms, Asymptotic Notations, Growth of function: Asymptotic notations Performance Analysis Space complexity, Time complexity, Divide and conquer- General method, applications – Binary search, Merge sort, Quick sort	
Unit-2	**08 Hours**
The Greedy method General method – knapsack problem – minimum cost spanning tree (Prims and Kruskal algorithm) – single source shortest path-DijkastraAlgorithm .	
Unit-3	**08 Hours**
Dynamic Programming – general method – multistage graphs – all pair shortest path – 0/1 Knapsack – traveling salesman problem – flow shop scheduling.	
Unit-4	**08 Hours**
Backtracking: General method – 8-Queens problem – sum of subsets – graph coloring – Hamiltonian cycles– knapsack problem. Branch and bound:- The Method – 0/1 Knapsack problem – traveling sales person.	
Unit-5	**08 Hours**
Parallel models Basic concepts, performance Measures, Parallel Algorithms: Parallel complexity, Analysis ofParallel Addition, Parallel Multiplication and division, parallel Evaluation of GeneralArithmetic Expressions, First-Order Linear recurrence. **NP-hard and NP-complete problems:** Basic Concepts, non-deterministic algorithms, Np-hard graph problems and scheduling problems.	

Text Books:

- AnanyLevitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.
- Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.

References:

- Donald E. Knuth, "The Art of Computer Programming", Volumes 1& 3 Pearson Education,2009.
- Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.

Artificial Intelligence

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-III

Subject Code	**MCA-303**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
General Issues and overview of AI Concept of AI, AI technique, Characteristics of AI applications Problem Solving, Search and Control Strategies General Problem solving, Production systems, and Control strategies, forward and backward chaining Exhaustive searches: Depth first and Breadth first search.	
Unit-2	**08 Hours**
Heuristic Search Techniques Hill climbing, Branch and Bound technique, Best first search and A* algorithm, AND/OR Graphs,Problem reduction and AO* algorithm, Constraint Satisfaction problems, Game Playing Min Max Search procedure.	
Unit-3	**08 Hours**
Knowledge Representation First Order Predicate Calculus, Resolution Principle and Unification, Inference Mechanisms Horn'sClauses, Semantic Networks, Frame Systems , Scripts, ConceptualDependency AI Programming Languages.	
Unit-4	**08 Hours**
Natural Language Processing: Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM – RegularExpressions, Finite-State Automata – English Morphology, Tokenization, Part-of-Speech Tagging, Issues in Part-of-Speech tagging.Semantics and pragmatics-Requirements for representation, Syntax-Driven Semantic analysis, Introduction to syntactic analysis.	
Unit-5	**08 Hours**
Expert Systems Introduction to Expert Systems, Architecture of Expert Systems, Expert System Shells, Knowledge Acquisition, Case Studies of Expert System. **Learning**: Concept of learning, Types of learning.	

Text Books:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill, 3 rd edition, 2009.
2. Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall of India, 1 st edition, 1997.
3. Winston, Patrick, Henry, "Artificial Intelligence", Pearson Education, 3 rd edition, 2004
4. SubhasreeBhattacharjee, "Artificial Intelligence for Student" Shroff Publishers and Distributors Pvt.LTD., 1 st Edition, 2016

ReferenceBooks:

1. Nils J. Nilsson, "Principles of Artificial Intelligence (Symbolic Computation / Artificial Intelligence)", reprint edition, 2014.
2. Stuart Russell, Peter Norvig, "Artificial Intelligence: A Modern Approach", Pearson Education, 3 rd edition, 2010.
3. Daniel Jurafsky, James H. Martin Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.

Information Security

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA 304**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Information Security : Attacks, Vulnerability, Security Goals, Security Services and mechanisms. Conventional substitution and transposition ciphers, One-time Pad, Block cipher and Stream Cipher, Steganography. Classical Encryption Techniques.	
Unit-2	**08 Hours**
Symmetric and Asymmetric Cryptographic Techniques: DES, AES, RSA algorithms. Hash Functions Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS), Proof Of Digital Signature Algorithm.	
Unit-3	**08 Hours**
Program Security : Nonmalicious Program errors – Buffer overflow, Incomplete mediation, Time-of-check to Time-of- use Errors, Viruses, Trapdoors, Salami attack, Man-in-the- middle attacks, Covert channels.	
Unit-4	**10 Hours**
Security in Networks : Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security, Firewalls – Design and Types of Firewalls, Personal Firewalls, IDS, Email Security – PGP,S/MIME	
Unit-5	**06 Hours**
Administering Security: Security Planning, Risk Analysis, Organizational Security policies. Legal Privacy and Ethical Issues in Computer Security: Protecting Programs and data, Information and the law, Rights of Employees and Employers, Software failures, Computer Crime, Ethical issues in Computer Security, case studies of Ethics.	

Text Books:

- William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
- Michael T. Goodrich and Roberto Tamassia, Introduction to Computer Security, Addison Wesley, 2011.
- William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall,4th edition, 2010.

References:

- Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, Handbook of AppliedCryptography, CRC Press, 2011.

Mobile Application Development

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-III

Subject Code	**MCA-305**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
INTRODUCTION Introduction to mobile applications, Market and business drivers for mobile applications, Difficulties in Mobile Development, Mobile Myths, When to Create an App, Types of Mobile App. Design Constraints for mobile applications, both hardware and software related, Architecting mobile applications, user interfaces for mobile applications, touch events and gestures.	
Unit-2	**08 Hours**
ADVANCED DESIGN Designing applications with multimedia and web access capabilities. Integration with GPS and social media networking applications, Accessing applications hosted in a cloud computing environment, Design patterns for mobile applications, Understanding Application users, Information Design, Achieving quality constraints.	
Unit-3	**08 Hours**
TECHNOLOGY I ANDROID Establishing the development environment Android architecture Android Application Structure, Emulator, Android virtual device, UI design, Fragments, Activity, Services, broadcast receiver, Intents/Filters, Content provider-SQLite Programming, SQLITE open, Helper, SQlite Database, Interaction with server side applications	
Unit-4	**08 Hours**
Advanced ANDROID Using Google Maps, GPS and Wi-Fi Integration, Android Notification, Audio Manager, Bluetooth, Camera and Sensor Integration, Sending SMS, Phone Calls, Publishing Android Application.Introduction to KOTLIN	
Unit-5	**08 Hours**
TECHNOLOGY II IOS Introduction to Objective C iOS features UI implementation Touch frameworks Data persistence using Core Data and SQLite, Action and Outlets, Delegates and Storyboard, Location aware applications using Core Location and Map Kit, Integrating calendar and address book with social media application Using Wifi iPhone marketplace.	

Text Books:

RetoMeier , “Professional Android app development”, Wiley, 2019.

Matt Neuburg, “IOS 13 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics”, O’Reilly, 2019.

Michael Dippery, ”Professional Swift”, Wiley, 2015.

Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012.

Charlie Collins, Michael Galpin and Matthias Kappler, “Android in Practice”, DreamTech, 2012.

Reference Books:

Reto Meier, Ian Lake,”Professional Android, 4th Edition”, Wiley, 2018.

Neil Smyth “Android studio 2.2 Development Essentials 7th Edition” Payload Media 2017.

Murat Yener, OnurDundar, ”Expert Android Studio”, Wiley, 2016.

Jerome Dimarzio “Beginning Android Programming with Android Studio” Wiley Publication, 2016.

David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.

James Dovey and Ash Furrow, “Beginning Objective C”, Apress, 2012.

Paul Deitel, Harvey Deitel, Abbey Deitel and Michel Morgano, “Android for Programmers an App-Driven Approach”, Pearson, 2012.

Data Mining and Data Warehousing

Elective I(a)

As per Choice Based Credit System CBCS)Scheme)

SEMESTER-III

Subject Code	**MCA-306-I(a)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Data Warehousing: Introduction to Data Warehouse and OLAP ,Data Warehouse and DBMS Multidimensional data model ,OLAP operations. Data preprocessing ,Data cleaning ,Data transformation ,Data reduction ,Discretization and generating concept hierarchies.	
Unit-2	**08 Hours**
Data Mining: Introduction, Definition, KDD vs. DM, DBMS vs. DM, DM Techniques, Issues and Challenges in DM, DM Applications. DM algorithms: Classification and Prediction - Parametric and non-parametric technology: Bayesian classification, two class and generalized class classification, classification error.	
Unit-3	**08 Hours**
Association rules:Association Rules: Apriori Algorithm, Partition, FP-tree growth algorithms, Generalized association rule. Motivation and terminology,Correlation analysis. **Clustering:** Basic issues in clustering ,Partitioning methods: k-means, K-MEDOID Algorithm ,Hierarchical methods: distance-based agglomerative and divisible clustering , non-hierarchical techniques.	
Unit-4	**08 Hours**
Decision Trees: Decision tree introduction, Tree pruning, Extracting classification rules from decision trees, Decision tree construction algorithms, Decision tree construction with presorting.	
Unit-5	**08 Hours**
Techniques for Data mining: Data Mining software and applications: Introduction to Text mining: extracting attributes (keywords), structural approaches (parsing, soft parsing). Introduction to Web mining: classifying web pages, extracting knowledge from the web Data Mining software and applications.	

Text Books:

1. Alex Berson, Stephen J. Smith, Data Warehousing, Data Mining and OLAP, McGrawHill, 2014
2. D. Hand, H. Mannila, and P. Smyth, Principles of Data Mining, MIT Press, 2011
3. Jiawei Han, MichelineKamber, Data Mining: Concepts and Techniques, Harcourt India Pvt., 2011

References:

1. W. H. Innmon, Building the Data Warehouse, Wiley Computer Publishing, 2005

Big Data Technologies

MCA_306_Elective I(b)

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-II

Subject Code	**MCA-306-I(b)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENT	**Teaching Hours**
Unit-1	**08 Hours**
Understanding Big Data: Introduction, Need, Importance of Big data, Classification of Digital Data, Four Vs, Drivers for Big data, Big data Terminology, Industry examples and Top Challenges Facing Big Data, Responsibilities of data scientists, Technology Challenges for Big data, Convergence of key trends, Big data Architecture. **Big data Applications:** Healthcare, Finance, Advertising, Marketing, Transportation, Education, Government, Cyber Security etc.	
Unit-2	**08 Hours**
Web Analytics: Big data and Marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, Open source technologies, cloud and big data, Crowd Sourcing Analytics, inter and trans firewall analytics.	
Unit-3	**08 Hours**
Hadoop Ecosystem: Introduction to Hadoop, Features of Hadoop, Hadoop Versions, Hadoop Architecture, Introduction to Data Management and Data Access tools: Data Management using Flume, Oozie, Zookeeper; Hive, Pig, Avro, SQOOP for data access. Introduction to Data Processing and Data Storage tools: MapReduce, YARN, HDFS, HBase.	
Unit-4	**08 Hours**
HDFS: HDFS concepts, NameNode, Design working of Hadoop distributed file system (HDFS). **MapReduce:** Introduction, MapReduce workflows, Split, map, combine, scheduling, shuffle and sort YARN. Problems & examples in MapReduce.	
Unit-5	**08 Hours**
NO SQL Data Management: Problem with Relational Database Systems. Introduction to NOSQL, Advantages of NOSQL, SQL versus NOSQL. Aggregate data models, key-value and document data models, relationships, graph databases, schemaless databases.	

Text Books:

- Michele Chambers, Michael Minelli, AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013
- Anil Maheshwari, " Big Data", McGraw-Hill; Second edition, 2019
- SubhashiniChellappanSeemaAcharya, "Big Data and Analytics", Wiley, 2019

References:

- ArshdeepBahga, Vijay Madisetti, "Big Data Analytics: A Hands-On Approach", VPT, 2018
- NandhiniAbirami R, SeifedineKadry, Amir H. Gandomi, BalamuruganBalusamy, "Big Data: Concepts, Technology, and Architecture", Wiley, 1st edition 2021
- EMC Education Services, " Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", 2015

Soft Computing

Elective I(c)

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-III

Subject Code	**MCA-306-I(c)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENT	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Soft Computing Introduction of Hard and Soft Computing, Unique features of Soft computing, Components of Soft computing, Fuzzy Computing, Evolutionary Computation, Genetic Algorithm, Swarm Intelligence, Ant Colony Optimizations, Neural Network, Machine Learning , Associative Memory, Adaptive Resonance Theory, Introduction to Deep Learning.	
Unit-2	**08 Hours**
Neural Networks Introduction and Architecture: Neuron, Nerve structure and synapse, Artificial Neuron and its model, Neural network architecture: single layer and multilayer feed forward networks, recurrent networks. Back propagation networks architecture: perceptron model, solution, single layer artificial neural network, multilayer perception model; back propagation learning methods, back propagation algorithm, applications.	
Unit-3	**08 Hours**
Fuzzy Logic Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion, Membership functions, interference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzyfications & Defuzzificataions, Fuzzy Inference Systems, applications.	
Unit-4	**08 Hours**
Genetic Algorithms Traditional optimization and search techniques, Genetic Algorithms: Basic concepts of GA, working principle, procedures of GA, Process flow of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.	
Unit-5	**08 Hours**
Hybrid Systems Integration of neural networks, fuzzy logic and genetic algorithms. GA Based Back Propagation Networks, Fuzzy Back Propagation Networks, Fuzzy Associative Memories, Simplified Fuzzy ARTMAP.	

Text Books:

1. S. Rajasekaran and G.A.VijaylakshmiPai.. Neural Networks Fuzzy Logic, and Genetic Algorithms, Prentice Hall of India 2007.
2. K.H.Lee.. First Course on Fuzzy Theory and Applications, Springer-Verlag.
3. D. K. Pratihar, Soft Computing, Narosa, 2008.
4. J.-S. R. Jang, C.-T. Sun, and E. Mizutani,Neuro-Fuzzy and soft Computing, PHI Learning, 2009.

ReferenceBooks:

1. J. Yen and R. Langari.. Fuzzy Logic, Intelligence, Control and Information, Pearson Education.
2. N.P.Padhy,"Artificial Intelligence and Intelligent Systems" Oxford University Press.
3. Melanie Mitchell, An Introduction to Genetic Algorithms, MIT Press, 2000.
4. Simon Haykin, Neural Networks and Learning Machines, (3rd Edn.), PHI Learning, 2011.

ADA Lab

As per Choice Based Credit System (CBCS) Scheme)
SEMESTER-III

Subject Code	**MCA-351**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Objective: The course is designed to develop skills to design and analyze various algorithms. It aims to strengthen the ability of the students to identify and apply suitable concepts of Analysis and Design of algorithms for the given real world problems. It enables them to gain knowledge in practical applications of various algorithms.

Contents

1. Linear search & binary search, Sorting Techniques
2. Single source shortest path-Dijkastra Algorithm
3. Greedy method:-knapsack problem
4. Greedy method minimum cost spanning tree
5. Traveling salesman problem – flow shop scheduling.
6. Dynamic Programming – 0/1 Knapsack
7. Dynamic Programming – traveling salesman problem
8. Backtracking 8-Queens problem
9. Backtracking Sum of Subsets
10. Backtracking – graph coloring – Hamiltonian cycles– knapsack problem

Mobile Application Development Lab

As per Choice Based Credit System (CBCS) Scheme

SEMESTER-III

Subject Code	**MCA-352**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Lab Experiments

1. Develop an application that uses GUI components, Font and Colours.
2. Write an android program to implement activity life cycle using toast messageswith proper positioning
3. Develop an application that uses Layout Managers and event listeners.
4. Write an application that draws basic graphical primitives on the screen.
5. Write an application that basic graphical primitives and animations.
6. Develop an application that makes use of databases.
7. Develop an application that makes use of Notification Manager.
8. Develop a native application that uses GPS location information.
9. Implement an application that creates an alert upon receiving a message
10. Write a mobile application that makes use of feed.
11. Develop a mobile application to send an email.
12. Mini Project using Android Studio

Summer Industrial Training Presentation

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-III

Subject Code	**MCA-353**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Mandatory Summer Training: **45 Working Days Summer Training** during Semester Break, of 100 Marks. Evaluation will be done in Semester-III Examinations.

GENERAL INSTRUCTIONS FOR PREPRATION OF SUMMER INDUSTRIAL TRAINNING PRESENTATION/ REPORT

(i) Cover Page
(ii) Title Page
(iii) Certificate
(iv) Acknowledgement
(v) Table of Contents

1. Introduction

2. Project Specifications
- 2.1 Project Need
- 2.2 Project Overview

3. Specific Requirements
- 3.1 External Interface Requirements
- 3.2 Hardware Interfaces
- 3.3 Software Interfaces
- 3.4 Communications Protocols (Networking Protocols)
- 3.5 Security / Maintainability / Performance

4. Software Product Features
- 4.1 System Architecture
- 4.2 Database Requirements
- 4.3 ER Diagram
- 4.4 Data Flow Diagram
- 4.5 Use Case Diagrams
- 4.6 User Interfaces (Input Forms / Processing Forms/ Search Forms/ Output Forms)
- 4.7 Report Formats

5. Drawbacks and Limitations
6. Proposed Enhancements
7. Conclusion
8. Bibliography
9. Annexure:
- 9.1 User Interface Screens (Optional)
- 9.2 Output Reports with Data (if any)
- 9.3 Sample Program Code

Software Project Management

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-IV

Subject Code	**MCA-401**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Project Management: The management spectrum, the people, the product, the process, the project, critical practices Metrics for Process and Project: Metrics in the process and project Domains, software measurements, metrics for software quality, integrating metrics within software process, metrics for small organizations, establishing a software metrics program. Introduction of Project Management tool: Trello, Jira, Asana, Zoho, Wrike.	
Unit-2	**08 Hours**
Estimation: Project planning Process, software scope and feasibility, resources, software project estimation, empirical estimation models, estimation for object oriented projects, estimation for Agile development and web engineering projects, the make/buy decision.	
Unit-3	**08 Hours**
Project Scheduling: Basic concepts, project scheduling, defining a task set and task network, scheduling, earned value analysis. Risk Management: Reactive V/S proactive Risk Strategies, software risks, Risk identification, Risk projection, risk refinement, risk mitigation, monitoring and management, the RMMM plan Quality Planning: Quality Concepts, Procedural Approach to Quality Management, Quantitative Approaches to Quality Management, Quantitative Quality Management Planning, Setting the Quality Goal, Quality Process Planning, Defect Prevention Planning.	
Unit-4	**08 Hours**
Quality Management: Quality Concepts, Software Quality assurances, software reviews, formal technical reviews, Formal approaches to SQA, Statistical Software Quality assurances, Change Management: software Configuration Management, The SCM repository, SCM Process, Configuration Management for Web Engineering	
Unit-5	**08 Hours**
Project Execution And Closure: Reviews. The Review Process, Planning, Overview and Preparation, Group Review Meeting, Rework and Follow-up, One-Person Review, Guidelines for Reviews in Projects, Project Closure: Project Closure Analysis, The Role of Closure Analysis, Performing Closure Analysis. **Project Monitoring and Control:** Project Tracking, Activities Tracking, Defect Tracking, Issues Tracking, Status Reports, Milestone Analysis, Actual Versus Estimated Analysis of Effort and Schedule, Monitoring Quality.	

Text Books:

- Bob Hughes , Mike Cotterell and Rajib Mall "Software Project Management", 6th Edition, McGraw Hill Edition, 2017.
- PankajJalote, "Software Project Management in practice", 5th Edition, Pearson Education, 2017.
- Murali K. Chemuturi ,Thomas M. Cagley Jr." Mastering Software Project Management: Best Practices, Tools and Techniques", J. Ross Publishing, 2010
- Sanjay Mohapatra, " Software Project Management" , Cengage Learning, 2011

References:

- Dr. P. Rizwan Ahmed, " Software Project Management", 1st Edition, Margham Publications, 2016
- Walker Royce, "Software Project Management, A Unified Framework", 1st Edition, 2006.
- Joel Henry, "Software Project Management", 1st Edition, Pearson Education, 2006.
- PradeepPai, "Project Management",, First Edition, Pearson, 2019

Principles of Management and Information System [Elective-2(a)]

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-IV

Subject Code	**MCA-402-2(a)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Management:An Overview Definition, Concept, Functions, Process, Scope and Significance of Management. Nature of Management, Managerial Roles, Managerial Skills and Activities, Difference between Management and Administration. Significance of Values and Ethics in Management.	
Unit-2	**08 Hours**
Planning & Organizing: Nature and purpose of planning, Significance of Planning, Elements and Steps of Planning, Types of planning, Objectives and Policies Decision Making, Organizing Principles, Span of Control, Departmentalization, Line and Staff Authority &Relationship, Authority, Delegation and Decentralization. Formal and Informal Organizations	
Unit-3	**08 Hours**
Directing & Controlling: Effective Directing, Supervision, motivation theories, motivational techniques, Job Satisfaction, Job Enrichment, Leadership-Concept, Styles and Theories System and Process of Controlling, Concept, Types and Process, Techniques of Controlling, Coordination-Concept, Importance, Principles and Techniques of Coordination, use of computers and IT in Management control	
Unit-4	**08 Hours**
Information System: Data vs. Information vs. Knowledge, Information Systemsmeaning, functions and dimensionsand need. Categorization of Organizational InformationSystems –hierarchical and functional perspective, Interdependence between organization and IS, IS strategies for competitive advantageusing Porter's Five Forces Model and Value Chain Model	
Unit-5	**08 Hours**
Information Systems Management: Planning the Use of IT, Managing the Computing Infrastructure, Enterprise Applications, Developing Business/IT Solutions, Outsourcing, User Rights and Responsibilities, Implementation and Controlling of Information System.	

Text Books:

1.Kenneth Laudon, JaneLaudonEssentials ofManagement Information Systems, PHI Publication, 10th Edition
2.Terry and Franklin, Principles of Management, AITBS Publishers & Distributors, Delhi, Eighth Edition.
3.Joseph L Massie "Essentials of Management", Prentice Hall of India, Fourth Edition, 2003.
4. W.S. Jawadekar, "Management Information Systems", TMH Publication, Latest Edition

Reference Books:

1.PC Tripathi and PN Reddy, "Principles of Management", Tata McGraw-Hill, Fourth Edition 2008.
2.Koontz. Essentials for Management: An International Perspective. Tata McGraw-Hill.
3.Peter Ferdinand Drucker, The Practice of Management, HarperCollins Publishers, 2010.

Machine Learning [Elective-2(b)]

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-IV

Subject Code	**MCA-402-2(b)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction Machine Learning – Machine Learning Foundations,Overview,Applications, Types of Machine Learning – Basic Concepts in Machine Learning – Examples of Machine Learning, Perspectives/Issues in Machine Learning, AI vs. Machine Learning.	
Unit-2	**08 Hours**
Supervised Learning Introduction, Linear Models of Classification – Linear Regression – Logistic Regression – Bayesian Logistic Regression – Probabilistic Models Neural Network-Feed Forward Network Functions – Error Back Propagation – Regularization - Bayesian Neural Networks – Radial Basis Function Networks, Ensemble Methods – Random Forest – Bagging – Boosting.	
Unit-3	**08 Hours**
Unsupervised Learning Clustering – K-Means Clustering – EM (Expectation Maximization) – Mixtures of Gaussians – EM algorithm in General – The Curse of Dimensionality – Dimensionality Reduction – Factor Analysis – Principal Component Analysis – Probabilistic PCA – Independent Component Analysis.	
Unit-4	**08 Hours**
Probabilistic Graphical Models Directed Graphical Models – Bayesian Networks – Exploiting Independence Properties – From Distributions to Graphs – Examples – Markov Random Fields – Inference In Graphical Models – Learning - Naïve Bayes Classifiers – Markov Models – Hidden Markov Models. Undirected graphical Models – Conditional Independence Properties.	
Unit-5	**08 Hours**
Advanced Learning Basic Sampling Method – Monte Carlo, Reinforcement Learning-Introduction-The Learning Task, and Elements of Reinforcement Learning. Computer Vision: Applications of Computer Vision Using Machine Learning: Speech Processing, Natural Language Processing.	

Text Books:

1. Christopher Bishop, “Pattern Recognition and Machine Learning”, Springer 2006
2. EthemAlpaydin, “Introduction to Machine Learning”, Prentice Hall of India, 2005
3. Joel Grus, “Data Science from Scratch- First Principles with Python”, O’Reilly, 2015
4. Tom Mitchell, “ Machine Learning”, McGraw-Hill, 1997

ReferenceBooks:

1. Stephen MarsLand, “Machine Learning-An Algorithmic Perspective”, CRC Press, 2009
2. Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012
3. M. Gopal, “Applied MACHINE LEARNING”, McGraw-Hill, 2018
4. Mark Summerfield, “Programming in Python 3: A Complete Introduction to the Python Language”, Addison Wesley, 2010

Data Science with R [Elective-2(c)]

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-IV

Subject Code	**MCA-402-2(c)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction R: Concept, Advantages of R over Other Programming Languages - R Studio: R command Prompt, R script file, comments – Handling Packages in R: Installing a R Package, Few commands to get started: installed.packages(), package Description(), help(), find.package(), library() - Input and Output – Entering Data from keyboard – Printing fewer digits or more digits – Special Values functions : NA, Inf and –inf.	
Unit-2	**08 Hours**
R Data Types: Vectors, Lists, Matrices, Arrays, Factors, Data Frame – R – Variables, Data types of Variable, R Operators,R Decision Making: if statement, if – else statement, if – else if statement, switch statement – R Loops: repeat loop, while loop, for loop - Loop control statement: break statement, next statement.	
Unit-3	**08 Hours**
R-Function : function definition, Built in functions: mean(), paste(), sum(), min(), max(), seq(), user-defined function, calling a function, calling a function without an argument, calling a function with argument values - R-Strings – Manipulating Text in Data: substr(), strsplit(), paste(), grep(), toupper(), tolower() - R Vectors – Sequence vector, rep function, vector access, vector names, vector math, vector recycling, vector element sorting - R List - Creating a List, List Tags and Values, Add/Delete Element to or from a List, Size of List, Merging Lists, Converting List to Vector - R Matrices – Accessing Elements of a Matrix, Matrix Computations: Addition, subtraction, Multiplication and Division- R Arrays: Naming Columns and Rows, Accessing Array Elements, Manipulating Array Elements, Calculation Across Array Elements - R Factors –creating factors, generating factor levels gl().	
Unit-4	**08 Hours**
Data Frames –Create Data Frame, Data Frame Access, Understanding Data in Data Frames: dim(), nrow(), ncol(), str(), Summary(), names(), head(), tail(), edit() functions - Extract Data from Data Frame, Expand Data Frame: Add Column, Add Row - Joining columns and rows in a Data frame rbind() and cbind() – Merging Data frames merge() – Melting and Casting data melt(), cast(). Loading and handling Data in R: Getting and Setting the Working Directory – getwd(), setwd(), dir() - R-CSV Files - Input as a CSV file, Reading a CSV File, Analyzing the CSV File: summary(), min(), max(), range(), mean(), median(), apply() - Writing into a CSV File – R -Excel File – Reading the Excel file.	
Unit-5	**08 Hours**
Descriptive Statistics: Data Range, Frequencies, Mode, Mean and Median: Mean Applying Trim Option, Applying NA Option, Median - Mode - Standard Deviation – Correlation - Data Visualization: visually Checking Distributions for a single Variable - R – Pie Charts: Pie Chart title and Colors – Slice Percentages and Chart Legend, 3D Pie Chart – R Histograms – Density Plot - R – Bar Charts: Bar Chart Labels, Title and Colors.	
Text Books: • SandipRakshit, R Programming for Beginners, McGraw Hill Education (India), 2017, ISBN : 978-93-5260-455-5. • SeemaAcharya, Data Analytics using R, McGrawHill Education (India), 2018, ISBN: 978-93-5260-524-8.	

Reference Books: • Foster Provost & Tom Fawcett, " Data Science for Business", O' Reilly, 2013 • James Warren and Nathan Marz, "Big Data: Principles and Best Practices of Scalable Realtime Data Systems", Manning Publications, 2015 • Anil Maheshwari, " Data Analytics", McGrawHill Publications, 2017	

Industrial Project

[As per Choice Based Credit System (CBCS) Scheme)
SEMESTER-IV

Subject Code	**MCA-451**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**12**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 06

The industrial project as part of the curriculum will be held in the institute as one of the laboratories. This may be in continuationto the project under taken by the student during industrial training and/or of industrial nature and/or have good industrial significance and/or may be done in collaboration with industry (as per suitability at the institute level).

The evaluation will be done in the institute by one internal examiner and one external examiner (from outside the institute) appointed by RTU.

Guidelines for Submission of Industrial Project

All the candidates of MCA are required to submit a **Final Project Report** based on the work done by him/her during the project period.

THE GUIDE

The Guide for MCA would be a person having MCA with 3 years' experience in academic/Industry.

PROJECT TIME
The MCA Major Projects would be at list 12 Weeks and carries a total of 100 marks. The Project topics should be based on syllabus or as per the requirement of specific industry in sync with the course. Every student has to prepare and submit the project work in a group or separately (Max two students). Plagiarism would not be accepted under any circumstances.

Project Report should compulsorily include the software development/ soft copy should also be submitted in CD along with Hard Bound Project report.

Project Evaluation Guidelines.

The project is evaluated on the basis of following aspects:

Presentation & Software execution: 40% of total marks.

Project report (documentation): 30% of total marks.

Viva-Voce: 30% of total marks.

SUMMARY/ABSTRACT
All students must submit a summary/abstract separately with the project report. Summary, preferably, should be of about 3-4 pages. The content should be as brief as is sufficient enough to explain the objective and implementation of the project that the candidate is going to take up. The write up must adhere to the guidelines and should include the following :

- Name / Title of the Project and about the Problems
- Why is the particular topic chosen?
- Objective and scope of the Project
- Methodology (including a summary of the project)
- Hardware & Software to be used
- Testing Technologies used
- What contribution would the project make?

TOPIC OF THE PROJECT- This should be explicitly mentioned at the beginning of the Synopsis. This being the overall impression on the future work, the topic should be able to corroborate the work.

OBJECTIVE AND SCOPE: This should give a clear picture of the project. Objective should be clearly specified. What the project ends up to and in what way this is going to help the end user has to be mentioned.

PROCESS DISCRIPTION: The process of the whole software system proposed, to be developed, should be mentioned in brief. This may be supported by DFDs / Flowcharts to explain the flow of the information.

RESOURCES AND LIMITATIONS: The requirement of the resources for designing and developing the proposed system must be given. The resources might be in form of the hardware/software or the data from the industry. The limitation of the proposed system in respect of a larger and comprehensive system must be given.

CONCLUSION: The write-up must end with the concluding remarks-briefly describing innovation in the approach for implementing the Project, main achievements and also any other important feature that makes the system stand out from the rest.

The following suggested guidelines must be followed in preparing the Final Project Report:

The industrial project as part of the curriculum will be held in the institute as one of the laboratories. This may be in continuation to the project under taken by the student during industrial training and/or of industrial nature and/or have good industrial significance and/or may be done in collaboration with industry (as per suitability at the institute level). The evaluation will be done in the institute by one internal examiner and one external examiner (from outside the institute) appointed by RTU.

The Project study and development should be on the following lines:

FORMAT OF THE STUDENT PROJECT REPORT ON COMPLETION

1. Cover Page as per specifiedformat
2. Declaration Certificate
3. Acknowledgement
4. Certificate of the Company /Institute
5. Main Report

1. Introducton

    1.1 Objectives
    1.2 Problem description
    1.3 About Organization

2. System Study

2.1 System with limitations
2.2 Significance of the Project
2.3 Beneficiaries of the System
2.4 Feasibility study

3. System Analysis

Requirement Specification

i. Functional Requirement.
ii. Non Functional Requirement.
iii. User Requirement
iv. System Requirement

4. System Design

a) Data Flow Diagram

b) E-R Diagrams

c) Use Case Diagrams

d) Flow Charts

e) Database Tables

f) Input output Forms

5. Development

a) Environment
b) Coding Style
c) Coding Techniques
d) Coding

6. Testing

a. Test cases

7. System Security

b. Checks and Control
c. Encryption, secure

8. Conclusion/Future Enhancement

9. Bibliography

The reports prepared by the students MUST NOT have only definitions of the above mentioned topics but should explicitly state these in the context of the project undertaken. They should submit the actual work done in details.

General instructions about preparation of report

Paper: A4

Font: Times New Roman, Bookman Old Style

Chapter Heading: 16pt, Sub heading: 14, Sub-Sub Headings: 12

Bold Running Matter: 12 pt

Paragraph Gap: 6 Pt Maximum

Line Gap: 1.5

Margins: Left 1.5, Right, Top and Bottom 1 inch

All diagrams/figures and tables should be appropriately numbered.

Submission of Project Report to the University:

The student will submit his/her project report in the prescribed format. The Project Report should include:

- Copy of the Summary/Abstract. To be mailed to college/Institute well in advance mentioning the about future project which would be undertaken.
- Two Hard Bound Copies of the Project Report which is around 80 to 120 pages.
- Soft copy of project on CD/DVD/Pen Drive pasted inside of the back cover of the project report.

Binding & Color code of the report/Thesis

For MCA – IV Semester (Industrial Project work)
Hard Bound Report
Cover/Background of the Page of Project Report – **Sky Blue**
Letters in Black

Cover page

An
Industrial Project Report
on
<"Write title of Project>

SubmittedtotheRajasthanTechnicalUniversity,Kotain

Partialfulfillmentoftherequirementforthedegreeof

MASTER OF COMPUTER APPICATIONS

<Logo of your college> **<RTUlogo>**

Supervisor Submitted By:

<Name> <Name of Candidate >

Designation Enrolment No.: .....

<Nameofyour college>

Affiliatedto

Rajasthan Technical University,
Kota(Rajasthan)-324010

Month and Year

Candidate's Declaration

I hereby declare that the work, which is being presented in the MCA-451, Instrial Project , entitled **"**.....(Title).....**"**in partial fulfilment for the award of Degree of "Master of Computer Applications" in Deptartment of Computer Applications **submitted to the** .....(Name of College)....., Rajasthan Technical University is a record of my own work carried under the Guidance of Shri/ Dr. ....., Deptartment of Computer Applications,.....(Name of College)..... .

I have not submitted the matter presented in this Project Report any where for the award of any other Degree.

<Name and Signature of Candidate>

Enrolment No.: .....

.....(Name of College)....,

Name(s) of Supervisor(s)

.....

.....

<college Name>
<name of Department >

Certificate

Date:

This is to certify that the Industrial Project (MCA-451) work entitled "*name of the project*'' submitted by "*name of student***"** (RTU Roll No. ……)to the Department Of Computer Science and Application of <college name> has been examined and evaluated.

The Project work has been prepared as per the regulations of Rajasthan Technical University, Kota and qualifies to be accepted in partial fulfillment of the requirement for the degree of MCA (Master of Computer Applications).

Signature of the student

Supervisor/Guide
(Name with Designation)

External Examiner
(Name with Designation)

Head of Institution/Principal

On Original Company Letter Head

Ref No…….. Date:

Certificate

This is to certify that **your name (RTU Roll No.)** is/was undertraining from _____ (**startdate**) to _____(**enddate**)undermysupervisioninpartialfulfillmentof therequirementforthe award of the Degree of **Master of Computer Applications**.

Duringthis period he /she has workedon……. ("**Project Name**") as a …..(**Role of student**).

TrainingIncharge/Project Leader/HR

(Seal/Sign and Name with Designation)

RTU

MBA Syllabus

Rajasthan Technical University, Kota

2021-22

FOURTH SEMESTER MBA

TEACHING SCHEME & SYLLABUS

FOURTH SEMESTER MBA TEACHING SCHEME

S. No.	Course Type	Paper Code	Paper Title	No of Sessions		Credits	Internal / Minimum Marks	External/ Minimum Marks	Total
				Per Semester	Per Week				
			Theory Courses : Dual Specialization is proposed: Six Subjects (Three from each group) The student will get specialized in two Majors.						
1	PEC1			24	2	3	30/12	70/28	100
2	PEC2			24	2	3	30/12	70/28	100
3	PEC3			24	2	3	30/12	70/28	100
4	PEC4			24	2	3	30/12	70/28	100
5	PEC5			24	2	3	30/12	70/28	100
6	PEC6			24	2	3	30/12	70/28	100
7	MCC		Audit Course	12	1	0	30	70	100*
8	PEC	M-417	Major Lab (Functional Area I)	24	2	1.5	60/30	40/20	100
9	PEC	M-418	Major Lab (Functional Area II)	24	2	1.5	60/30	40/20	100
10	REW	M-419	Project Work	48	4	3			100
11	SODECA		Social Outreach, Discipline & Extra Curriculum Activities	-				100/40	100
			Total for IV Semester	**252**	**21**	**24**	**330**	**670**	**1000**

***Note:** Marks of audit course will not be considered for credit purpose

List of Functional Areas for MBA (Fourth Semester)

Group A [FINANCE]		
S. No.	**Subject Code**	**Subject Title**
Semester IV		
1	**M-410**	Financial Derivatives
2	**M-411**	Financial System, Institutions and Instruments
3	**M-412**	Mergers, Acquisitions and Corporate Restructuring
4	**M-413**	Behavioural Finance
Group B [MARKETING]		
S. No.	**Subject Code**	**Subject Title**
Semester IV		
1	**M-420**	Consumer Behavior
2	**M-421**	Services Marketing
3	**M-422**	International Marketing Management
4	**M-423**	Rural Marketing
5	**M-424**	Digital and Social Media Marketing
6	**M-425**	Customer Relationship Management
Group C [HUMAN RESOURCE MANAGEMENT]		
S. No.	**Subject Code**	**Subject Title**
Semester IV – Electives		
1	**M-430**	Employee Relations & Labour Laws
2	**M-431**	Performance Management System
3	**M-432**	Cross Cultural Human Resource Management
4	**M-433**	Human Resource Analytics
Group D [OPERATIONS & SUPPLY CHAIN MANAGEMENT]		
IV Semester		
1	**M-440**	Supply Chain and Logistics Management
2	**M-441**	Project Management
3	**M-442**	Service Operations Management
5	**M-443**	Technology Management
Group E [INFORMATION TECHNOLOGY MANAGEMENT]		
S. No.	**Subject Code**	**Subject Title**
IV Semester		
1	**M- 450**	Software Project Management
2	**M- 451**	Managing Digital Innovation and Transformation
3	**M- 452**	Artificial Intelligence for Managers
4	**M- 453**	Emerging Technologies in Data Base Management

Group F [BUSINESS ANALYTICS]		
S. No.	**Subject Code**	**Subject Title**
IV Semester		
1	**M- 460**	Data Mining for Business Decisions
2	**M- 461**	Data Visualization for Managers
3	**M- 462**	Business Forecasting
4	**M- 463**	Functional Analytics

M-417 Major Lab (Functional Area I)

M-418 Major Lab (Functional Area II)

(The guidelines for the Major Lab Functional Area I & Functional Area II are common for III & IV Semester)

Finance (Group A)

Course Objectives:	1. To understand the financial industry milieu. 2. To gain practical exposure to understand intricacies of the financial sector.
Learning Outcomes:	1. Students will be able to use finance software for day to day trading and other financial applications. 2. Students will be able to comprehend and provide solution to the financial aspects of a company. 3. Students will have knowledge about fund raising from different sources and they will be able to analyze whether M&A for a company will be useful.

S.No.	Component		Assessment Criteria
1.	**Practical Component/ Field Based Assignments**		**Manual and Presentation**
	M -410 FINANCIAL DERIVATIVES		
	Title/Activity	1. Conduct a study on Algorithmic Trading (AT) by gathering data from individuals/ trading firms using it. Prepare a feasibility report as to what extent the AT is useful in earning profits. Study and document different software available on AT and AT trading strategies. 2. Conduct a study of a broking firm engaged in derivatives trading. Analyse the trading of derivative instruments in these firms. Also study trading strategies adopted by these firms.	
	M-411 FINANCIAL SYSTEM, INSTITUTIONS AND INSTRUMENTS		
	Title/Activity	1. Analyse and prepare a report on the monetary policy measures adopted by the RBI keeping in view liquidity position of the money market for past two years. 2. Prepare a report on the financial instruments used by	

		the Indian Corporate sector for both short term and long-term fund raising. Highlight the most popular financial instruments used by the Indian companies.	
	M-412 MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING		
	Title/Activity	1. Identify and analyze a case of Merger/Substantial Acquisition involving at least one Indian company. Evaluate pre-merger and post-merger on below mentioned criteria: a) Share Market price momentum and reactions b) Position of Financial statements in terms of the consolidated values of the companies c) Impact on EPS of the companies d) Employee Base and Senior Management Restructuring e) Product Portfolio/Service Portfolio offered f) Competitive Landscape for the companies Involved g) Extent of Market/ Geographical Presence 2. Analyse the facts of any one recent case in which a company has acquired a competitive start up. Analysis has to be done in terms of, objectives, valuation mechanism, financing method used, capital restructuring, expected outcome and actual post-merger outcome.	
	M-413 BEHAVIOURAL FINANCE		
	Title/Activity	1. Conduct a survey of 50 respondents dealing in equity trading to study biasness in buying and selling decisions of shares. 2. Study and document a report on market bubble events and the pre and post market bubble reaction of investors dealing in equity.	

2.	**Hands on Practice on any one Marketing Software**	1.Eka's derivative trading software. 2.Derivagem. 3.Mint. 4. DealRoom. 5.Resolution Software for Derivatives.	**Manual (IT Based)**
3.	**Book Reviews**	1. Palak Shah(2020)The Market Mafia: Chronicle of India's High-Tech Stock Market Scandal & The Cabal That Went Scot-Free, Notion Press 2. Alice Schroeder (2009),The Snowball: Warren Buffett and the Business of Life, Bantam 3. Don Tapscott, (2018), Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies is Changing the World, Penguin	**Presentation**

Books Recommended

1. Donald De Pamphilis, Merger Acquisitions and Other Restructuring Activities, Elsevier India , 9th
2. M.Y. Khan, Indian Financial System, Tata McGraw Hill Education, 9th Edition, 2015.
3. Rajiv Srivastava Derivatives & Risk Management, Oxford University Press, second edition, 2014.
4. Edwin Burton and Sunit Shah, Behavioral Finance: Understanding the Social, Cognitive, and Economic Debates, Wiley Finance, 2013.

Marketing (Group B)

Course Objectives:	1. To develop an appreciation and understanding of the unique challenges inherent in managing marketing efforts students will have hands on experience on tools and strategies that address these challenges. 2. To integrate the various psychological, social and cultural concepts and build a useful conceptual framework that would equip the students for practical application of strategic marketing decisions.
Learning Outcomes:	1. Gain knowledge, skills and competencies to design marketing strategies in order to manage a marketing programme efficiently. 2. Develop strong foundation of applied knowledge, concepts and analytical skills for effective marketing of products and services. 3. Foster critical thinking, analytical and problem-solving skills in customer acquisition and retention.

S.No.	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	M-420-CONSUMER BEHAVIOUR	
	Title/Activity	1. Conduct interview of around 50 respondents on their last three restaurant visits and the situation in which they visited the restaurant. What can you conclude about the impact of the situation on their consumption behaviour? Can you draw an impact of the individual on consumer behaviour? 2. Conduct Focus Group interview with your batchmates on the issue of suggesting improvements in any newly launched product or service. As a researcher how can you use the collected information through this process and write a report on same.

	M-421-SERVICES MARKETING	
	Title/Activity	1. Develop a simple questionnaire designed to measure the key components of customer expectations(i.e., desired, adequate and predicted service, the zone of tolerance, etc). Conduct 10 interviews with key target customers of a service of your choice to understand the structure of their expectations. Based on your findings, develop recommendations for firms offering this service. 2. Identify firms from three different service sectors where the service environment is a crucial part of the overall value proposition. Analyse and explain in detail the value that is being delivered by the service environment in each of the three firms.
	M-422-INTERNATIONAL MARKETING MANAGEMENT	
	Title/Activity	1. Conduct a trade analysis for India and identify country's major trading partners. Find out the impact of economic integration on trade patterns and relate it with the concept of scanning the international economic environment. 2. Contact an office of a multinational firm in your town and discuss with the company's marketing manager about the different research techniques and marketing strategies adopted by them in different countries. Identify the difference in research techniques and marketing strategies adopted in India vis a vis other countries.
	M-423-RURAL MARKETING	
	Title/Activity	1. Visit minimum of five retail stores in nearby villages and understand the product strategy, pricing strategy and distribution strategy being adopted by FMCG marketers for selling products like, soaps, shampoos, tea, etc. 2. Choose one brand popular in Rural India and Prepare a questionnaire covering 4A's related to the chosen brand and interview minimum 10 rural consumers and present your findings.

	M-424-DIGITAL AND SOCIAL MEDIA MARKETING	
	Title/Activity	1. Make a list of 20 Indian companies which are using Internet extensively for marketing and consumer engagement. List the different Internet tools they use. Make a note on how the companies benefitted from the usage with reference to CRM, online advertising, IMC, consumer segmentation, sales and trade promotion. 2. Track the online presence of five product brands. Trace how each brand has used the online world to do the following: a. Create a brand identity in the online sphere b. Generate brand salience and resonance c. Develop brand personality d. Develop consumer-brand relationship.
	M-425-CUSTOMER RELATIONSHIP MANAGEMENT	
	Title/Activity	1. As manager of a Media company engaged in news broadcast, you are supposed to conduct a study for designing a set of programs and address related issues that may build customer loyalty among your viewers. What course of action would you adopt and how would you carry out the study? 2. Conduct a study on Private Banks and make a comparative study of the top three players about their customer Retentions Strategies.
2.	**Hands on Practice on any one software**	1. Marketo Lead Management. 2. Five9 Virtual Call Centre. 3. Plan Plus Online. 4. Racker RMS CRM. 5. Digital Marketing Boot Camp
3.	**Book Review (Any one)**	1. Damodaran H. (2021), Broke to Breakthrough: The Rise of India's Largest Private Dairy Company, Penguin Viking. (India-Hatsun Agro). 2. Sitapati S. (2019), THE CEO FACTORY: Management Lessons from Hindustan Unilever, Juggernaut. 3. Piyush P.(2016), Pandeymonium, Penguin Random House India (Indian ads and Ogilvy).

Books Recommended

1. Michael R. Solomon, Consumer Behavior: Buying, Having, Being, Pearson Publication, (2020).
2. Jayanta Chatterjee Christopher Lovelock, & Jochen Wirtz, Services Marketing, 8/e Eighth Edition, Pearson Education(2020) .
3. Cateora R Philip & Graham L John: International Marketing, McGraw Hill; 18th edition; (2019).
4. Pradeep Kashyap, Rural Marketing, Third Edition, ,Pearson Education India (2016).
5. Aleksej Heinze, Gordon Fletcher, Tahir Rashid & Ana Cruz, Digital And Social Media Marketing A Results-Driven Approach, Taylor and Francis publication, (2020).
6. Max Fatouretchi, The Art of CRM: Proven strategies for modern customer relationship management, Packt Publishing, (2019).

Human Resource Management (Group C)

Course Objectives:	1. To provide opportunity to students to interact with industry leaders & HR professionals and learn through practical activities and assignments. 2. To imbibe research acumen and develop inter-personal, analytical and cross-cultural skills in HRM.
Learning Outcomes:	1. Stimulate thinking on rationale behind the laws and their enforcement problems. 2. Ability to understand and develop various training and non training solutions to improve employee performance. 3. Develop skills for effective diversity management and ability to understand the issues and challenges involved in managing a diverse workforce

S.No.	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	M-430-EMPLOYEE RELATIONS AND LABOUR LAWS	
	Title/Activity	1. Locate a local unionized organization. Interview both a manager and a union employee to determine the level of satisfaction each has with the employment relationship. What type of union activity/inactivity contributes to the position? 2. Investigate in depth any union in an organization and examine its member base and a recent activity. Does it appear that union has become more or less effective in any way?
	M-431-PERFORMANCE MANAGEMENT SYSTEM	
	Title/Activity	1. Examine the methods used to monitor employee performance in any five organizations of your choice from at least two different sectors. **2.** Visit any organization of your choice to: • Analyze the various performance criteria (standards) established in the organization. • Investigate the problems associated with Performance Appraisal in the organization. • Identify the characteristics of Performance Management System of the organization. • Examine how appraisal interviews are conducted in the organization.

	M-432-CROSS CULTURAL HUMAN RESOURCE MANAGEMENT	
	Title/Activity	1. Identify a firm preferably an MNC and highlight the strengths and weaknesses of workforce diversity over there? Also discuss the firm's strategies to manage workforce diversity. 2. Also discuss the challenges faced by that MNC in deploying employees from one country to another and what strategies do they adopt in overcoming those challenges.
	M-433-HUMAN RESOURCE ANALYTICS	
	Title/Activity	1. Identify the important HR metrics used in any company of your choice. 2. Ask students to collect manpower data of your institute and prepare HR Dashboards.
2.	**Hands on Practice on any one software**	1. Sentrifugo 2. WaypointHR 3. Staff Squared 4. Teamdeck 5. Bitrix24
3.	**Book Review (Any one)**	1. HR Rising!!: From Ownership to Leadership Steve Browne 2. The HR Scorecard Brian Becker, Mark Huselid, Dave Ulrich 3. Predictive HR Analytics: Mastering the HR Metric Kirsten & Martin Edwards

Books Recommended:

1. Sinha, P. R. N., Sinha, I. B., & Shekhar, S. P. (2017). Industrial Relations, Trade Unions and Labour Legislation. Pearson Education India.
2. Armstrong, M. (2020). Performance management: Key strategies and practical guidelines.
3. Aswathappa, K., & Dash, S. (2020). International Human Resource Management|. McGraw-Hill Education.
4. Bhattacharyya, D. K. (2017). HR Analytics: Understanding Theories and Applications. SAGE Publications India Pvt Limited.

Operations & Supply Chain Management (Group D)

Course Objectives:	1. To develop analytical approach among students regarding manufacturing related concepts and tools. 2. To understand how Managers, take decisions – strategic, tactical and operations - and how they are taken in different areas of Operations & Supply Chain Management.
Learning Outcomes:	1. Students will be able to Identify and Analyze Business Models, Business Strategies and, corresponding Competitive Advantage. 2. Students will be able to Formulate and implement Warehouse Best Practices and Strategies. 3. Students will be able to plan, Warehouse and Logistics operations for optimum utilization of resources.

S.No.	Component	
1.	**Practical Component/ Field Based Assignments**	
	M-440- SUPPLY CHAIN & LOGISTICS MANAGEMENT	
	Title/Activity	1. Prepare a chart for Supply chain network of petroleum, milk products, etc 2. Study of FMCG inventory management at any retail warehouse/ retail mall.
	M-441- PROJECT MANAGEMENT	
	Title/Activity	1. Study and prepare a report on Project Cost Estimation Techniques for a manufacturing Project. 2. Study and prepare a report for Project Scheduling & Tracking Tools - An Overview for a Construction Project
	M-442- SERVICE OPERATIONS MANAGEMENT	
	Title/Activity	1. Being a manager inventory in a retail sector mall, analyse the FMCG items stocking philosophy so that stock out condition and expiration does not exists. 2. Being a Head of Marketing for a new fertilizer plant, establish the SCM up to retailers, keeping in mind that entire daily production is distributed to retailers and also sold to the customers on one day lead basis.

	M-443- TECHNOLOGY MANAGEMENT	
	Title/Activity	1. Study and prepare a report for BPR for Motor cycle vehicles for fuel efficiency design and parameters. 2. Study and analyse any two products of ITC or HUL for its recognition as world class leaders for lean manufacturer & 5S practice.
2.	**Hands on Practice on any one software**	Students must be given exposure to some of the following Softwares: 1. Forecasting software, 2. PLM, 3. Prima Vera, 4. REPLICON, 5. Mavenlink
3.	**Book Review (Any one)**	1. Christopher, M. (2016). Logistics & supply chain management. Pearson Uk. 2. Slack, N., Chambers, S., & Johnston, R. (2010). Operations management. Pearson education. 3. Gaither Norman., Frazier Greg (2015), Operations Management, Cengage Learning.

Books Recommended:

1. Russell, R. S., & Taylor-Iii, B. W. (2008). Operations management along the supply chain. John Wiley & Sons.
2. Harrison, F., & Lock, D. (2017). Advanced project management: a structured approach. Routledge.
3. Parker, D. (2012). Service operations management: the total experience. Edward Elgar Publishing.
4. Narayanan, V. K. (2001). Managing technology and innovation for competitive advantage. Pearson Education India.

Information Technology Management (Group E)

Course Objectives:	1. Prepare students to meet their needs within an organizational and societal context through selection, creation, application, integration and administration of computing technologies. 2. Prepare students to become skilled in Artificial Intelligence, Internet and Web technologies, and project management, and have a strong grasp of business concepts and technical communications.
Learning Outcomes:	1. Develop skills for observing, analyzing and understanding how the role of digital technology is rapidly shifting, from being a driver of marginal efficiency to being an enabler of innovation. 2. Utilize interpersonal skills to negotiate and communicate effectively with both technical and non-technical stakeholders verbally and in writing. 3. Comprehend how technological transformation has enabled business to remodel their own resources, their relationship with consumers and the services they offer.

S.No.	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	M-450 SOFTWARE PROJECT MANAGEMENT	
	Title/Activity	1. Develop a project for a company which explains the risks for their on going projects on and also develop a risk mitigation strategy and activities for the risks mentioned for the project. 2. Visit any manufacturing company to develop a task network for the upcoming or currently ongoing projects. Establish milestones for the project. Define the critical path for the network using project management tools.
	M-451 MANAGING DIGITAL INNOVATION AND TRANSFORMATION	
	Title/Activity	1. The students have to pick one company/industry that deploys any of the technology enablers such as Artificial Intelligence (AI)/Machine Learning/IoT/Block Chain Technology or any other related aspect(s). For example Amazon uses AI to anticipate when an ad has value; Google uses natural language processing to automate translation. For this assignment, choose a company that uses any of the above mentioned

		technology enablers in a creative way to derive value creation, value capture, or its operating model. You may focus on the use of technology enabler(s) as a service, or as an enhancement of a process for some part of its business. 2. Students should use customer-level data of actual customer purchases offline and online to track changes in consumer behaviour over time due to digital or technological transformation. The students have to make use of two industries of different domains like pharmacy and grocery or cosmetics and clothing etc. This project contributes to Omni channel retailing by offering a way to understand changes in customer behaviours over time
	M-452 ARTIFICIAL INTELLIGENCE FOR MANAGERS	
	Title/Activity	1. Students should visit companies which deal in real estate and see their datasets. The dataset for this project might contain the prices of houses in different areas of the city, construction cost, prices of flats etc. Similar datasets may be studied from sites like the UCI Machine Learning Repository. On the basis of the data obtained predict the selling price of a new home in a particular city. 2. Students who are planning to work in the finance sector, this project can help them get a great insight into different sections of the sector. They need to visit corporates dealing with share market and see its working and collect data. They can get different kinds of data sets. The feedback cycles of the stock market are short, so it helps in validating predictions. You can try to predict 6-month price movements of a stock by using the data you get from the organization's provided reports in this AI project.
	M-453 EMERGING TECHNOLOGIES IN DATA BASE MANAGEMENT	
	Title/Activity	1. Analyze database requirements for a departmental store. Visit different departments such as grocery, confectionery, cosmetics, clothing, bakery, crockery etc. to gather requirements. Record the business requirements and document them. On the basis of the requirements gathered, draw entity relationship diagram(s) and design a normalized database for the software for automation of the inventory and billing process of the store.

		2. Survey the types of advanced database models applied in different domains in organizations working in your area of study. Generate a report depicting the evolution, expanse and extent of use of these databases.
2.	**Hands on Practice on any one software**	1. Python 2. Click Up 3. 42OAI 4. A sana 5. Mycollab
3.	**Book Review (Any one)**	1. IT Project Management: Infamous Failures, Classic Mistakes, And Effective Practices: Top Reasons Why Software Projects Fail Paperback – Import, 21 May 2021, by Bertram Rangel, Publisher: Independently Published (21 May 2021)), Paperback: pag 138 es 2. Artificial Intelligence: The Insights You Need from Harvard Business Review (HBR Insights Series) Paperback – Illustrated, 4 October 2019, by Harvard Business Review, Thomas H. Davenport, Publisher: Harvard Business Review Press; Illustrated edition (4 October 2019), Paperback: pages 192 3. Neoskilling for Digital Transformation and the Artificial Intelligence Revolution Paperback – 1 January 2018, by S. Ramachandran, Prof. L. Prasad.

Books Recommended:

1. Bob Hughes, Mike Cotterell and Rajib Mall "Software Project Management", 6th Edition, McGraw Hill Edition, 2017.
2. Michael Lewrick, Patrick Link, Lary Leifer, The Design Thinking Playbook: Mindful Digital Trasformation of Teams, Product, Services, Businesses and Ecosystems, Wiley, 2018.
3. Russell, S., Norvig, P. "Artificial Intelligence: A Modern Approach", Third Edition, Prentice Hall, 2010.
4. Thomas Connolly and Carolyn Begg, "Database Systems: A Practical Approach to Design, Implementation, and Management, Addison Wesley, 6th Edition, 2014.

Business Analytics (Group F)

Course Objectives:	1. Gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making. 2. Learn how to use and apply tools to solve business problems.
Learning Outcomes:	1. Interpret results/solutions and identify appropriate course of action for a given managerial problem or opportunity. 2. Apply practical experience in IT projects developed through assessment projects for real world clients focussing on technology auditing and recommendations, and system development 3. Translate results of business analytic projects into effective courses of action.

S.No.	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	M-460 DATA MINING FOR BUSINESS DECISIONS	
	Title/Activity	1. In this project, Students may use customer level data of actual customer purchases offline and online to perform association rule mining on data sets. Explore various options available for preprocessing data and apply different discretization filters on numerical attributes on association rule algorithm. Study the generated rules. Derive interesting insights and observe the effect of discretization in the rule generation process. Students can gather data from two different industries of different domains. 2. Students will collect data from one company/ Industry; identify the requirement of regression analysis on specific parameters. Use Regression analysis using Excel or other data mining tool to derive probabilistic conclusions about any event by analysis of historical data. Data trees and linear regressions are some data mining algorithms which must be used.

	M-461 DATA VISUALIZATION FOR MANAGERS	
	Title/Activity	1. Collect data from a company to analyze customer behavior. Data should contain browsing history and customer engagement time, purchases in online stores, registering in events, time to visit etc. Analyze the behavior of customers using data visualization tools. 2. Visit the industry and discuss with maintenance team regarding 'looking for insights' part which are on the verge of break down. Understand how maintenance team helps the analytical team. Create a project which describes the connections between machinery failure and certain events that trigger them, using data visualization tools
	M-462 BUSINESS FORECASTING	
	Title/Activity	1. The Students can pick one or more companies working on marketing and promotion of disposable tableware/ sanitizer / plastic packaging material to forecast the requirements and suggest changes in products for manufacturing companies. For this assignment, choose good marketing companies, conduct surveys to collect data for changes in existing one and new products. Apply analysis tools and techniques for prediction. IT tools may also be used for data collection. 2. This project focuses on the use of smart products and solar panels for rural/urban India, the students should collect data for the needs of smart mobile phones/ smart televisions / solar panels /smart devices in rural India. Students can use different platforms for data collection like forms, electronic shop sales data situated in rural/urban areas, and some marketing campaigns, etc. The customer-level data of actual customers interested in smart devices and the solar panel should be gathered. Purchases both offline and online should be included to track changes in customer behavior over time due to digital or technological transformations. The students may make use of forecasting models and apply various techniques learned in the course for regression and errors.

	M-463 FUNCTIONAL ANALYTICS	
		1. Collect data from Financial Asset Management Companies which have a portfolio management system using which an investor can calculate the Net Asset Value (NAV) of their investments in the stock market. Identify types of assets, stocks and mutual funds. Stock has a name, price and quantity. Mutual funds have a name and a list of stocks. Each investor of the firm has a named portfolio. The investor can ask the portfolio management system to get the NAV by invoking the operation on portfolios to calculate the NAV for his/her total investments that he/she made in several stocks and mutual funds. Analyze the portfolios using financial analytics tools. 2. Create HR Metrics dashboard for a company by collecting data regarding monitoring human capital, significant changes or development within the teams, employee turnover and employee retention.
2.	**Hands on Practice on any one software**	1. Weka 2. Orange 3. Rapid Miner 4. Python 5. GapMinder
3.	**Book Review (Any one)**	1. Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures Paperback – 31 March 2019, by Claus O. Wilke (Author), Publisher: Shroff/O'Reilly; First edition,31 March 2019, Paperback: 392 pages 2. Winning in the Digital Age: Seven Building Blocks of a Successful Digital Transformation Hardcover – 24 February 2021, by Nitin Seth, Publisher: Penguin Enterprise,24 February 2021, Penguin Random House India, Hardcover: 544 pages 3. Bridgital Nation: Solving Technology's People Problem Hardcover – 12 October 2019 by N. Chandra sekaran, Roopa Purushothaman, Publisher: Penguin Allen Lane, 12 October 2019, Hardcover: 344 pages

Books Recommended:

1. Jiawei Han & Micheline Kamber, "Data Mining: Concepts & Techniques", Morgan Kaufmann Publishers, 3rd edition, 2002
2. Claus O. Wilke , "Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures", 1st Edition, O Reilly Media, Inc., 2019
3. Michael Gilliland, Len Tashman, Udo Sglavo ,"Business Forecasting: Practical Problems and Solutions", Wiley, 2010

4. Shonna D. Waters, Valerie Streets, Lindsay McFarlane, Rachael Johnson-Murray, "The Practical Guide to HR Analytics: Using Data to Inform, Transform, and Empower HR Decisions", 2018, Society For Human Resource Management.

M-419 PROJECT WORK

Course objectives:

1. To increase proficiency in specific business disciplines; such as human resource management, operations management, marketing, accounting, analytics, economics, finance, and IT.
2. To develop and improve business skills in communication, technology, quantitative reasoning, and teamwork.

Learning Outcomes :

1. Develop work habits communication, interpersonal & other critical skills and attitudes necessary for job success.
2. Acquire employment contacts leading directly to a full-time job following program completion from college.
3. Demonstrate the ability to harness resources by analysing challenges and considering opportunities.

The project work is real life short term corporate study. The candidate will be allotted the project by the faculty of the institute in consultation with the director/principal of the institute.

The problem identified during Projects study should pertain to student's area of specialization. It can be from any one area of specialization. The report will contain the objectives and scope of the study. Research methodology, use, importance of the study, analysis of data collected, conclusions and recommendations. It will contain relevant charts, diagrams and bibliography.

A certificate by the Supervisor of the project certifying the authenticity of the report shall be attached therewith. The student will submit two hard copies of the report to the Head of the MBA program. An external examiner will be selected by the Director/Principal of the institute from the panel of examiners, proposed by BOS and approved by Dean, Faculty of Management Studies (FOMS). The concerned institute will bear the traveling, remuneration, DA and other incidental expenditure of external examiner with recourse to RTU.

There shall be regular internal assessment and a time line to be followed according to the guidelines for project work. The guidelines for project work will be issued separately.

Extra 10 days for Project work will be given to the students after their last working day.

The guidelines for Project Work (M-419) during Fourth Semester MBA

INTRODUCTION:

Project work is an integral part of the academic curriculum of RTU MBA. It is an initiative to bridge the gap between knowledge and its application through a series of interventions that will enable students of RTU MBA program to gain insights and exposure to the industry.

The Project Work has been positioned during fourth semester of the MBA program as it serves the twin purpose of providing critical business insights to students as well providing industry with graduates of a high caliber who are ready to get ahead in the world from day one.

General Guidelines:

A. Nature of Project Work: The student will have to identify a Project Work in a business enterprise that matches the student's area of specialization. Project Work is a combination of In-plant study and a research project. Students are expected to study the functioning of an organization, identify a problem area and provide suggestions to overcome the problems.

B. Duration of Project Work: The Project Work shall be done in fourth semester. Students are expected to take up work such as identifying the organization, finalization of topic and review of literature during the fourth semester and start the Project Work immediately after this.

C. Guide: Internal guide of the Project Work is a full time faculty member working in management department of respective institution with minimum of three years of experience. External guide is from the business organization where the student is carrying out his/her Project Work. Maximum of ten students can work under an internal guide. Internal guide is expected to be in continuous interaction with external guide during the course of the Project.

D. No two students of an institute shall work on the same problem in the same organization.

E. Schedule to be followed before commencement of Project

Activity	**Time-line**	**Remarks**
Identifying the Organization and Problem Identification	1st week of 4th semester.	Student individually identifies an organization and identifies problem for his / her study, according to his / her interest
Problem Statement	2nd week of 4th semester.	His / her interests are discussed with selected guides
Research design	3rd week of 4th semester.	Discussion with internal guide to decide on suitable design for the research
Synopsis preparation	4th week of 4th semester.	Preparation of synopsis* incorporating the Objectives

Presentation of synopsis	5th week of 4th semester.	The student will present Synopsis with the detailed execution plan to the Project committee** who will review and may (a) approve, (b) approve with modification or (c) Reject for fresh synopsis.
Approval status	6th week of 4th semester.	The approval status is submitted to HOD who will officially give concurrence for execution of the Project

***Synopsis: It is a 3 page document / hard copy to be submitted to the HOD with the signatures of Guide and the Student.**

Page 1	Title, contact addresses of student - with details of internal & External Guide
Page 2	Short Introduction with objectives and summary (300 words), Review of articles/literature about the topic with source of information.
Page 3	Time-Activity Chart

****Composition of the Project committee**

1. Director/HOD
2. Domain expert from the department
3. Internal Guide

F. Schedule to be followed during Project

Activity	**Time-line**	**Remarks**
Understanding structure, culture and functioning of the organization.	7th and 8th week of 4th semester.	Student should understand products/ services and problems of the Organization.
Preparation of research instrument for data collection	9th and 10th week of 4th semester.	Discussion with the guide for finalization of research instrument in his/her domain and present the same to the guide.(First presentation)
Data collection	11th and 12th week of 4th semester.	Data collected to be edited, coded, tabulated and presented to the guide for suggestions for analysis. (Second presentation)
Analysis and finalization of report	13th and 14th week of 4th semester.	Students must use appropriate and latest statistical tools and techniques for analyzing the data (It is must to use latest statistical packages whose results should be shown in the report) (Third presentation)

Submission of report		Final report should be submitted to the university before one week of the commencement of theory examination.

G. Evaluation:

Project work carries 100 marks consisting of 60 marks for internal evaluation by the internal examiner, 40 marks for external evaluation by external examiner through viva-voce examination.

The Project work Report comprises of 100 marks and will be evaluated by two examiners (external and internal). The evaluation will consist of (1) Project Report evaluation (2) Project Presentation and Viva Voce. The Project Report evaluation will comprise of 60 marks and would be evaluated by internal project guide. The Presentation and Viva Voce would comprise of 40 marks and would be evaluated by two examiners (1 external and 1 internal).

Break-up of components for evaluation of Project Study Report

<table>
<tr><th></th><th colspan="7">Components</th><th>Marks</th><th>Total Marks</th></tr>
<tr><td rowspan="9">Internal Evaluation Criteria</td><td colspan="7">Interaction with Mentor/ faculty supervisor</td><td>10</td><td rowspan="9">60</td></tr>
<tr><td colspan="7">Project daily-activity record</td><td>10</td></tr>
<tr><td colspan="7">Project Report Internal Evaluation: Evaluation Criteria</td><td rowspan="7">40</td></tr>
<tr><td>SN</td><td></td><td>Unsatisfactory</td><td>Satisfactory</td><td>Good</td><td>Excellent</td><td>Score</td></tr>
<tr><td></td><td></td><td>2</td><td>4</td><td>6</td><td>8</td><td></td></tr>
<tr><td>1</td><td>Understanding of Objectives with topic</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Understanding of Reliance of topic</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Interpretation & Analysis</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Presentation</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>Query handling</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="8">External Evaluation Criteria</td><td colspan="7">Project Report External Evaluation: Evaluation Criteria</td><td rowspan="8"></td><td rowspan="8">40</td></tr>
<tr><td>SN</td><td></td><td>Unsatisfactory</td><td>Satisfactory</td><td>Good</td><td>Excellent</td><td>Score</td></tr>
<tr><td></td><td></td><td>2</td><td>4</td><td>6</td><td>8</td><td></td></tr>
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<tr><td>5</td><td>Query handling</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

H. FORMAT OF REPORT:

The Project Work report shall be prepared using word processor Viz., MS word, using Times New Roman font sized 12, on a page layout of A4 size with 1" margin on all sides and 1.5 line spacing. The Project Work report shall not exceed 60-70 pages.

Formats for Project Report

- Format of Cover Page
- Format of certificate by College/Institution
- Format of Declaration Page
- Format of Contents
- Format of List of Tables and Charts
- Format of Bibliography

I. Submission of report:

Students should submit the Project Work report in Hard copy (hard bound) and electronic data form also in PDF file (Un-editable format) to the Institute one week before the commencement of the examination.

J. Publication of research findings:

Students are expected to present their research findings in seminars / conferences / technical fests or publish their research work in journals in association with their internal examiner. Appropriate weightage should be given to this in the internal evaluation of the project report.

Contents of the Project Report

Cover page

A certificate from the Organization (Scanned copy of the certificate)

A certificate from the guide, HOD and Head of the Institution (Scanned copy of the certificate) indicating the bonafide performance of Project by the student. Declaration (Scanned copy of the declaration) – An undertaking by the student to the effect that the work is independently carried out by him/her.

Acknowledgement Table of contents

List of Tables and Graphs Executive summary

Chapter 1 Introduction: Introduction about the Project, Topic chosen for study, Need for the study, Objectives of the study, Scope of the study, Methodology

adopted, Literature review and Limitations of the study

Chapter 2: Industry profile and company profile: (Promoters, Vision, Mission & Quality Policy, Products / Services profile, Areas of Operation, Infrastructure facilities, Competitors' information, SWOT analysis, Future growth and prospects and Financial Statement

Chapter 3: Theoretical background of the study – elaborative information on the subject chosen for better understanding and usage in the analysis.

Chapter 4: Analysis and interpretation of the data Collected with relevant tables and graphs. Results obtained by using statistical tools must be included.

Chapter 5: Summary of Findings, Conclusion and Suggestions / recommendations. Bibliography

Annexure relevant to the project such as figures, graphs, photographs etc.

Project Work report on
(Title of the Report)

BY

(Student Name)
(Roll No)

Submitted to

RAJASTHAN TECHNICAL UNIVERSITY

In partial fulfilment of the requirements for the award of the degree of

MASTER OF BUSINESS ADMINISTRATION

Under the guidance of

INTERNAL GUIDE
(Name)
(Designation)

EXTERNAL GUIDE
(Name)
(Designation)

(Institute Logo)

Department of MBA

(Institute name with Address)

(Batch)

CERTIFICATE

This is to certify that **(Name of the Student)** bearing Roll No (xxxx), is a bonafide student of Master of Business Administration course of the Institute (Batch), affiliated to Rajasthan Technical University, Kota.

Project Work report on "**(Title of Report)**" is prepared by him/her under the guidance of **(Name of the Guide)**, in partial fulfillment of the requirements for the award of the degree of Master of Business Administration of Rajasthan Technical University, Kota, Rajasthan.

Signature of Internal Guide Signature of HOD

Signature of Principal

DECLARATION

I, **(Student Name)** , hereby declare that the Project Work report entitled "(Title) "with reference to "(Organization with place)" prepared by me under the guidance of (Guide Name), faculty of M.B.A Department, (Institute name) and external assistance by **(External Guide Name, Designation and Organization).**

I also declare that this Project work is towards the partial fulfillment of the university regulations for the award of degree of Master of Business Administration by Rajasthan Technical University, Kota.

I further declare that this project is based on the original study undertaken by me and has not been submitted for the award of any degree/diploma from any other University/Institution.

Place: **Signature of the student**

Date:

This shall be the sequence of various pages in the report

- Title
- Certificate
- Abstract
- Acknowledgements
- Table of Contents
  - Executive Summary
  - Definitions and
  - Notations List of
  - Tables
  - List of Figures and
  - Charts Chapter 1
  - Introduction
  - Chapter 2
  - Chapter 7 Conclusions and Directions for further work
  - Bibliography
  - Annexure

TABLE OF CONTENTS

Executive Summary
Definitions and Notations
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List of Figures and Charts

Chapter 1. Introduction..... (Page Number)
Chapter 2. Industry and Company profile..... (Page Number)
Chapter 3. Theoretical Background of the Study ..... (Page Number)
Chapter 4. Data Analysis and interpretation..... (Page Number)
Chapter 5. Summary of Results and Findings ..... (Page Number)
Chapter 6. Suggestions ..... (Page Number)
Chapter 7. Conclusions and Directions for further work..... (Page Number)
Bibliography

Annexure

LIST OF TABLES

Table No	Particulars	Page Numbers
Table 4.1	Table showing ABC Analysis	
Table 4.2	Table showing FSN Analysis	
Table 4.3	Table showing EOQ	
Table 4.4	Table showing Stock of Raw Materials	

LIST OF FIGURES AND CHARTS

Chart No	Particulars	Page Numbers
Chart 4.1 Or Figure 4.1	Graph showing ABC Analysis	
Chart 4.2	Graph showing FSN Analysis	
Chart 4.3	Graph showing EOQ	
Chart 4.4	Graph showing Stock of Raw Materials	
Chart 4.5	Graph showing Raw Materials Turn Over Ratio	

BIBLIOGRAPHY

BOOKS:

Name of the Author, Title of the Book, Name of the Publisher, Edition, year of Publication.

ARTICLES:

Name of the Author, Title of the article, Name of the Journal, Volume Number, Issue Number, Year, Page Number (pp)

WEBLIOGRAPHY

Name of the Author, Title of the article, retrieved on mm/dd/yy, from URL

Finance (Group A)

S. No.	Subject Code	Subject Title
Semester IV		
1.	M-410	Financial Derivatives
2.	M-411	Financial System, Institutions and Instruments
3.	M-412	Mergers, Acquisitions and Corporate Restructuring
4.	M-413	Behavioural Finance

M-410-FINANCIAL DERIVATIVES

OBJECTIVES

1. To know about various aspects and mechanism of derivatives.
2. To understand the structure of Indian derivatives market.
3. To understand derivatives markets and trading mechanism in forward, futures, options and swaps contracts.

LEARNING OUTCOMES

1. Determining the pricing of forwards and futures using cost of carry model.
2. Determining the pricing of options using one step binomial option pricing model and the B-S model.
3. Designing and illustrating a swap arrangement.
4. Making informed decision while using derivatives to mitigate risk.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Financial Derivatives**: Definition, types and classification of financial derivatives, Difference between Forwards and Futures and Futures and Options, Participants in the Derivative Markets.	**3**
UNIT II	**Forward Market**: Forward Contracts, Concept and Features, Classification of Forward Contracts, Forward Trading Mechanism.	**2**
UNIT III	**Futures Markets**: Futures Market Trading Mechanism Specifications of a Futures Contract, The Operation of Margins, Clearing House, Lot Size, Tick Size, Open Interest, Closing out a futures position.	**3**
UNIT IV	**Pricing of Derivatives:** Pricing of Forwards/Futures, Index Futures, Currency Futures, Commodity Futures using Cost of Carry Model, Relationship between Spot Price and Futures Price, Contango and Normal Backwardation Market.	**2**
UNIT V	**The Indian Scenario of Derivatives Markets:** Introduction, Evolution of Derivatives in India. Regulation: Structure of the Derivatives Market, Derivatives Regulation in Indian Stock Market, L.C Gupta committee recommendations.	**3**
UNIT VI	**Interest Rate Futures**: Introduction, Short Term Interest Rate Futures, Pricing A T-Bill future. Long Term Futures Contracts: Application of Interest Rate Futures, Long Hedge, Short Hedge.	**4**
UNIT VII	**Swaps**: Introduction, Features and mechanics of Swaps, Major types of Financial Swaps, Valuation of Interest Rate Swaps and Currency Swaps.	**3**
UNIT VIII	**Options**: Introduction, Options terminology, Types of options, payoffs from options positions, Option valuation: Intrinsic and time value of an option. Pricing of options: Determinants of Option Prices, The Black-Scholes Option Pricing Model, One Step Binomial Option Pricing Model.	**4**

Section B

At least one case study/problem from each unit. Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Study the participation of a hedger, a speculator and an arbitrageur and analyze their strategies in the derivatives market.
- Calculate gain/loss from a marked to market derivative trading account.
- Forecast price of forward/ futures contract using cost of carry model.
- Calculate option pricing of any five NSE listed companies using B-S model for next three months.
- Study and illustrate a swap arrangement.

BOOKS RECOMMENDED

1. John C. Hull and Sankarshan Basu, Options, Future & Other Derivatives, Pearson, 10th edition, 2018.
2. S. Kevin, Commodity and Financial Derivatives, 2nd edition, PHI, EEE, 2014.
3. S.L Gupta, Financial Derivatives: Theory, Concepts and Problems, second edition, PHI, EEE,2017.
4. Sundaram Janakiramanan, Derivatives and Risk Management, Pearson, first edition, 2011.
5. Rajiv Srivastava Derivatives & Risk Management, Oxford University Press, second edition, 2014.
6. S S S Kumar, Financial Derivatives, PHI, EEE.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Derivatives and Quantitative Studies, Emerald.
2. Review of Derivatives Research, Springer.
3. The Journal of Derivatives, Portfolio Management Research.
4. International Journal of Financial Markets and Derivatives, Inderscience Publishers.

M-411-FINANCIAL SYSTEM, INSTITUTIONS AND INSTRUMENTS

OBJECTIVES

1. To acquaint students with the financial system.
2. To introduce students with different financial institutions and markets.
3. To impart knowledge of different financial instruments to students.

LEARNING OUTCOMES

1. Taking informed financial decisions while raising funds from financial markets.
2. Acquaintance with the mechanism of money market.
3. Understanding of functioning of merchant bankers.
4. Fair and in depth understanding of capital and money market instruments.

Section- A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Indian Financial System:** Introduction, Components of the Formal Financial System, functions of a financial system, key elements of a well-functioning financial system.	**2**
UNIT II	**Financial institutions:** Definition of financial institutions, Types of financial institutions – Banking, NBFCs, Development financial institutions, Mutual funds, pension funds Insurance and Housing finance companies.	**3**
UNIT III	**Money Market**: Introduction and meaning, Call/Notice money market, Money market intermediaries, tools for managing liquidity in the money market, money market derivatives.	**3**
UNIT IV	**Money market instruments:** Call/Notice money, T bills, Commercial bills, Commercial papers, Certificate of deposits.	**3**
UNIT V	**Capital Market:** Primary Market - Methods of raising funds from capital market- Public issue**,** Rights issue, Private Placement**,** Preferential Issue. **Secondary market** – NSE and BSE, Secondary market - Role of stock exchanges in India, Depositories and custodians, depository participant.	**6**
UNIT VI	**Capital market instruments:** Meaning, primary and secondary securities, Equity shares, Debentures, preference shares, Derivatives, GDR's, ADR's, IDR's Other quasi equity instruments – Subordinated loans, Convertible bonds, senior debt, Mezzanine financing.	**3**
UNIT VII	**Debt Market**: Introduction, private corporate debt market, PSU Bonds market Government securities market.	**2**

UNIT VIII	**Emerging Issues and Challenges**: Low liquidity and shallowness in financial markets, Ethical issues in Merchant Banking, Effectiveness of regulators like RBI and SEBI in controlling Money market and Capital market.	**2**

Section B

At least one case study/problem from each unit. Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Study any four financial institutions and their role in financial intermediation.
- Study any four latest IPOs and document their listing price along with merchant banker, registrar, bankers to the issue.
- Study any four merchant bankers in India and their role in the public issue.
- Study the process of fund raising in the debt market and its mechanism.
- Conduct a critical analysis of the role of RBI and SEBI in controlling financial markets.

BOOKS RECOMMENDED

1. Bharti V. Pathak, The Indian Financial System, 5th Edition, Pearson, 2018.
2. Frederic S. Mishkin, Stanley G. Eakins, Financial Markets and Institutions, 9th Edition, Pearson, 2018.
3. M.Y. Khan, Indian Financial System, Tata McGraw Hill Education, 9th Edition, 2015.
4. Sarkhel & Salim, Indian Financial Sytem & Financial Market Operations, McGraw Higher Education, 2017.
5. L.M. Bhole, Indian Financial Systems and Markets, Tata McGraw Hill, 2012.
6. Kohn Meir, Financial Institutions and Markets, Oxford University Press, 2013.
7. Rajesh Chakrabarti ,Sankar De ,Capital Markets in India, Sage Publications, First Edition

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Money, Credit and Banking, Wiley Online Library
2. Journal of Finance, Wiley Online Library
3. International Review of Financial Analysis, ScienceDirect.
4. Journal of Financial Economics, Elsevier

M-412 - MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING

OBJECTIVES

1. To explain the concept and significance of using different types of corporate restructuring strategies for achieving business objectives.
2. To explain the principles and practices of Mergers & Acquisitions and their contribution in achieving various corporate objectives.
3. To explain the framework of business valuation and price determination under Purchase and sale contract of Businesses.

LEARNING OUTCOMES

1. Understanding of different types of mergers and acquisitions and the process involved in executing their deals.
2. Develop an ability to understand factors influencing the valuation of a business and different methods used in Business Valuation.
3. Familiarity towards different techniques of corporate restructuring.
4. Basic understanding about regulatory environment of mergers and acquisitions in India.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Corporate Restructuring:** Meaning of corporate restructuring, significance of corporate restructuring, Classification of corporate restructuring. Corporate Restructuring practices adopted in India, Role of SEBI, RBI and Competition Commission of India	**2**
UNIT II	**Introduction to Mergers and Acquisition:** Meaning and definition of Merger and Acquisition, Motives of Merger and Acquisitions, Expectations of different stakeholders from Merger and Acquisition deals, Reasons for buying a Business, Reasons for selling a Business, Types of Mergers and Acquisitions, Difference between Merger and Acquisitions, Factors contributing to success and failure of Merger & Acquisition Deal.	**3**
UNIT III	**Execution Process of Merger &Acquisition Deals :** Process of Mergers & Acquisitions Due diligence – Concept and significance of Due Diligence in Merger and Acquisition Deal. Process of Due Diligence- Steps in Due Diligence- Planning Phase, Data Collection Phase, Data Analysis Phase, Data Reporting& Discussion Phase Deal Negotiation – Factors discussed before and after finalizing the deal, Causes of Dispute at time of negotiation and execution of terms of deal	**4**

UNIT IV	**Corporate Valuation-An Introduction**: Concept of Valuation, Objectives of Corporate Valuation, Corporate V/s Equity Valuation, Factors influencing value of a business, Principles of Business Valuation, Over Valuation and Under Valuation, Different types of values - Fair Market Value, Fair Value, Book Value, Intrinsic Value, Replacement Value, Liquidation Value, Going Concern Value, Equity Interest Value, Insurable Value.	**3**
UNIT V	**Corporate Valuation (Practical Perspective)**: Approaches of Business Valuation- Asset-based approaches, Earning value approaches, Market value approaches Exchange Ratio-Concept & Significance of Swap Ratio, Determinants of Swap Ratio, Methods of Calculation of Swap Ratio.	**4**
UNIT VI	**Post-Merger Integration Planning and & Legal Considerations:** Factors considered in Post-merger Integration Planning – HRM issues, Political and cultural compatibility, management interdependencies and autonomy, Problems faced in integration, rules for effective integration post-merger Basic understanding Regulatory Framework for Merger and Acquisitions in India (only introductory overview).	**3**
UNIT VII	**Takeovers**: Concept, Classification of Takeover, Benefits and Limitations of takeover, Friendly v/s Hostile Takeover, Defensive strategies for hostile takeover, regulatory framework of Substantial Acquisition of Shares and Takeover in India (case study based).	**3**
UNIT VIII	**International Merger & Acquisition:** Overview of International M&A activity, Opportunities and threats involved in International M&A, Contribution of International M&A in growth and expansion of businesses, Impact of various macro factors on International M&A Deals. Benefits and Limitations of International M&A deals, recommendation for effective cross-border M&A.	**2**

Section B

At least one case study/problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Study of any two cases each of successful and failed merger deals and prepare a brief report on factors contributing the success & failure of such deals.
- Prepare a list of items to be negotiated in a merger deal and discuss under a mock negotiation round as sellers and buyers in the class
- Read and analyse the contents of any one sample Merger & Acquisition Deal.
- Compute the value of business any one Indian listed company using suitable method of business valuation.
- Compare and analyse the features of a Domestic and Cross Border Mergers & Acquisition using one real case of each involving an Indian company.

BOOKS RECOMMENDED

1. Kavita Shetty, Sharad R. Kale and Rajinder S. Aurora, Mergers and Acquisitions, Oxford University Press, 2014.
2. Donald De Pamphilis, Merger Acquisitions and Other Restructuring Activities, Elsevier India , 9th
3. Enrique R. Arzac, Valuation for Mergers, Buyouts & Restructuring, Wiley India (P) Ltd., Second Edition
4. Prasant Godbole , Mergers, Acquisitions and Corporate Restructuring , Vikas Publication , Latest Edition
5. Rabi Narayan Kaur and Minakshi, Mergers Acquisitions & Corporate Restructuring Strategies & Practices, Taxmann Publications , 2017
6. J. Fred Weston, Mark L. Mitchell, J. Harold Mulherin, Takeovers, Restructuring and Corporate Governance, Pearson Education, 2014
7. Kamal Ghosh Ray, Mergers and Acquisitions: Strategy, Valuation and Integration, PHI Learning Private Limited , Latest Edition
8. Vishwanath S. R. & Chandrashekar Krishnamurti, Mergers, Acquisitions and Corporate Restructuring, Sage Publications, 2008

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Finance, Wiley Online Library
2. The Review of Financial Studies, Oxford Academic
3. Journal of Banking & Finance, Elsevier
4. Research Reports on corporate restructuring published by PWC and Deloitte

M-413 BEHAVIOURAL FINANCE

OBJECTIVES

1. To acquaint students with aspects of Behavioural finance.
2. To familiarize with the tools of Behavioural finance in financial decision making.
3. To understand how investors perceive market for investments.

LEARNING OUTCOMES

1. The students should be able to apply logic and reasoning in making investment decisions.
2. Apply traits of Behavioural finance so that investors can take more prudent financial decisions.
3. Use knowledge about anomalies and biases in designing investment strategies.
4. Identifying market bubble scenario and its implications in investment decisions.

Section- A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Meaning, nature, scope and history of Behavioural Finance; Comparison between Behavioural Finance and Standard Finance; Are financial markets efficient? Limits to arbitrage-Fundamental Risk, Noise Trader Risk, Behavioural Finance scenario in India.	**3**
UNIT II	**Behaviour and Decision Making:** Cognitive Bias, Emotional Bias, Concept of bounded rationality. beliefs and heuristics-Preferences: Prospect Theory, Ambiguity aversion, Loss aversion, Framing, Non-consequentialism: Disjunction Effect.	**3**
UNIT III	Theories of Behavioural Finance: Asymmetric information, Ego centricity, Human Behavioral Theories. **Heuristics:** Familiarity, Ambiguity Aversion Diversification, Functional Fixation Status Quo, Endowment Effect **Representativeness:** Innumeracy, Probability matching and conjunction fallacy, Base Rate Neglect, Availability and Salience, Anchoring.	**4**
UNIT IV	**Bias:** Interaction amongst biases Outcomes of biases Dealing with biases Overcoming the biases and debiasing **Cognitive Biases**: Self-Deception, Framing, Overconfidence, Miscalibration, better than average effect, overoptimism Causes: illusion of knowledge, control, understanding, skill, Self-attribution, Confirmation, Representativeness, Recency. **Emotional Biases:** Regret, Hindsight, Denial, Loss aversion, Affinity, Self-control.	**4**

UNIT V	**Behavioural aspects of Investing:** Behavioural Portfolio theory, Psychographic models, Sound Investment Philosophy.	**2**
UNIT VI	**Value Investing**: Central tenets of value investing Evidence and prospects of value investing. **Neuro finance**: Neural processes during financial decision-making Future of Neuro finance Adaptive Market Hypothesis.	**3**
UNIT VII	**Anomalies:** Fundamental anomalies, Accounting Based Anomalies, Calendar Anomalies, Technical anomalies: Value v/s Growth, size, equity premium myopia.	**2**
UNIT VIII	**Market Bubbles**: Identification and causes, investor behaviour during bubbles, case study of prominent market bubbles/scams.	**3**

Section B

At least one case study/problem from each unit. Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Analyse a case study on market bubble and its implications on the market.
- Prepare a questionnaire-based survey comprising 50 respondents to understand their perception towards investments.
- Prepare a report on anomalies taking a time period of two years.
- Prepare a decision-making process of value investing and document it.
- Conduct a survey of 50 respondents to judge the level of biasness towards investment.

BOOKS RECOMMENDED

1. Prasanna Chandra, Behavioural Finance, McGraw Hill, 2020, 2nd edition.
2. Sujata Kapoor, Jaya Mamta Prasad, Sage, 2019. 5th edition.
3. M. M. Sulphey, Behavioural Finance, PHI, 2014, 1st edition.
4. Parag Parikh, Value Investing and Behavioural Finance, McGraw Hill, 2009. 2nd edition.
5. James Montier, Behavioural Finance: Insights into Irrational Minds and Markets, Wiley Finance,2008.
6. Lucy Ackert and Richard Deaves, Understanding Behavioral Finance, Cengage Learning, India Edition2012.
7. Sujata Kapoor, Jaya Mamta Prosad, Behavioural Finance, Sage Publications, 2019

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Behavioral Finance, Taylor & Francis.
2. Journal of Behavioral and Experimental Finance, Elsevier.
3. Review of Behavioral Finance, Emerald Publishing.
4. Review of Behavioral Finance, Wiley Online Library.

Marketing (Group B)

S.No.	Subject Code	Subject Title
Semester IV		
1.	M-420	Consumer Behavior
2.	M-421	Services Marketing
3.	M-422	International Marketing Management
4.	M-423	Rural Marketing
5.	M-424	Digital and Social Media Marketing
6.	M-425	Customer Relationship Management

M-420-CONSUMER BEHAVIOUR

OBJECTIVES

1. To develop a comprehensive picture of the consumer psychology in order to explain consumer motivation, learning, personality, perception, and attitude formation.
2. To develop an understanding of consumers' social and cultural settings to examine how group involvement and membership influence one's actions as a consumer.
3. To integrate the various psychological, social and cultural concepts and build a useful conceptual framework that would equip the students for practical application of consumer behaviour principles on strategic marketing decisions.

LEARNING OUTCOMES

1. To identify the dynamics of human behaviour and the basic factors that influence the consumers' decision process.
2. To demonstrate how concepts may be applied to marketing strategy.
3. To explore and compare the core theories of consumer behaviour in both consumer and organisational markets.
4. To appraise models of Consumer Behaviour and determine their relevance to particular marketing situations.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Consumer Behavior:** Introduction to Consumer Behavior, Nature & Psycho-Demographics of Indian Consumers, Consumer Movement in India, Rights & Responsibilities of consumers and Benefits of consumerism.	**3**
UNIT II	**Individual Determinants of Consumer Behavior I:** Motivation, Personality, Consumer Perception. **Individual Determinants on Consumer Behaviour II:** Learning theories and their applications, Brand loyalty, Brand extensions. Consumer behaviour and society.	**5**
UNIT IV	**Social and Cultural Determinants:** Indian Perspective on Culture Factors affecting culture, Role of customs, values and beliefs on Consumer Behaviour. **Subculture:** Cross-cultural consumer analysis: Problems and Strategies in India.	**3**
UNIT V	**Group Influences**: Family buying decision & marketing implications. **Reference Groups:** Understanding the power & benefits of reference groups, Factors that affect reference group influence, Types of reference groups, Celebrities, Endorsements and Marketing Implications.	**5**

UNIT VI	**Consumer Decision Making Models:** Models of decision making, Diffusion of innovations: Diffusion Process, Adoption Process.	**1**
UNIT VII	**Organisational Buying:** Differences between Industrial Markets and Consumer Market, Differences between Organizational and Consumer Buying, Buying Decisions in Organizational Buying Process; Types of Decision Making, Organization Buyer's Decision-Making Process.	**5**
UNIT VIII	**Consumer Behavior Analysis and Marketing Strategy:** Consumer Behavior and Product Strategy, Pricing Strategy, Distribution Channel Strategy, Promotion Strategy.	**2**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Find three advertisements that appeal to the need for power, affiliation and achievement and discuss their effectiveness. Rewrite these for persons in different levels of Maslow's Hierarchy?
- Students can visit a mall and unorganised retail outlets and observe the behaviour of consumers of different demographic segments while buying different categories of goods. Come back to class and present the findings/observations, followed with a group discussion.
- Choose five recent successful FMCG Advertisement campaigns and identify their insights through consumer interviews. Then, present your findings to the class.
- Conduct a survey on youth to find the influencing factors in their purchase of mobiles, shoes, bags etc. There are now plenty of advertisements regarding most products – how do they deal with this information overload?
- Students can carry out a primary, qualitative/quantitative research on any dimension related to consumer behaviour.
- Students can identify how marketers are addressing the various components and stages of the decision-making process.

BOOKS RECOMMENDED

1. Solomon, M.R. (2020). Consumer Behavior: Buying, Having, Being, Pearson Publication.
2. Sethna, Z. & Blythe, J. (2020). CONSUMER BEHAVIOUR, Sage Publications Pvt. Ltd.
3. Sethna, Z. & Blythe, J. (2019). Consumer Behaviour, Sage publication.
4. Mothersbaugh,D.L., Hawkins, D.I. & Mookerjee, A.(2019). Consumer Behavior: Building Marketing Strategies, Mc Graw Hill publication.
5. Kapoor, Nnamdi, R.O., Madichie (2017), Consumer Behaviour, Mc Graw Hill publication.
6. Solomon, (2015). Consumer Behaviour, Pearson India.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Consumer Behaviour, Wiley Online Library.
2. Journal of Business Research, Elsevier.
3. Journal of Consumer Research, Oxford Academic.
4. Journal of Consumer Psychology, ScienceDirect.com.

M-421-SERVICES MARKETING

OBJECTIVES

1. To provide an in-depth appreciation and understanding of the unique challenges inherent in managing and delivering quality services.
2. To understand how the interface between customers and the service is managed, identify and close the gaps for improving the services.
3. To acquaint the students with elements of services marketing mix, ways to manage the service delivery process and strategies to effectively implement Services marketing.

LEARNING OUTCOMES

1. Understand the key concepts and principles of services marketing, unique characteristics of service products, impact on design and execution of marketing strategies for services.
2. Foster critical thinking and problem-solving skills in services management.
3. Design service quality measurements to build customer loyalty and evaluate the effectiveness and efficiency of customer service offerings.
4. Manage service blueprinting, integrate new technologies, and address other key issues facing today's customer service providers and service managers.

Section –A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Services Marketing:** Understanding Services, Differences in Goods versus Services, Emerging Service Environment, Classification of Services, Service Encounters.	**2**
UNIT II	**Service Market Segmentation, Targeting & Positioning**: Process of market segmentation, Targeting and Positioning, service value addition to the service product, planning and branding service products, new service development, concept of flower of Service.	**3**
UNIT III	**Pricing Strategies for Services**: Service pricing, revenue Management, pricing objectives, Challenges in Pricing.	**4**

UNIT IV	**Service Promotion:** The role of marketing communication, Implication for communication strategies, setting communication objectives, marketing communication mix, role of Digital Marketing and social media marketing.	**3**
UNIT V	**Place & Process Decisions:** Methods of Service Delivery, Role of Intermediaries, Franchising, Service Process, Developing a Service Blueprint, Application of Service Blueprint.	**3**
UNIT VI	**People & Physical Evidence:** Frontline Service Employees, People Management Strategies, Service Leadership & Service Climate, Service Environment, Servicescape Model, Designing Servicescapes.	**3**
UNIT VII	**Service Excellence**: Enabling Service Excellence, Delivering Value, Service Failure & Recovery, Service Quality, SERVQUAL Model, Customer Loyalty.	**4**
UNIT VIII	**Customer Relationship Marketing:** Relationship Marketing, the nature of service consumption, understanding customer needs and expectations, Strategic responses to the intangibility of service performances.	**2**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Students are required to select one high-contact and one low-contact service. Using the Flower of Service framework, define the core product and then identify and categorise all the supplementary elements for each of the two services. Describe the results of your analysis. Finally, explain how the petals can be used for service differentiation and competitive advantage.
- Students shall devise a service script for a high-contact service. Possibilities include visiting a lawyer, getting a car repaired, eating a restaurant meal, renting a car, getting a haircut, visiting a fitness center or health club, attending a theatre performance etc. Students may need to take notes during their visit so that they can remember the process accurately. After you visit the service firm in a team, have to create a blueprint with maximum details.
- Suppose you are the marketing manager of a social club in Jaipur. What factors will you keep in mind to meet customer expectations? (Use SERVQUAL method)
- Students have to identify 2-4 points in the service, where the quality of the service needs to be improved or where problems in service quality are likely to occur. Then, using the Gaps-model as guide, try to find root causes for these shortcomings and identify the relevant.
- Select a service that you have to consume or experience (hairdresser, drinking coffee in a café, having a meal in a restaurant, etc.). Before consumption/experience, you need to discuss and prepare a brief paragraph about the type and level of service you expect to receive. You have to act as mystery

shopper and experience the service as if you were a real consumer. In some instances, the cost might be involved here, so choose the service you are evaluating wisely. You have to assess the service across the following criteria:

- Reliability
- Responsiveness
- Assurance
- Empathy
- Tangibles
- Overall service quality impression

Prepare a short presentation of the assessment with recommendation on how the service can be improved.

BOOKS RECOMMENDED

1. Chatterjee, J. Lovelock, C. & Jochen Wirtz, J. (2020). Services Marketing, 8/e Eighth Edition, Pearson Education.
2. Zeithaml, Bitner, M.J., Gremler, D.D., (2018). Services Marketing: Integrating Customer Focus Across the Firm, Seventh Edition, New York, NY: McGraw-Hill Companies.
3. Dutta, K. & Vinnie Jauhari, V. (2017). Services Marketing: Text and Cases Oxford University Press; Second edition.
4. Hoffman, K.D and Bateson, J.E.G. (2017). Services Marketing: Concepts, Strategies and Cases, Cengage India Private Limited; Fifth edition.
5. Verma, H. (2017). Service-Marketing: Text and Cases, 2/Ed, Pearson Education India; 2nd edition.
6. Chowdhary, N. & Chowdhary, M. (2005). Textbook of Marketing of Services: The Indian Experience, Macmillan India Ltd.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Service Marketing, SCI.
2. Service Business: An international Journal, Springer.
3. Journal of Service Marketing, Emerald Insight.
4. Service Marketing Quarterly, Taylor & Francis.

M-422-INTERNATIONAL MARKETING MANAGEMENT

OBJECTIVES

1. To acquire the basic knowledge, concepts, tools, and international terminology necessary to understand global problems and issues.
2. To understand how companies adjust their international strategies based on the global environmental changes.
3. To build skills and understanding of nations' cultures by critically analysing the social, political, legal, and economic forces that affect the business performance in international marketing.

LEARNING OUTCOMES

1. To analyse the environmental variables that influence international marketing.
2. To devise strategies and tactics that can lead to successful international marketing strategies given environmental constraints.
3. To analyse the issues and challenges related to market entry and expansion strategies into foreign markets.
4. To understand how managers perform the functional tasks that constitute international marketing such as marketing intelligence and "mix" adaptations.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**International Marketing:** Concept, Domestic Vs. International Marketing, E.P.R.G. Framework, International Trade Environment, Political Environment, legal and Regulatory Environment, Socio-cultural Environment, Economic Environment, Technological Environment.	**3**
UNIT II	**International Market Environment:** Identifying and analysing opportunities in the international trading environment, understanding the changes in the world trading environment-IMF, W.T.O., impact on international marketing.	**3**
UNIT III	**International Marketing Research:** Concept of Marketing Research, International Marketing Research Process, market surveys, marketing information system, International Product Life Cycle, Selecting Market Entry Modes.	**4**
UNIT IV	**International Product Policy and Planning:** International new Product Development, International Product Planning, Product Adoption and Standardisation, International Market Segmentation, Influences on Marketing Plan and Budget, International Product Marketing.	**2**

UNIT V	**Managing International Pricing:** Environmental influences on Pricing Decisions - Grey Market goods, Transfer pricing, Pricing Strategies.	**4**
UNIT VI	**International Promotional Strategies:** Introduction, Communications Process, communication principles, Promotion Appeals, Media Selection, Personal Selling, Public Relations and Publicity, Sales Promotion, advertising, e-marketing.	**3**
UNIT VII	**International Distribution and Logistics:** International Logistics Planning, Distribution – Definition and Importance, Direct and Indirect Channels, factors Involved in Distribution Systems, Modes of Transportation, International Packaging.	**3**
UNIT VIII	**Evaluating and Controlling:** Evaluating and controlling international marketing strategy, Legal and Ethical Issues in International Marketing, ethical Consideration in International Marketing.	**2**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- An India-based firm is engaged in importing rough stones from Africa and polishing and selling precious stones in the international market. The firm has recently started polishing Tanzanite-stones imported from Tanzania. As recently appointed head of the firm's International Market development Division, prepare a research plan detailing out the requirement for secondary information and possible sources of collecting information.
- Surf the internet and list various resources from where you could get information that can be used for conducting international market research. Critically comment on the limitations of each of the information sources from the internet. Discuss your findings.
- Suppose you are the marketing manager of a modern and technically equipped international Gym chain. What measures will you take before opening a store or chain of stores in a new city?
- Write a ten page essay on 'Challenges and opportunities in International Marketing'. Also mention Favourable government policies for promoting International Trade in India.
- Watch one interview of any International Business Personality of your choice; create a PowerPoint Presentation on same personality and include the following heads:
  - Life story
  - Achievements
  - Challenges Faced
  - Marketing Campaigns of the organisation

BOOKS RECOMMENDED

1. Paul, J. and Kapoor, R. (2012). International Marketing-Text and Cases, Tata McGraw Hill.
2. Joshi, R.M. (2014). International Marketing, Oxford University Press.
3. Green, M.C. & Keegan, W.J. (2020). Global Marketing, 10th Edition, Pearson.
4. Jain, K.S. (2014). Export-Import Procedures and Documentation, Himalaya Publishing House.
5. Philip, C.R. & John, G.L. (2019). International Marketing, McGraw Hill; 18th edition.
6. Mathur, U.C. (2008) INTERNATIONAL MARKETING MANAGEMENT Text and Cases, Sage Publications Pvt. Ltd.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of International Marketing Management, Sage Publoshng.
2. Journal of International Marketing Management, American Marketing Association.
3. Journal of International Marketing Management. JSTOR
4. Journal of Global Marketing, Taylor and Francis.

M-423-RURAL MARKETING

OBJECTIVES

1. To make students understand the rural market environment and 4 A's of rural marketing.
2. To provide an understanding of the changing profile of the rural consumer, their consumption pattern, and buying process.
3. To comprehend development of product, price, distribution and communication strategies for different segments of rural markets.

LEARNING OUTCOMES

1. Understand the rural marketing concepts and the contemporary issues in rural marketing.
2. Analyse the rural market based on segmentation, targeting and positioning.
3. Know the rural consumer behaviour and their decision-making process.
4. Develop strong foundation of applied knowledge, concepts and analytical skills for effective marketing of products and services to rural consumers.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Rural Marketing:** Definition, concept and scope of rural marketing, Features of rural markets, classification of rural markets, Rural Marketing Mix- 4 A's concept, Opportunities and Challenges, Difference between Urban and Rural Markets.	**3**
UNIT II	**Rural marketing environment:** Evolution of Rural Marketing, Rural Environment: Demographic environment, Social & Cultural environment, Technological environment, Physical environment, political environment, Rural economic environment and economic structure, Rural Development Programme and Schemes of Government.	**3**
UNIT III	**Rural Consumer behaviour:** Factors affecting Consumer Behaviour, Cultural factors, social factors, Personal Factors, Psychological factors, Consumer Buying Decision Process, Role of Opinion Leaders.	**3**
UNIT IV	**Researching, Segmenting and Targeting Rural Markets:** Rural Marketing Research Process, Tools used in Rural Marketing Research, Bases of Segmentation, Thomson Rural Market Index, Evaluation, Selection and coverage of Segments, Identifying, selecting, developing and communicating the positioning concept.	**4**
UNIT V	**Rural Product and Pricing Strategies:** Rural Product classification, Product decisions and strategies, Rural product designing and new product development, Brand building in Rural India, Packaging and after-sales service for rural markets, Fake Brands, Pricing in rural India, Price setting strategies.	**3**

UNIT VI	**Rural Distribution Strategies:** Rural Channel members, Channel behaviour, Conventional Distribution Models in Rural Markets, Rural retail environment, Rural specific Distribution Models, Rural Logistics: Hub & Spoke System, Syndicated Distribution.	**3**
UNIT VII	**Communication strategies for Rural Markets:** Challenges in Rural Communication, The Communication Process, Designing the message, Creating an advertisement for rural audiences, Rural media- Conventional and Non-Conventional Media, Role of Social Media in Rural Marketing.	**3**
UNIT VIII	**Rural Services Marketing and future of Rural Marketing:** Telecommunications and I.T. in Rural India, Financial Services, Rural healthcare services, Future of Rural Marketing in India.	**2**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Imagine that you are the product development manager in a fairness cream manufacturing company. How would you augment the product and create its brand identity in rural markets?
- Students should design new product launch strategies in FMCG and Consumer Durable category keeping the rural marketing mix 4 As (Awareness, Acceptability, Adaptability and Affordability) in mind.
- Undertake a rural survey on purchase patterns of automobiles, mobiles or any other consumer durable.
- Study H.U.L.'s "Project Shakti" model, Coca-Cola "Parivartan", and I.T.C.'s e-choupal initiative and make a presentation on the same.
- Visit a rural village and find out about rural communication strategies, including use of unconventional media for promoting products.
- An international processed food manufacturing company has come up with its new fortified products (biscuits and snacks), which it wants to promote in iron-deficient areas of India. Devise communication and distribution plan for the company.

BOOKS RECOMMENDED

1. Kashyap, P. (2016). Rural Marketing, Third Edition, Pearson Education India.
2. Puri, S.S.(2020). Rural Market Unleashed: Position Yourself in the Rural Market Effectively, First Edition, Notion Press.
3. Kumar, D., Gupta, P. (2019). Rural Marketing: Challenges and Opportunities, SAGE Publications.
4. Krishnamacharyulu. (2010). Rural Marketing: Text and Cases, Second Edition, Pearson Education India.
5. Kumar D. & Gupta P. (2017). Rural Marketing Challenges and Opportunities, Sage Publications Pvt. Ltd

6. Dogra, B., Ghuman, K.(2007) Rural Marketing: Concepts and Practices, First Edition, McGraw Hill Education .

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Rural Marketing, Rural Marketing Agencies Association of India (R.M.A.A.I.).
2. International Journal of Rural Management, SAGE Publications.
3. Journal of Rural Studies, Elsevier.
4. International Journal of Rural Management (I.J.R.M.), Institute of Rural Management Anand (I.R.M.A.).

M- 424-DIGITAL AND SOCIAL MEDIA MARKETING

OBJECTIVES

1. To develop a framework for understanding the forces driving the digital revolution in marketing and business.
2. To understand a digital marketing mix
3. To integrate different digital media and create effective marketing content.

LEARNING OUTCOMES

1. Able to identify the role of digital and social media marketing for success.
2. Manage customer relationships across all digital channels and build better customer relationships.
3. Develop insight on Current Trends of Digital and Social Statistics and gain understanding of marketing analytics.
4. Gain knowledge, skills and competencies to design digital marketing plans in order to manage a digital marketing programme efficiently

Section - A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Digital Marketing** Evolution of Digital Marketing from traditional to the modern era, Role of Internet; Current trends, Info-graphics, implications for business & society; Emergence of digital marketing as a tool; Digital marketing strategy; Paid, Owned, Earned Media (P.O.E.M.)framework, Digital marketing plan.	**3**
UNIT II	**Internet Marketing and Digital Marketing Mix** – Internet Marketing, opportunities and challenges; Digital marketing framework; Digital Marketing mix, Impact of digital channels on I.M.C.; Search Engine Advertising: - Pay for Search Advertisements, Ad Placement, Ad Ranks, Creating Ad Campaigns, Display marketing: - Types of Display Ads - Buying Models - Programmable Digital Marketing - Analytical Tools - YouTube marketing, online branding.	**3**
UNIT III	**Social Media Marketing:** Introduction to social media platforms, penetration & characteristics; Building a successful social media marketing strategy, Meaning, Purpose, types of social media websites. Blogging: Types of blogs, Blogging platforms & recommendations. Social Media Engagement, Sharing content on social media, advantages and disadvantages of social media.	**3**

UNIT IV	**Social Media Tools**: Facebook Marketing-Introduction, Anatomy of an Ad Campaign, Role of Adverts-Types & Targeting. **Linkedin Marketing**: Introduction and Importance of Linkedin Marketing, Framing Linkedin Strategy, Lead Generation through Linkedin, Content Strategy, Analytics and Targeting. **Twitter Marketing**: Introduction to Twitter Marketing, , framing content strategy, Twitter Advertising Campaigns. **Instagram and Snapchat**: Digital Marketing Strategies through Instagram and Snapchat. **Mobile Marketing**: Mobile Advertising, Forms of Mobile Marketing, Features, Mobile Campaign Development.	**3**
UNIT V	**Introduction to SEO:** Web Analytics, Mobile Marketing, Trends in Digital Advertising– - Introduction and need for SEO, application of internet & search engines; search engine and its working pattern, On-page and off-page optimisation, SEO Tactics - Introduction to Search Engine Marketing(S.E.M.). **Web Analytics**: Google Analytics & Google Adverts; data collection for web analytics, multi-channel attribution, Universal analytics, Tracking code.	**3**
UNIT VI	**E-Marketing Management:** Product – Products on Internet, Creating Customer Value Online– Product Benefits, E-Marketing Enhanced Product Development, Price – Change in Pricing Strategies, Payment Options, Pricing Strategies, Distribution– Online Channel Intermediaries – Distribution Channel Length and Functions, Channel Management and Power, Distribution Channel Metrics.	**3**
UNIT VII	**E-Marketing Research:** Data Drive Strategy, Marketing Knowledge Management, Monitoring Social Media, Technology-Enabled Approaches, Real-Space Approaches – Marketing Databases and Data Warehouses – Data Analysis and Distribution, Knowledge Management Metrics. **Data Analytics**: Introduction, Key terms and concepts. Working with data., setting objectives, goals and KPIs, tracking and collecting data. Analysing data.	**3**
UNIT VIII	**Customer Relationship Management**: Concept of CRM, goals of CRM, e-CRM, benefits of e-CRM, role of CRM technology, e-enterprise, next-generation CRM.	**3**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- The students need to create a hypothetical business and devise its launch campaign. Students should consider website design, blog strategy, search engine optimisation, landing page creation, call to action placement, social media interaction and email marketing.
- Divide students into two groups. One will advocate inbound marketing as an effective marketing strategy and the other traditional marketing strategies. For the debate, students should use specific business examples to demonstrate that their advocacy strategy effectively generates leads and customers.
- Collect a group of recently published blog posts from various blogs and industries and make a list of their titles. Students to discuss whether they think the article title would successfully attract visitors through search engines and social media. Students to carefully read full articles. Create new headlines for each blog post optimising for keywords, social media sharing, and comprehensive summary.
- Students to write a blog post to get as many page views as possible in 24 hours. After the 24 hours are up, students should prepare data to show their success or progress and why they were the most successful. Then, in a class discussion, students should examine the five top-performing posts and discuss how the headline, topic, content and promotion strategies may have driven that success.
- Students to create a Facebook Fan Page or a Group on Facebook for a hypothetical company. Compare how the capabilities of each Facebook tool differ and discuss which might be better depending on the campaign.
- Each student should select a business website of an industry of their choice. Next, students in each group will review their Website and identify elements that are missing or can be improved to increase the Website's marketing effectiveness. After compiling a list, students should run their Website on Website Grader and compare elements they identified with those they identified. Using the feedback from Website Grader, students should propose for the company to improve its on-page SEO, off-page SEO and overall website quality.

BOOKS RECOMMENDED

1. Hanlon, A. (2021).Digital Marketing : Strategic Planning and Integration, Sage Publications Pvt. Ltd.
2. Tracy L. Tuten, T. L., Solomon M.R. & Rishi B. (2020). Social Media Marketing, 3e, Sage Publications Pvt. Ltd.
3. Heinze, A., Fletcher,G., Rashid,T. & Cruz, A. (2020). Digital And Social Media Marketing A Results-Driven Approach, Taylor and Francis publication.
4. Kagan, J. & Singh, S.S. (2020). Digital Marketing: Strategy & Tactics, Wiley Pvt. Ltd.
5. Visser, M., Sikkenga, B & Mike (2018). Digital Marketing Fundamentals, Routledge Publications.

6. Gupta, S. (2017). Digital Marketing, Mc Graw Hill publication.

LIST OF JOURNALS/ PERIODICALS/ MAGAZINES/ NEWSPAPERS

1. Journal of Digital & Social Media Marketing, Henry Stewart Publications.
2. International Journal of Internet Marketing and Advertising, Inderscience publications.
3. Journal of Digital and Social Media Marketing by Scimago Journal and country rank.
4. Journal of Innovations in Digital Marketing, Luminious insights.

M-425-CUSTOMER RELATIONSHIP MANAGEMENT

OBJECTIVES

1. To emphasise on the importance of acquiring customers and retaining them for a lifetime.
2. To provide a conceptual understanding of CRM, its processes, and structure.
3. To enable participants to develop analytical approaches, methodologies, tools, and techniques for applying CRM.

LEARNING OUTCOMES

1. Understand the benefits delivered by CRM and comprehend strategies for its effective implementation.
2. To critically evaluate recent trends and issues in CRM.
3. Implement various technological tools for data mining and have conceptual understanding of e-CRM.
4. Design customer relationship management strategies by understanding customers' preferences for the long-term sustainability of the Organisations.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Customer Relationship Management Fundamentals**: Definition and Significance of Customer Relationship Marketing, Purpose of relationship marketing, Historical Perspectives, CRM cycle, CRM Strategy, Customer Life Time Value, Relationship Life Cycle.	4
UNIT II	**Building Customer Relationship Management:** Requisites for Effective Customer Acquisition, Customer Knowledge Management for Effective CRM, Customer Retention Process, Strategies to Prevent Defection and Recover Lapsed Customers.	3
UNIT III	**CRM Implementation:** CRM framework for Implementation, Implementing CRM Process, Integration of CRM with ERP System, Barriers to effective CRM .	2
UNIT IV	**Functional Components of CRM**: Database Management: Database Construction, Data Warehousing, architecture, Data Mining. Characteristics, Data Mining tools and techniques, Meaning, Significance, Advantages, Call Center, Multimedia Contact Center, Important CRM software's.	2
UNIT V	**Customer Relationship Management:** Technology Dimensions: - E-CRM in Business, CRM: A changing Perspective, Features of e-CRM, Advantages of e-CRM, Technologies of e-CRM, Voice Portals, Web Phones, Virtual Customer Representative, Customer Relationship Portals.	3

UNIT VI	**Sales Force Automation (S.F.A.):** Definition and need of Sales Force Automation, barriers to successful Sales Force Automation functionality, technological aspect of Sales Force Automation, data synchronisation, flexibility and performance, reporting tools.	4
UNIT VII	**Impact of CRM on Marketing Channels:** Meaning, how does the traditional distribution channel structure support customer relationship, emerging channel trends that impact CRM.	4
UNIT VIII	**Trends and Issues in CRM:** CRM in e-business (B2B & B2C), Measuring the Effectiveness of CRM, Factors Influencing the future of CRM.	2

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Identification of the type of customer information held by the chosen organisation and recommendations made for how 'information gaps' could be filled for acquisition and retention of customers
- Evaluation of how customer information held by the chosen organisation is applied in the selection and use of two promotional tools to build long¯-term relationships.
- Write a ten-page essay on "CRM failure" in the chosen Organization.
- Prepare a Comparative study report of different CRM software's and their applications.
- Visit one public and one private sector bank and study the effectiveness of CRM services provided by the Banks to its customers. Compile the observations in a powerpoint presentation.

BOOKS RECOMMENDED

1. Buttle, F. (2019). Customer Relationship Management, Routledge.
2. Fatouretchi, M. (2019). The Art of CRM: Proven strategies for modern customer relationship management, Packt Publishing.
3. Baran, R. J. & Robert J. Galka, R.J.(2016). Customer Relationship Management: The Foundation of Contemporary Marketing Strategy, Routledge publication.
4. Chorianopoulos, A. (2016). Effective CRM using Predictive Analytics, Wiley Pvt. Ltd.
5. Peppers, D.& Rogers, M. (2016). Managing Customer Experience and Relationships: A Strategic Framework, Wiley Pvt Ltd.
6. Peelen, E. & Beltman, R. (2013). Customer Relationship Management, Pearson Education.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Research in Marketing, Elsevier
2. International Journal of Customer Relationship Marketing and Management, Scimago Journals
3. International Journal of Electronic Customer Relationship Management, Inderscience Publisher
4. International Journal on Customer Relations, Publishing India Group

Human Resource Management (Group C)

S.No.	Subject Code	Subject Title
Semester IV - Electives		
1	M-430	Employee Relations & Labour Laws
2	M-431	Performance Management System
3	M-432	Cross Cultural Human Resource Management
4	M-433	Human Resource Analytics

M-430: EMPLOYEE RELATIONS & LABOUR LAWS

OBJECTIVES

1. To Provide conceptual framework of Industrial Relations.
2. To make students aware about the major provisions of Indian Labour legislations.
3. To make students aware with the basic requirements and mandate of labour legislations.

LEARNING OUTCOMES

1. Knowledge of Industrial Relations framework.
2. Competency to understand the importance of Employee Relations within the perspective of Industrial Relations.
3. Competency to interpret and implement the Labour Laws within organization.
4. Competency to use Collective Bargaining and Grievance redressal Mechanism.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction and Importance of Employee Relations Management:** Employee Relations Management Tool, Aspects of Industrial Relations, Emerging challenges of IR in India, Linking Industrial Relations with economic growth of a country.	**3**
UNIT II	**Trade Unionism:** Development of Trade Unionism, Functions, Type and Structure, Problems & Suggestive Remedial Measures of Trade Unions, Major Provisions of the Trade unions act, 1926.	**3**
UNIT III	**Collective Bargaining:** Significance, Types & Procedure of Collective Bargaining, Employee Participation and Empowerment- Objectives, Advantages of Employee Participation, Employee Participation in India, Methods of Participation.	**3**
UNIT IV	**Discipline:** Misconduct, Disciplinary Action, Types of Punishments, Code of Discipline, Domestic Enquiry. **Grievance:** Concept, Types, Grievance Settlement Procedure.	**4**
UNIT V	**Industrial Disputes Preventive & Settlement Machinery in India:** The Industrial Disputes Act, 1947 Settlement and Prevention of Disputes.	**3**
UNIT VI	**Law of Wages:** Code on Wages, 2019, Wages Code Concerns, Impact of the Code and Way Forward.	**2**

UNIT VII	**The Factories Act 1948:** Major Provisions of the Factories Act, 1948, The Inspecting Staff, Health, Safety, Welfare, Working Hours of Adults, Employment of Young Persons, Annual Leave With Wages, Special Provisions, Penalties And Procedure.	**3**
UNIT VIII	**The Industrial Employment (Standing Orders) Act 1946:** Major provision of The Industrial Employment (Standing Orders) Act 1946.	**3**

Section B

At Least one Case Study from each UNIT. Questions will be case/ inferences/ application based.

PRACTICAL COMPONENT

- Students should present the interpretation of Laws through Case study on Industrial disputes.
- Stimulate their thinking on rationale behind the laws and their enforcement problems through Case Analysis.
- Develop an understanding of the interaction pattern among labour, management and the State through structured case and role plays.
- Awareness of certain important and critical issues in Industrial Relations and tackling them through case studies and role plays.
- Role plays/ case studies on the existing industrial disputes.

BOOKS RECOMMENDED

1. Sahoo, D. P. (2020). Employee Relations Management: Text and Cases. Sage/Texts.
2. Industrial Relations, Trade Unions and Labour Legislation. (2017). India: Pearson India.
3. Srivastava, S. C. (2012). Industrial Relations and Labour Laws, 6th Edition. India: Vikas.
4. Sharma, R. C. (2016). Industrial Relations and Labour Legislation. India: PHI Learning.
5. Taxmann (2009) Labour Laws", Taxmann Allied Services Pvt. Ltd.
6. Kumar, H. L. (2010). Compliances Under Labour Laws. India: Universal Law Publishing.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Industrial Relations Journal, John Wiley & Sons
2. European Journal of Industrial Relations, Sage Publications
3. Industrial and Labor Relations Review, Sage Publications
4. Management and Labour Studies, Sage Publications

M-431: PERFORMANCE MANAGEMENT SYSTEMS

OBJECTIVES

1. To make students understand the basic concepts of Performance Management.
2. To expose students to different approaches of Performance Appraisal with their industry application.
3. To explore different types of performance management and evaluation criteria, techniques and programmes.

LEARNING OUTCOMES

1. Understand and apply performance management processes.
2. Learn to manage underperformance using a defined performance improvement process.
3. Ability to provide effective and regular feedback on performance.
4. Develop ability to set clear expectations that improve performance and productivity.

Section A

UNIT	Course Description	SESSIONS
UNIT I	**Introduction of Performance Management System:** Definition of Performance Management System, Performance Planning, Performance Coaching and Performance Appraisal, Role of Appraisals in Performance Management, Role of Performance Management System, Characteristics of an ideal PM system.	**4**
UNIT II	**Reviewing & Managing Performance:** Performance Appraisal: Definition and objectives of Performance Appraisal, Process of Performance Appraisal- Self Assessment and its importance, Methods of Performance Appraisal- Traditional and Modern; Performance Management Process.	**3**
UNIT III	**Performance Management and Strategic Planning:** Definition and Purpose of Strategic Planning, Process of Linking Performance Management to the Strategic Plan.	**2**
UNIT IV	**Performance Coaching:** Performance Appraisal as a training need assessment, Counseling for better performance, Feedback Mechanisms in Organizations- training the superiors to give constructive feedback.	**3**
UNIT V	**Potential Appraisal:** Meaning & objectives of Potential Appraisal, Potential Appraisal & Performance Appraisal.	**2**
UNIT VI	**Models for Assessing Performance:** Balance score card- Different Perspectives and Benefits, HR Scorecard- The HR Scorecard Approach, Process of Developing the HR Scorecard, Benefits of the HR Scorecard, Building a High Performance Culture.	**3**
UNIT VII	**Employee Development and Retention Strategies:** Personal Development Plans, Performance Management & Reward Systems- Performance linked remuneration system, Performance linked career planning & career development. Employee Retention- Meaning, Factors Responsible for High	**4**

	Employee Turnover, Employee Retention Strategies.	
UNIT VIII	**Ethics in Performance Management:** Ethical Perspective in Performance Appraisal System, Objectives of Performance Management Ethics, Code of Ethics and Code of Conduct, Implementing Code of Ethics in the Workplace, Ethical Dilemma in Performance Management.	**3**

Section B

At least one Case study from each UNIT. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Conduct a study on how talents are acquired and retained – in various industries – and various strategies followed by the respective companies.
- Students are excepted to collect the information related to attrition rates in various sectors and identify the possible reasons for the same through a survey.
- Conduct role plays on Performance Coaching.
- Conduct role plays and presentations on giving constructive feedback.
- Student should prepare a performance appraisal form.

BOOKS RECOMMENDED

1. Armstrong Michael, (2020). Performance Management: Key Strategies and Practical Guidelines, Kogan Page.
2. Rao, T. V. (2016). Performance management: toward organizational excellence. SAGE Publications India.
3. Armstrong Michael, (2014). Handbook of Performance Management, Kogan Page, fifth edition.
4. Dessler Gary, (2011). Human Resource Management, New Delhi, Pearson Education Asia.
5. Aguinis Herman, (2009). Performance Management, Pearson Education.
6. Durai, Pravin, (2010). Human Resource Management, Pearson, New Delhi.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Harvard Business Review, Harvard Business Publishing
2. Journal of Human Resource Development, Sage Publications
3. Journal of Applied Behavioural Science, Sage Publications
4. Human Resource Development Review, Sage Publications
5. International Journal of Human Capital and Information Technology, IGI Publishing

M-432: CROSS CULTURAL HUMAN RESOURCE MANAGEMENT

OBJECTIVES

1. To familiarize students with the latest global trends in HRM, HR Systems & policies.
2. To develop understanding for global managerial staffing & International decision-making.
3. To understand the challenges and development in international human resources management, the stages of internationalization of companies and methods of entry into international business.

LEARNING OUTCOMES

1. Understand the institutional context of international business; different employment standards and laws that relate to international human resource management; obstacles to multinational bargaining; approaches to multinational enterprises and labour relations.
2. Role of IHRM to develop leaders in a multinational organization; how companies plan development activities for their leaders based on their strategic objectives and company culture.
3. Learn how companies manage their expatriates; who is an expatriate and why companies use expatriates; what are the challenges in international assignments and how to manage the whole expatriation process.
4. Training and development of global employees.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to IHRM:** Definition, Difference between IHRM and Domestic HRM, Models of IHRM-Matching model, Models of SHRM in Multinational Companies, Internationalization of HRM. The Challenges of International Human Resource Management.	**3**
UNIT II	**Cultural Factors:** Dimensions of culture, the impact of culture on business practices, leadership across cultures, challenging role of Global Manager/Leader, need for cross-cultural management.	**3**
UNIT III	**Issues in Cross-Cultural HR Management:** The challenge of managing multicultural/ cross-cultural workgroups and international teams, virtual and multicultural teams, cross-cultural communications and negotiation- Decision-making within diverse cultures - ethical dilemmas and social responsibility facing firms in different cultures, Building cultural intelligence and cultural competence.	**4**

UNIT IV	**Recruitment, Selection and Staffing in International context:** International Managers, Parent Country Nationals, Third Country Nationals, Host Country Nationals, Selection Criteria and Techniques, use of selection tests, interviews for international selection, different approaches to multinational staffing decisions, recruitment methods using head-hunters, cross-national advertising, e-recruitment.	**4**
UNIT V	**Training and Development in International Context:** Backdrop of international training, role of expatriate training, HCN training, Career Development, repatriate training, components of effective pre-departure training programmes, developing international staff and multinational teams, knowledge transfer in multinational companies.	**3**
UNIT VI	**International Compensation:** Forms of compensation and factors that influence compensation policy, key components of international compensation, Approaches to international compensation, compensation practices across the countries, emerging issues.	**3**
UNIT VII	**International Labor Relations:** Key issues of International Labor relations, response of labor unions to MNCs.	**2**
UNIT VIII	**HRM Practices in Different Countries:** Japan, USA, UK, India and China.	**2**

Section B

At Least one Case Study from each UNIT. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Students are expected to discuss the challenges faced by Indian multinational companies in deploying employees from one country to another.
- Design and present a recruitment strategy for any two MNCs.
- Conduct a debate on the challenges involved in measuring performance of employees in multinational context.
- Identify whether too much dependence on home market leads to neglect of international opportunities.
- Identify whether role of international HR expanding from staffing to higher order planning.

BOOKS RECOMMENDED

1. Aswathappa, K., & Dash, S. (2020). International Human Resource Management|. McGraw-Hill Education.
2. Edwards, T. (2017). International Human Resource Management. Pearson Education Limited.
3. Dowling, P. (2004). International Human Resource Management: Managing People in a Multinational Context: Thomson, Cengage Learning.
4. Tayeb, M. (2005). International Human Resource Management: A Multinational Company Perspective. Oxford University Press.
5. Rao, P. L. (2008). International Human Resource Management: Text and cases. Excel Books India.
6. Srinivas, R. Kandula (2018). International Human Resource Management. Sage.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Cross Cultural Management, Sage Publications
2. Management Review- IIM Banglore, Elsevier Ltd
3. Technium Social Sciences Journal, Technium Science
4. ELK's International Journal of Human Resource Management & OB, ELK Asia Pacific Journals

M-433: HUMAN RESOURCE ANALYTICS

Objectives

1. To introduce students to the theory, concepts, and business application of human resource research, data, metrics, systems, analysis and reporting.
2. To develop an understanding of the role and importance of HR analytics, and the ability to track, store, retrieve, analyze and interpret HR data to support decision making.
3. To enable students to use applicable benchmarks/ metrics to conduct research and statistical analysis related to Human Resource Management

Learning Outcomes

1. Student will learn to apply quantitative and qualitative analysis to understand trends and indicators in human resource data; understand and apply various statistical analysis methods.
2. Learn to employ appropriate software to record, maintain, retrieve and analyze human resource information (e.g., staffing, skills, performance ratings and compensation information).
3. Develop understanding to connect HR results to business results.
4. Ability to identify HR benchmarks and metrics relevant to agency mission and goals.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to HR Analytics:** Concept and Definitions of Analytics, Importance and Significance of Human Resource Analytics, Benefits of HR Analytics, Evolution of HR Analytics, Application of HR and Predictive Analytics, LAMP framework of HR Analytics.	**4**
UNIT II	**HR Business Process and HR Analytics:** HR Research Tools and Techniques, Data Analysis for Human Resources, Parametric and Non-parametric Tests.	**2**
UNIT III	**HR Information Systems and Data Sources:** Introduction to HRIS, HRIS for HR Decision-making, HR Data and Data Quality, HR Data Collection, Transforming HR Data into HR Information, Process of Data collection for HR Analytics, HR Reporting, Data Visualization, Performing Root Cause Analysis.	**4**
UNIT IV	**Predictive Analytics:** Introduction, Different Phases of HR Analytics or HR Predictive Modelling, Data and Information for HR Predictive Analysis, Software Solutions, Predictive Analytics Tools and Techniques.	**3**
UNIT V	**HR Metrics :** Recruitment Metrics, Metrics for Training and Development Function, HR Analytics as a Better Tool for HR Decisions, Compelling Reasons for HR Analytics, HR Dashboards.	**4**

UNIT VI	**HR Scorecard:** Linking HR Data to Operational Performance, Creating HR Scorecard, Developing HR Measurement System, Guidelines for Implementing HR Scorecard.	**2**
UNIT VII	**Value Proposition and HR Decisions:** Introduction to Value Proposition and HR Decisions, Sustainability in HR Decisions, HR Analytics and HR Value Propositions, HR Optimization through HR Analytics; HR Forecasting, HR Plan and HR Analytics.	**3**
UNIT VIII	**HR Analytics for Future:** Understanding Future Human Resources, Generic Future HR Skill Sets and Knowledge, Ethical Issues in HR Analytics, HR Analytics and Empowerment of HR Function.	2

Section B

At Least one Case Study from each UNIT. Questions will be case/ inferences/ application based.

PRACTICAL COMPONENT

- Identify any hypothetical HR research issue and collect data for the proposed research to analyze and draw inferences to help in HR decision-making in the hypothetical organization.
- Identify the important HR metrics used in manufacturing companies.
- Design HR Dashboard on Performance Management issues for the sales force of any organization of your choice.
- Study and prepare HR report on any three Performance Metrics of HR function of any Organization.
- Prepare a presentation on how human resources can be empowered with HR Analytics with reference to any organization.

BOOKS RECOMMENDED

1. HR Analytics: Understanding Theories and Applications: Deepak Kumar Bhattacharya, Sage 2017.
2. Moore, McCabe, Duckworth, and Alwan. The Practice of Business Statistics: Using Data for Decisions, Second Edition, New York: W.H.Freeman, 2008.
3. Predictive analytics for Human Resources, Jac Fitz- enz, John R. Mattox, II, Wiley, 2014.
4. Human Capital Analytics: Gene Pease Boyce Byerly, Jac Fitz-enz, Wiley,2013.
5. The New HR Analytics: Predicting the Economic Value of Your Company's Human By Jac FITZ-ENZ, 2010.
6. The HR Scorecard: Linking People, Strategy, and Performance, by Brian E. Becker, Mark A. Huselid, Mark A Huselid, David Ulrich, 2001.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Organizational Dynamics Journal, Elsevier Ltd.
2. The International Journal of Human Resource Management, Taylor & Francis (Routledge)
3. Journal of Organizational Effectiveness, Nature Publishing Group
4. Human Resource Management International Digest, Emerald Group Publishing Ltd

Operations & Supply Chain Management (Group D)

S. No.	Subject Code	Subject Title
IV Semester		
1	M-440	Supply Chain and Logistics Management
2	M-441	Project Management
3	M-442	Service Operations Management
5	M-443	Technology Management

M-440 SUPPLY CHAIN & LOGISTICS MANAGEMENT

OBJECTIVES

1. To learn about the role of supply chain management in value, customers and pricing. Also to understand how to integrate a manufacturing unit with customer.
2. Logistics as movement of smooth flow of material movement with optimizing the warehousing, transportation and network of materials transfer.
3. To describe the increasing significance of logistics and its impact on both costs and service in business and commerce.

LEARNING OUTCOMES

1. Develop an understanding of the importance of logistics in the formulation of the business strategy and the conduct of supply chain operations.
2. Develop an in-depth understanding of logistics operating areas and their interrelationship.
3. Define and establish the strategic importance of logistics to achieve business success by creating value through supply chains.
4. Analyzing, comparing and interpreting the combination of customer accommodation, market distribution, procurement, and manufacturing represents the supply chain areas that are linked and supported by logistics and lean management.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Nature of supply chains, Historical perspective, objectives, importance, decision phases and process views of supply chain. **Supply chain performance:** competitive and supply chain strategies, achieving strategic fit and its challenges. **Supply chain drivers and metrics:** Impellers of supply chain, financial measures of performance, derivers of supply chain performance, framework for structuring drivers.	**3**
UNIT II	**Logistics Management:** Scope and definition, historical perspective, Value added nature of logistics, logistics and supply chain management, customer service and logistics, key issues and challenges for logistics. **Designing the supply chain network: Designing distribution networks:** Role of distribution in supply chain, factors influencing distribution network design, design options for a distribution network, online sales and distribution network. **Network design in supply chain:** role of network design, factors influencing network design decisions, framework for network design decisions. Impact of globalization on supply chain networks.	**4**

UNIT III	Demand forecasting in a supply chain, Aggregate planning in a supply chain, Sales and operations planning in supply chain, Coordination in a supply chain: Bullwhip effect, effect on performance, obstacles to coordination in a supply chain, continuous replenishment and vendor managed inventories, collaborative planning forecasting and replenishment.	**3**
UNIT IV	**Planning and Managing inventories in a supply chain:** Managing economies of scale in supply chain, managing uncertainty in supply chain, determination of optimal level of product availability	**3**
UNIT V	**Designing and planning transportation network:** Role of transportation in a supply chain, modes of transportation and their performance, transportation infrastructure and policies, design options for a transportation network, tradeoffs, tailored transportation.	**3**
UNIT VI	**Sourcing decisions in a supply chain:** Role of sourcing, In-house or Outsource, third party suppliers, total cost of ownership, sharing risk and rewards in supply chain. **Pricing and revenue management in supply chain:** Role of pricing and revenue management in a supply chain, pricing and revenue management for multiple customers segments, perishable products, seasonal demand, bulk and spot contract.	**3**
UNIT VII	**Sustainability and supply chain:** Role of sustainability, key pillars of sustainability, sustainability, and supply chain drivers, closed loop supply chains. The role of Information Technology in a supply chain	**3**
UNIT VIII	**Decision-support systems for supply chain management:** The challenges of modeling, structure of decision support systems, input data analytical tools, presentation tools, supply chain decision support systems.	**2**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Prepare a chart for Supply chain network of petroleum , milk product, etc
- Study and design a supply chain network for film distribution system to distributors and release of film
- Study and analysis of logistics integration system of Walmart company
- Study and prepare a report for decision support system and with retail
- Analysis for DSS of reliance fresh or any other retail company for FMCG product
- Study and comparison for pull v/s push system for coke , pepsi products or any other company
- Study of FMCG inventory management at any retail warehouse/ retail mall.

BOOKS RECOMMENDED

1. Mohanty, Supply chain Management, Pub Wiley, 2016
2. Roberta S Russell and Bernard W Taylor, Operations and supply chain management Pub Wiley, 8th Edition, 2017.
3. Donald J Bowersoy& David J Closs , Logistical Management- - Tata Mc GrawHill, 2015
4. R P Mohanty& S G Deshmukh, Supply Chain Management- Theories & Practice –- Pub: Biztantra House, 2017
5. Donald Waters, Logistics: An introduction to SCM, pub. Palgrave,McMillan, 1st edition, 2003.
6. Sunil Chopra, Supply Chain Management-–Pub: Peter Meindi, 2009
7. Badi N V, Supply chain Management- - Pub : Vrindra Publications (P) Ltd.,Delhi, 2011
8. Sunil Sharma, Supply Chain Management- Concept, Practice &Implementation - Pub: Oxford Univ. Press, 2016
9. V.VSople- Logistics Management-Pub.- Pearson edition-2013

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. American Journal of Supply Chain Management,
2. Asian journal of Naval Research Logistics,
3. International Journal of Logistics Management,
4. International Journal of Physical Distribution and Logistics Management

M-441 PROJECT MANAGEMENT

OBJECTIVES

1. Discuss essential concepts project management.
2. Understand the project feasibility analysis and the key steps involved therein.
3. To understand fundamentals of project costing and Budgeting.
4. Discuss the nature and use of network techniques for project management.
5. Understand the importance of scheduling / allocating resources to a project & concept of time and resource constraints
6. Understand the process for crashing a project, and concept of optimum duration/cost projects

LEARNING OUTCOMES:

1. Apply project management tools and methodologies.
2. Develop network for the project
3. Compute critical path and float/slack
4. Successfully plan and implement projects
5. Perform project crashing and optimum resource allocation.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Philosophy and Concepts:** Project Characteristics, typology of projects, need for PM, Projects goals, key features: The project manager, the project team, and project management system. Different forms of project management, Project environments	**3**
UNIT II	**Systems approach to project management:** Project life cycle, Systems development cycle and project management, **Conception phase:** Project initiation, Project feasibility, Request for proposal, feasibility study, project proposal, selection of proposal, project contracting. Definition phase, Execution phase, Execution phase: Production and implementation stage. Operation phase	**3**
UNIT III	**Project Planning Tools:** Work Breakdown structure and work packages, Responsibility matrix, Events and milestones, Gantt charts	**2**
UNIT IV	**Project scheduling:** Project representation as network: AON and AOA, role of dummies, topological ordering of jobs, Fulkerson's rule for node numbering, Adjacency matrix. Time estimates: Optimistic, pessimistic, and most likely time, Single and multiple time estimates. **Program Evaluation and review Technique (PERT):** The Beta distribution, Expected time or average time, variance of activity, Computation of Earliest expected time and latest allowable occurrence time, Forward pass and backward pass, Slack time, and Critical path. Probability of achieving project completion date. Central limit theorem and application to a network.	**4**

UNIT V	**Critical Path Method (CPM):** Network construction, determination of critical path, floats and their significance, Crashing the network and optimum duration of project completion using time scaled network. Resource allocation: Resource smoothing and resource levelling.	**4**
UNIT VI	**Cost Estimating and Budgeting:** Cost estimating, cost escalation, cost estimating and systems development cycle, cost estimating process, elements of budgets and estimates. Project cost accounting and management information systems, cost schedules and forecasts. **Managing Risks in Projects:** Risk concepts, risk identification, sources of risk, identification of project risk, risk assessment, risk impact: consequence and priority, Risk response planning.	**4**
UNIT VII	**Project Control:** Internal and external project control, cost accounting systems for project control, project control process, project control emphasis. **Performance analysis:** Cost and schedule analysis with budged cost of work performed, work package analysis and performance indices. Estimation of cost remaining to complete the project. Variance limits.	**3**
UNIT VIII	**Project Management Information Systems:** Functions of PMIS, Computer based PMIS systems: MS Project, Project Scheduler, Primavera etc., Web based project management. **Project Evaluation, Reporting and Termination:** Formative and summary evaluation, review meetings. Project reporting for top management, project managers and customers. Reasons for project termination, causes of project failure and success. Introduction to project force field analysis	**3**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

Case study related to project formulation & execution of chemical / petrochemical / automobile / building construction and / or event management

- Example /case for project responsibility matrix
- Example / case for project appraisal
- Example / case for scope management
- Example / case for project Networking
- Example / case for project quality management
- Example / case for project risk management
- Example /case for project performance and closure
- Assigning specific situations to the students for developing a project plan and

presenting the same in the class.

- Feasibility analysis of a live project to be undertaken by the students.
    - Students to visit any two financial institutions and study the project appraisal criteria adopted by them.

BOOKS RECOMMENDED

1. Projects: Planning, Analysis, Selection, Financing, Implementation, and Review, Prasanna Chandra, Projects, McGraw Hill Education; Eighth edition (1 July 2017)
2. Engineering Project Appraisal, Martin Rogers and Aidan Duffy, Wiley-Blackwell; 2 edition, 2012
3. Kerzner, H., Project Management – Systems Approach to Planning, Scheduling and Controlling, 2001.
4. Meredith and Mantel, Project Management, 2001.
5. PMI, A Guide to Project Management Body of Knowledge, 2000.
6. Wiest, J.D. and Levy, F.K., A Management Guide to PERT / CPM, 2001.
7. John M. Nicholas, Project Management for Business, Engineering and Technology, Elsevier publications, 2008.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. American Journal of Supply Chain Management,
2. Asian journal of Naval Research Logistics,
3. International Journal of Logistics Management,
4. International Journal of Physical Distribution and Logistics Management

Project Management Journals and Articles published in India and internationally such as International Journal of Project Management Association, Project Management Journal, Journal of Organizational Change Management, Project Manager Today Periodical, Journal of Productivity Analysis and use of Software like M.S. Project, SAP, etc. is encouraged.

M-442 OPERATION MANAGEMENT IN SERVICE

OBJECTIVES

1. Learn for Operation management in service industry
2. Able to make analysis for customer requirement and product feature
3. Learn and able to frame for layout of designing delivery system

LEARNING OUTCOMES

1. Knowledge and understanding of key concepts, tools and techniques pertaining to the management of transaction-based service processes.
2. An appreciation of the role of strategic operations planning and skill in constructing and optimising a strategic operations plan for Service Industry.
3. Develop an understanding of the terminology and responsibilities that relate to Service Operations Management.
4. Interpret basic tools and skills used in solving problems traditionally associated with operating the service operations system.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Role of Services in an Economy:** Service definitions, dependency of manufacturing on services, Economic evolution, , nature of service sector. The nature of services: service classification, the service package, characteristics of service operations, classifying services for strategic insights, systems view of services. Service strategy: Strategic service vision, competitive service strategies, winning customers in marketplace, stages in service firm competitiveness, measuring service productivity**.**	**3**
UNIT II	**Designing the Service Enterprise: New service development:** service design elements, service blueprinting, strategic positioning through process structure, taxonomy for service process design, generic approaches to service system design, customer value equation. **Technology in services:** Role of technology in the service encounter, emergence of self service, automation in services, internet services, electronic and traditional services, service product and process dimensions. Technological innovation in services.	**3**
UNIT III	**Service Quality:** dimensions of service quality, measuring service quality, quality service by design, walk through audit, achieving service quality, service recovery, stages in quality development. **The service encounter:** The service encounter triad, service organization, contact personnel, the customer, creating customer service orientation, service profit chain	**3**

UNIT IV	**Service Facility Planning:** Servicescapes, facility design, process analysis, facility layout. Service facility location: classification of service facility location issues, facility location technique-single and multiple facilities, site considerations	**3**
UNIT V	**Managing Service Operations:** Forecasting demand for services: Subjective models: Delphi method, cross impact analysis, historical analogy. Causal Models and time series models. Managing capacity and demand: strategies for managing demand, strategies for managing capacity, yield management	**3**
UNIT VI	**Managing waiting lines:** Queuing systems, essential features of queuing system, capacity planning and queuing models: analytical queuing models, capacity planning criteria.	**3**
UNIT VII	**Service Supply Relationships:** Supply chain management, service supply relationships, managerial implications of bidirectional relationships, sources of value in service supply relationships, outsourcing services and its managerial considerations.	**3**
UNIT VIII	**Growth and Globalization of Services-** Domestic growth and expansion strategies: Focused service, focused network, clustered service, diversified network. Franchising: nature, benefits to franchisee and issues. Globalization of services: Generic international strategies, nature of borderless world, planning transnational operations. Global service strategies.	**3**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Being a manager in five star Hotel industry ,prepare norms and quality systems for best service practice to delight customers
- Being a manager marketing in motor vehicle insurance company, how you would develop a economic justification for equipment insurance of fertilizer company for four compressors which are costing of worth Rs. 3000 Million.
- Being in a Hotel Industry, Design total logistics for supply of food plates to airway service industry 2000 numbers per day basis, distance travelled is 20 km.
- Being a manager inventory in a retail sector mall how you would analyses the FMCG items stocking philosophy so that stock out condition and expiration does not exists
- You are Head of Marketing for a new fertilizer plant under project stage, How you would establish the SCM up to retailers,so that one day company producing 2000 MT per day basis you would be able to claim management that complete per day production is distributed to retailers and also sold to the customers one day lead basis.
- Design your plan and branding, as well as seeding program for your own brand product which is expected after a year so that you can ensure management commitments at full confidence.

BOOKS RECOMMENDED

1. Service Management: Operations Strategy, Information Technology, James A Fitzsimons, Mona J. Fitzsimons, Tata McGraw Hill
2. K Shridhara Bhat, Service Operations Management, Pub. Himalaya,2015.
3. Christopher Lovelock, Services Marketing, Pearson Education. 2017
4. Ashwathappa K, & Sridhar Bhat K , Production and Operations Management Himalaya Publications, 2015
5. Russel and Taylor , Operations Management: Along the supply chain -, 6/e, Wiley India. 2014
6. UpendraKachru, 1/e Production and Operations Management: Text and cases Excell Books. 2016

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Service Industry Management
2. Journal of Financial Services Research
3. American Journal of Retailing and Consumer Services
4. Manufacturing and Service Operations Management

M-443 TECHNOLOGY MANAGEMENT

OBJECTIVES

1. Understand basic concept and meaning of technology
2. Discuss evolution and growth of technology
3. Understand role and significance of technology management

LEARNING OUTCOMES

1. A working understanding of the concepts and techniques of strategy technology management.
2. An ability to critically analyse the behaviour of organizations and organisational members in developing, implementing, and managing technology from a strategic perspective
3. Expertise on Innovation and Productivity Improvement Techniques to enhance organisation performance.
4. To develop the perspective for continuous improvement through change.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction :** Understanding Technology and its Relationship with Wealth of Nations and Firms Specific Knowledge; Technology Life Cycles, Technology Acquisition and Absorption; Technology Exports / Joint venture Abroad.	**2**
UNIT II	**Change Management:** Understanding the Nature, Importance, Forces, Types of Change; Diagnosing Organizational Capability to Change strategy, Structure, Systems and People; Building Culture and Climate for Change: Role of Leadership; Managing Transformations.	**3**
UNIT III	**Productivity Improvement Techniques:** Definition & Concept of Productivity : Partial productivity, Total Productivity model Salient features of TPM, Causes of poor productivity, Sumanth's five pronged approach to productivity improvement, Limitations	**3**
UNIT IV	**Innovations Management:** Invention vs. Innovation; Innovation Strategies and Models; Concurrent Engineering; Process Innovation, Product Innovation, Innovation Management	**3**
UNIT V	**Creative and Lateral Thinking Management:** Thinking, Creative Thinking, Problem Solving, Managing Lateral Thinking.	**3**
UNIT VI	**Make or Buy Decisions:** Concept of outsourcing, Factors influencing Make Or Buy Decisions, Trends in Make Or Buy Decisions in context of core competency.	**3**
UNIT VII	**World Class Manufacturing Techniques:** Historical perspective Bench marks, Bottlenecks and Best Practices: Concepts of benchmarking, bottleneck and best practices, Best performers - Gaining competitive edge through world class manufacturing, Value added manufacturing,	**4**

	eliminating waste, Toyota Production System, example. System & tools for world class manufacturing: Improving Product & Process	
UNIT VIII	**Business Process Reengineering:** Concept of BPR, process of BPR, prerequisites for effective BPR implementation, application of BPR in productivity improvement.	**3**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Study and analysis of Technology upgradation for crude oil extraction Techniques/ fuel engine Study and prepare a report for BPR for Motor cycle vehicles for fuel efficiency design and parameters.
- Study and analysis of any two products of ITC or HUL for its recognition as world class leaders for lean manufacturer & 5S practice.
- Study and report preparation for how to increase the productivity of any FMCG manufacturing company.
- Concept study for any organization ,which has practice of change management and its benefits
- Study and analysis of Innovation management of Dr.fix –it products for house and roof interior finishing Or Innovation in tyre industry as radial tyre and its benefits.
- Study and analysis of make or buy decision for washing mc electronic parts for long run success of company.

BOOKS RECOMMENDED

1. Business driven Technology- Hagg& Philip- McGraw Hill, 2012
2. Murthy C S V , Technology Management –pub. Himalaya Publishing house, 2009
3. HosseinBidgoli (2010), The Handbook of Technology Management (3 Volume Set), Wiley.
4. Tushman, Michael L and Philip Anderson (2004). Managing Strategic Innovation and Change, 2nd Edition, Oxford University Press.
5. Adair, John (2007). Leadership for Innovation, Kogan Page India Private Limited.
6. Narayanan, V K. (2001). Managing Technology and Innovation for Competitive Advantage. Pearson Education.
7. Frederick Betz (2003), Managing Technological Innovation, Competitive Advantage from change, Second Edition, John Wiley & Sons, Inc., USA.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Technology Information Forecasting & Assessment Council" (TIFAC),
2. International Journal of Technology Management,
3. Journal of Manufacturing Technology Management,
4. Journal of Research Technology Management.

Information Technology Management (Group E)

S. No.	Subject Code	Subject Title
IV Semester		
1	M- 450	Software Project Management
2	M-451	Managing Digital Innovation and Transformation
3	M-452	Artificial Intelligence for Managers
4	M-453	Emerging Technologies In Database Management

M-450 SOFTWARE PROJECT MANAGEMENT

OBJECTIVES

1. Understand the fundamental principles of Software Project management
2. Resolve the process of managing software from conventional to modern.
3. Familiarity with different methods and techniques used for project management.

LEARNING OUTCOMES

1. Develop the model from the conventional software product to the modern.
2. Analyze and design software architecture.
3. Apply, analyze, design and develop a software project.
4. Design various estimation levels of cost and effort.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Software Development Organization and Roles**: The Management Spectrum; Organizational Structure; Types of Organizational Structures –Hierarchical Organizational Structure, Flat Organizational Structure, Matrix Organizational Structure, Networked Organizational Structure, T Form Organization; Job Roles in Software Development.	3
UNIT II	**Overview of Project Management:** Project Management – Definitions; Factors Influencing Project Management – Project Manager, Project Management Activities, Stakeholders; Project Communication; Project Development Phases; Project Charter; Statement of Work (SoW); Project Management Associations.	3
UNIT III	**Project Planning:** Tasks in Project Planning; Work Breakdown Structures (WBS); Planning Methods; Development Life Cycle Models; A Generic Project Model. Estimation and Budgeting of Projects: Software Cost Estimation; COCOMO Model; Budgeting.	3
UNIT IV	**Project Scheduling and Monitoring:** Scheduling Techniques – Program Evaluation and Review Technique (PERT), Gantt Chart, Critical Path Method (CPM), Automated Tools. Project Monitoring and Controlling: Project Status Reporting; Project Metrics; Earned Value Analysis (EVA); Project Communication Plan & Techniques; Steps for Process Improvement.	4
UNIT V	**Team Development and Conflict Management:** Basic Concepts; Organization Types – Centralized-control team organization, Decentralized control team organization, Mixed-control team organization.	2

UNIT VI	**Risk Management & Configuration Management :** Concepts of Risks and Risk Management; Risk Management Activities; Effective Risk Management; Risk Categories; Aids for Risk Identification; Potential Risk Treatments; Risk Components and Drivers; Risk Prioritization. Configuration Management: Software Configuration Management (SCM) –Baselines, Software Configuration Items (SCI); SCM Process; Identification of Objects in the Software Configuration; Version Control; Change Control; Configuration Audit; Status Reporting; Goals of SCM.	3
UNIT VII	**Software Quality Assurance:** Software Quality Assurance Activities; Software Qualities; Software Quality Standards – ISO Standards for Software Organization, Capability Maturity Model (CMM), Comparison between ISO 9001 & SEI CMM, Other Standards.	3
UNIT VIII	**Computer Aided Software Engineering (CASE) Tools:** CASE Concepts; Classification of CASE Tools; Steps for CASE Tool Implementation; Integrated CASE Environments; Architecture of CASE Environment	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

1. Perform case studies on cost estimation models like COCOMO, COCOMO II.
2. Implement a Work Breakdown Structures (WBS) for a given specific software application.
3. Comparative analysis on Process Vs Product metrics.
4. Perform Case studies on Project Scheduling.
5. Implement an efficient management strategy for a business scenario.
6. Perform Case studies on Risk Management.

BOOKS RECOMMENDED

1. Bob Hughes, Mike Cotterell and Rajib Mall "Software Project Management", 6th Edition, McGraw Hill Edition, 2017.
2. Pankaj Jalote, "Software Project Management in practice", 5th Edition, Pearson Education, 2017.
3. Dr. P. Rizwan Ahmed, "Software Project Management", 1st Edition, Margham Publications, 2016
4. Walker Royce, "Software Project Management, A Unified Framework", 1st Edition, 2006.
5. Joel Henry, "Software Project Management", 1st Edition, Pearson Education, 2006.
6. Pradeep Pai, "Project Management", First Edition, Pearson, 2019

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal Of Software Project Management And Quality Assurance, Serial Publications
2. International Journal of Project Management, Elsevier
3. Indian Journal of Software Engineering & Project Management, Lattice Science Publication
4. International Journal of Information Technology Project Management, IGI Global

M-451 MANAGING DIGITAL INNOVATION AND TRANSFORMATION

OBJECTIVES

1. To help the learners understand how digital innovation and transformation change the business process and decision making.
2. To provide understanding of analyzing technological innovations that bring change in strategic management.
3. To enable comprehension of the impact of technology enablers in transforming the Business model in different sectors.

LEARNING OUTCOMES

1. Understand of the change in business process and decision making due to digital innovation and transformation.
2. Able to analyze impact of technological innovation on strategic management.
3. Understand the effect of technology enablers in transforming business model.
4. Enhanced understanding of role of technological innovation and transformation on different sectors.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Understanding Digital Innovation:** Digital Innovation, Different perspective of Digitization, Strategic Challenges of Digital Innovation and Transformation, reaping Value from Digitization, Untapped Opportunities, Digital Platforms.	3
UNIT II	**Introduction to Transformation:** Understanding Digital Transformation, The Essentials of Digital Transformations, Business Process Transformations, Stages of Successful Transformation, Challenges of Real Transformation.	3
UNIT III	**Technological Enablers of Digital Transformations:** Digital Disruption, Impact of Artificial Intelligence, Machine Learning, IoT, Block Chain and Social Computing on Transforming Business and Society.	3
UNIT IV	**Strategic Management or Technology and Innovation:** Technological Innovation and Business Strategy, Managing Disruptive Innovations and Technological Transitions, The Technology S-Curve and Its Implications on IS strategies Innovation Strategies, and their Implementation.	4
UNIT V	**Online Technology Mediated Business Models:** Impact of IT on innovation and decision-making within firms, Technology marketing, the critical role of technology-based disruptive innovations to a business.	2
UNIT VI	**Challenges in the Digital Economy:** Organization and cultural issues – building and managing a virtual organization, Management challenges of networked business, Role of leadership and management.	3
UNIT VII	**Managing Transformation:** Cloud computing, change management, process reengineering, testing and training, governance and communications.	3

UNIT VIII	**Application Areas:** Application of Digital Transformation in Different Sectors such as Healthcare, Finance Companies, Marketing, Banking/Insurance.	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

1. Each participant would develop a business plan for his chosen division or organisation based on the concepts learnt in the classroom.
2. Take one existing business model of your choice and discuss how digital innovation and digital transformation changed its business processes and their impact on business.
3. Take any existing Industry that has undergone digital transformation successfully and generate an analytical report for the same.
4. Discuss any one example of digital transformation failure along with factors responsible for its failure.
5. Consider one Healthcare & one retail industry unit and discuss what value digital transformation brought to each one of these.

BOOKS RECOMMENDED

1. Robert D. Galliers, Dorothy E. Leidner, Boyka Simeonova, Strategic Information Management: Theory and Practise, Routledge, 5th edition, 2020.
2. Joe Peppard, John Ward, The Strategic Management of Information Systems: Building a Digital Strategy, Wiley, 4th edition, 2016.
3. Lindsey Herbert, Digital Transformation: Build your Organization's Future for the Innovation Age, Bloomsbury Business; 1st edition, 2017.
4. Michael Lewrick, Patrick Link, Lary Leifer, The Design Thinking Playbook: Mindful Digital Trasformation of Teams, Product, Services, Businesses and Ecosystems, Wiley, 2018.
5. Andreas Hinterhuber, Tiziano Vescovi, Francesca Checchinato, Managing Digital Transformation: Understanding the Strategic Process, Routledge, 2021
6. Dick Whittington, Digital Innovation and Entrepreneurship, Cambridge University Press, 2018

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Advanced Corporate Learning (iJAC), International Association of Online Engineering
2. Journal of Digital Transformation, Institute for Digital Transformation
3. International Journal of Digital Innovation in the Built Environment (IJDIBE), IGI Global.
4. International Journal of Innovation Management, Imperial College Press.

M- 452 ARTIFICIAL INTELLIGENCE FOR MANAGERS

OBJECTIVES

1. Understanding the concepts, theories and application of Artificial Intelligence in Business Management and day to day life.
2. Studying the business situations and applying machine learning and artificial intelligence.
3. Developing the plan for application of AI based solutions for business problems.

LEARNING OUTCOMES

1. Comprehend the Fundamentals, Evolution and Economics of Artificial intelligence.
2. Identify appropriate analytical techniques to solve business scenario problems.
3. Differentiate between various domains of Artificial Intelligence.
4. Identify business constraint and describe, analyze and apply techniques for constraint satisfaction.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** What is Artificial Intelligence, History of AI, Domains of AI, Business Applications of AI, Decision Support Systems and AI, Artificial Intelligence in Economics and Business Research, Rise of big data in business planning, Redefining management using AI.	3
UNIT II	**Foundations of AI:** Acting Humanly-Turing Test Approach, Thinking Humanly- Cognitive Modeling Approach, Thinking Rationally- laws of thought approach, Acting Rationally- Rational Agent Approach. AI techniques, Expert Systems. Intelligent agents, Search, AI Canvas, 7-step process for framing an AI initiative	4
UNIT III	**AI and Business Functions:** Big data and supply chain, AI in logistics, Data driven assortment and personalization, Peer to peer product sharing, AI and service operations, Service innovation in digital age, Consumer and object experience in the Internet of things and digital data streams.	3
UNIT IV	**AI Powered Business Intelligence:** Introduction to Business Intelligence, Advantages, Disadvantages and Trends, Role of AI in Business Intelligence, Components of AI in BI Tools, Adoption of AI in Business, Advantages of AI driven Business Intelligence Solutions, Impact of AI in BI, AI Based BI Applications, Future of AI in BI	3
UNIT V	**AI & Machine Learning:** Fundamentals of Machine Learning, The AI & ML landscape – tools, techniques and platforms. Machine Learning and Deep Learning with understanding of key players in the AI ecosystem. Difference in AI and ML, Application of ML in business.	3

UNIT VI	**AI Applications in Management:** Making the business case for the use of AI & ML Deep Learning for AI, Neural networks & deep neural networks, Applications of deep learning in various scenarios, Necessary conditions for Deep Learning Applications, challenges and limitations of deep learning.	3
UNIT VII	**Data Science:** Data Science, Introduction to Python, Python for Data Science, Data Visualization in Python, Data Analysis Using SQL, Data Analysis in Excel , Analytics Problem Solving – CRISP-DM framework	3
UNIT VIII	**Ethics & Future of Work:** AI & Ethics, Trolley Problem, Capabilities and Limitations of AI and ML.	2

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

1. Understanding the working of smart personal assistants.
2. Smart email categorization.
3. Understanding implementation/working of AI & ML cloud platforms.
4. Sales and business forecasting.
5. Fraud detection and prevention for online transactions.

BOOKS RECOMMENDED

1. Russell, S., Norvig, P. "Artificial Intelligence: A Modern Approach", Third Edition, Prentice Hall, 2010.
2. Khemani, D, " A First Course in Artificial Intelligence" Paperback Edition, McGraw-Hill, 2013.
3. Agarwal, A., Gans, J. & Goldfarb, A, " Prediction Machines", Harvard Business Review Press, 2018
4. Taulli, T, "Artificial Intelligence Basics", Apress, 2019.
5. Rakesh Dandu, "Artificial Intelligence for Managers: For Individuals Aspiring to Get into the AI", Notion Press, 2020.
6. Kevin Knight and Elaine Rich, "Artificial Intelligence", Third Edition, McGraw-Hill, 2017.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Applications of Artificial Intelligence in Machine Learning, IJCA.
2. Artificial Intelligence in Theory and Practice IV, Springer Publications.
3. Introduction to Artificial Intelligence, Springer.
4. Journal of Visualization, Springer.

M- 453 EMERGING TECHNOLOGIES IN DATABASE MANAGEMENT

OBJECTIVES

1. To learn and understand the concepts of Data Base Management.
2. To apply the database management principles.
3. To apply advanced database models .

LEARNING OUTCOMES

1. Understand Database Management concepts.
2. Understand Relational databases.
3. Analyze database and understand normalization.
4. Able to apply data models.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Database Management** Database systems, File Systems, Database v/s File Systems, Database Architecture, Introduction to database models.	2
UNIT II	**The Relational Database Model** A Logical view of data, keys, integrity rules, relational database operators, relationships within the relational database.	3
UNIT III	**Entity Relationship Modeling** Basic Modeling Concepts, degrees of data abstraction, entity relationship model, Degree and Cardinality of relationships, converting an E-R Model into a database structure.	3
UNIT IV	**Normalization** Database tables and normalization, normalization and data base design. Normal forms.	3
UNIT V	**Structured query language** SELECT Statement, distinct clause, handling of null values, ORDER BY clause, WHERE clause, relational operators, logical operators (AND, OR, NOT), SQL Operators, (BETWEEN, AND, IN, LIKE), numeric functions, string functions, date functions, conversion functions, GROUP BY clause, group functions, HAVING clause, joining tables, SET Operators (UNION, INTERSECTION, MINUS), Sub queries.	4
UNIT VI	**Distributed database management system** Distributed processing and distributed databases, DDBMS Components, levels of data and process distribution.	3
UNIT VII	**NOSQL Data Management** Introduction to NoSQL, aggregate data models, key-value and document data models, relationships, graph databases, schemaless databases, materialized views, distribution models, sharding, master-slave replication, peer-peer replication Consistency: relaxing consistency, version stamps.	3
UNIT VIII	**Advanced Data Models** Temporal Databases, Spatial Databases, Multimedia Databases, Deductive Databases, Mobile Databases.	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based PRACTICAL COMPONENT

PRACTICAL COMPONENT

1. Create an ER model of a business organization.
2. Design a database schema for a university system.
3. Suppose that a bank has account table and want to find the list of account holders who have amount less than minimum balance in order of their city. Create a sample table with fields as (account-no, name, address, city, balance). Write proper query to solve the stated problem.
4. Suppose a hotel want to automate its process. Create an ER model and a database design for the same.
5. Suppose that you have data of examination having fields as (enrollment-no, roll-no, student-name, course, obtained-marks, maximum-marks, session). Write proper SQL query to declare the result and assign grades. Grades (A: 90 and above %, B: between 90 and 80, C: between 80 to 70, D: between 70 to 60 , E: Between 60 to 50, and F: Below 50)
6. Design a case study for a new enterprise online business, find it's entities, design ER model and suggest the database model.

BOOKS RECOMMENDED

1. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley, 7th Edition, 2016.
2. Thomas Connolly and Carolyn Begg, "Database Systems: A Practical Approach to Design, Implementation, and Management, Addison Wesley, 6th Edition, 2014.
3. NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, P. J. Sadalage and M. Fowler, Pearson Education, Inc. 2012.
4. Professional NOSQL, Shashank Tiwari, Wrox, September 2011.
5. Korth, Silberschatz, Sudarshan, "Database Concepts", McGraw Hill, 6th Edition, 2010.
6. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill, 3rd Edition, Jan 2007

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Database Management Systems, AIRCC
2. Database Systems Journal, Bucharest Academy of Economic Studies Publishing House
3. Data Mining and Knowledge Discovery, Springer-
4. Journal of Database Management, Timely Knowledge

Business Analytics (Group F)

S. No.	Subject Code	Subject Title
IV Semester		
1	M-460	Data Mining for Business Decisions
2	M-461	Data Visualization for Managers
3	M-462	Business Forecasting
4	M-463	Functional Analytics

M-460 DATA MINING FOR BUSINESS DECISIONS

OBJECTIVES

1. To identify the scope and essentiality of Data Warehousing and Mining.
2. To analyze data, choose relevant models and algorithms for respective applications.
3. To study various classification and clustering algorithms

LEARNING OUTCOMES

1. Understand Data Warehouse fundamentals, Data Mining Principles
2. Design data warehouse with dimensional modeling
3. Identify appropriate data mining algorithms to solve real world problems
4. Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Data warehousing:** What is OLAP, Dimensional Modelling (facts, dimensions), cube, Schema, defining schema's star schema, snow-flakes schema and fact constellation, ETL process.	3
UNIT II	**Data Mining and Knowledge Discovery:** The KDD process and methodology, Data preparation for knowledge discovery	2
UNIT III	**Data mining and Machine Learning techniques**: Overview of tools for Data Analysis, Data Analysis vs. Data Analytics, Types of Data Analytics	2
UNIT IV	**Supervised Techniques:** Introduction to Classification and Prediction Classifying with Probability Theory; Naïve Bayes, Building Decision Trees	3
UNIT V	**Unsupervised Techniques I:** Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, Apriori Algorithm, FP Growth Algorithm	4
UNIT VI	**Unsupervised Techniques II:** Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Introduction to Model-Based Clustering, Introduction to Outlier Analysis, K Medoid Clustering.	
UNIT VII	**Predictive Analytics:** Regression models, Linear and Non linear Regression, Evaluating predictive models	3
UNIT VIII	**Introduction to Soft Computing**: Soft computing vs. Hard computing, Introduction to Soft computing Techniques Neural Network and Genetic algorithms and Their utility in Data mining	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

1. Perform Case Studies Data Mining Techniques.
2. Explore machine learning tool "WEKA"
3. Perform data preprocessing tasks and Demonstrate performing association rule mining on data
4. Load dataset into Weka and perform Decision tree algorithms
5. Perform Regression using Excel
6. Explore other clustering techniques available in Weka.

BOOKS RECOMMENDED

1. Pieter Adriaans & Dolf Zentinge, "Data Mining", Addison-Wesley, Pearson, 2000.
2. Mohanty, Soumendra, "Data Warehousing: Design, Development and Best Practices", Tata McGraw Hill, 2006
3. Jiawei Han & Micheline Kamber, "Data Mining: Concepts & Techniques", Morgan Kaufmann Publishers, 3rd edition, 2002
4. Daniel T. Larose, "Data Mining Methods & Models", Wiley-India, 2007.
5. Vikram Pudi & P. Radhakrishnan, "Data Mining", Oxford University Press, 2009
6. Alex Berson & Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", Tata McGraw-Hill, 2004
7. Margaret H. Dunham & S. Sridhar, "Data Mining: Introductory and Advanced Topics", Pearson Education, 2008.
8. D Israel, "Data Analysis in Business Research", Sage Publications, 2012

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Data Warehousing and Mining (IJDWM), IGI Publication
2. International Journal of Data Warehousing (IJDW), Serial Publication
3. CS&DA - Computational Statistics & Data Analysis, Elsevier, CMStatistics
4. DATAMINE - Data Mining and Knowledge Discovery, Springer
5. TKDD - ACM Transactions on Knowledge Discovery From Data, ACM (Association for Computing Machinery)

M-461 DATA VISUALIZATION FOR MANAGERS

OBJECTIVES

1. To understand how to represent voluminous complex data set.
2. To understand the methodologies used to visualize large data sets
3. To understand the process involved in data visualization and security aspects involved in data visualization

LEARNING OUTCOMES

1. Analyze the concept of data visualization.
2. Explain various visualization options.
3. Design and use various methodologies present in data visualization.
4. Evaluate the process involved and security issues present in data visualization.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Context of data visualization, Definition, Methodology, Visualization design objectives. Key Factors, Purpose, visualization function and tone,	2
UNIT II	**Visualization Design Options**: Data representation, Data Presentation, Seven stages of data visualization, widgets, data visualization tools.	2
UNIT III	**Visualization Data Methods**: Mapping, Time series, Connections and correlations, Scatterplot maps, Trees, Hierarchies and Recursion, Networks and Graphs, Info graphics	3
UNIT IV	**Visualizing Data Process:** Acquiring data, Where to Find Data, Tools for Acquiring Data from the Internet, Locating Files for Use with Processing, Loading Text Data, Dealing with Files and Folders, Listing Files in a Folder, Asynchronous Image Downloads,	3
UNIT V	**Data Visualization using Google Data Studio:** Getting started with Google Data Studio, Data story telling with various charts, Making interactive reports with viewer filters and date range controls, Creating product catalogs, video libraries, and other hyperlinked content, Data visualization art. Connecting data sets to various Google Marketing Platform, including Google Ads, Analytics, Display & Video 360, Search Ads 360, Google Cloud Storage, Social media platforms such as Facebook, Reddit, and Twitter, Sharing and collaborate Data Studio file with another editor, working together in real time as a team.	4
UNIT VI	**Data Visualization with Tableau:** Getting started with Tableau Desktop, Creating the first charts, Filtering and sorting data, Common charts, assembling a dashboard layout, Drilldown between dashboards, Transform the data Creating more advanced chart types Using multiple source tables, Interactions, Advanced visualizations, Creating a data story in Tableau.	3

UNIT VII	**Data Visualization with Microsoft Power BI:** Introduction to power BI - need, importance, power BI cloud and power BI services, Power BI desktop - installation, usage creating power BI reports, auto filters, report visualizations and properties, chart and map report properties, hierarchies and drilldown reports, data analysis expressions (DAX), publish power BI report, working with my work space group.	4
UNIT VIII	**Data Visualization with R:** Introduction and Installation of R studio, Packages for data Visualization, Grammar of graphics using ggplot and ggplot2, Basic Visualization using Histogram, Bar / Line Chart, Box plot, Scatter plot. Advanced Visualization using Heat Map, Mosaic Map, Map Visualization, 3D Graphs, Correlogram, Dendrogram, word cloud.	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

1. Perform data visualization using tools.
2. Comparative study of data visualization methods.
3. Perform case studies on design of sales dashboard, CIO dashboard, Telesales dashboard, marketing analysis dashboard, HR dashboard etc.
4. Use of advanced web techniques for data visualization.
5. Design a dashboard.
6. Create report for vulnerability assessment and exploitation of system.

BOOKS RECOMMENDED

1. S. Margret Anouncia, Hardik A. Gohel, Subbiah Vairamuthu, "Data Visualization: Trends and Challenges Toward Multidisciplinary Perception", Springer Verlag, Singapore; 1st Edition, 2021
2. Claus O. Wilke , "Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures", 1st Edition, O Reilly Media, Inc., 2019
3. Kieran Healy, "Data Viualization: A Practical Introduction", Princeton University Press, 2018
4. Scott Murray, "Interactive data visualization for the web", 2nd Edition, O Reilly Media, Inc., 2017.
5. Steve Wexler, Jeffrey Shaffer, Andy Cotgreave, "The Big Book of Dashboards: Visualizing your data using Real-World Business Scenarios", Willey, 2017
6. Greg Conti, "Security Data Visualization: Graphical Techniques for Network Analysis", No Starch Press Inc, 2007
7. Alexander Loth "Visual analytics with tableau", Willey, 2019
8. Kiran Pandya, "Statistical Analysis In Simple Steps Using R", sage Publications, 2019

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Information Visualization, SAGE Journals
2. Journal of Visualization, Springer
3. Patterns, ScienceDirect, CellPress
4. Journal of Data Science, Statistics, and Visualisation, International Association for Statistical Computing.

M-462 BUSINESS FORECASTING

OBJECTIVES

1. Understand the various concepts of the forecasting in the application of business
2. Understand the various techniques of the forecasting
3. Explain about the techniques employed in the operations planning

LEARNING OUTCOMES

1. Analyze the techniques employed in the operations planning and the types of Forecasts
2. Understand the different types of Data Patterns.
3. Analyze the demand using the regression method and the Exponential Smoothing method
4. Understand the different measures of forecast errors.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Forecasting:** Introduction, Objectives, Features of good forecasting, Nature and uses of forecasts, Forecasting and Decision Making, Types of Forecasts, The Art and Science of Forecasting, Process of Forecasting, Application of forecasting in Business	3
UNIT II	**Data:** Introduction, Data Patterns: horizontal, trend, seasonal, and cyclical, Data for Forecasting: Data Warehouse and Cleaning, Data Transformations: Data Pattern and Appropriate Transformations, Patterns in Time Series Data	3
UNIT III	**Forecasting Techniques:** Forecasting Techniques: Qualitative and Quantitative, Technique Selection, Delphi Method, Interpolation and extrapolation	3
UNIT IV	**Regression Analysis:** Regression Analysis, Simple Regression: Linear Model, Assumptions of the Regression Model, Least Square Method, Multiple Regression, Curvilinear Regression, Binary regression, Logistic regression, Step wise Regression.	2
UNIT V	**Smoothing Techniques:** Smoothing Techniques: naive, averaging and smoothing, Averaging Models: Simple Average and Moving Average, Exponential Smoothing Models;	4
UNIT VI	**Time Series:** Time series analysis, Trend Analysis, Linear Trend and Nonlinear Trend	3
UNIT VII	**Error:** Introduction, Accuracy, Measure, Cumulative sum of Forecast Errors (CFE), Mean Absolute Deviation (MAD)	3
UNIT VIII	**Statistical inferences using Hypothesis testing:** Point and Interval estimation, Parametric Test, Non Parametric Test, Drawing logical inferences from these results	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

1. Study t-test and implement.
2. Implement smoothing techniques.
3. Analyze Forecasting Techniques and regression.
4. Perform a study of Time Series Decomposition.
5. Perform case studies on Forecasting Models.
6. Implement Forecasting with multiple regressions.

BOOKS RECOMMENDED

1. Michael Gilliland, Len Tashman, Udo Sglavo, "Business Forecasting: Practical Problems and Solutions", John Wiley & Sons, 2016
2. Douglas C. Montgomery, Cheryl L. Jennings, Murat Kulahci, "Introduction to Time Series Analysis and Forecasting", John Wiley & Sons, 2015
3. Hanke, John E. Wichern, Dean W.,"Business Forecasting" Pearson, 2014
4. Michael Gilliland, Len Tashman, Udo Sglavo, "Business Forecasting: Practical Problems and Solutions", Wiley, 2010
5. Reza Hoshmand, "Business Forecasting – A Practical Approach", Second Edition, Routledge, Taylor & Francis, New York, 2010
6. Jae K Shim, "Strategic Business Forecasting", Global Professional Publishing, 2009.
7. John T. Mentzer, Mark A. Moon, "Sales Forecasting Management", Sage Publication, 2004

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Forecasting, International Institute of Forecasters
2. Journal of Business Forecasting, Institute of Business Forecasting & Planning
3. International Journal of Business Forecasting and Marketing Intelligence, Inderscience Publisher
4. Journal of Business Economics and Management, Vilnius Tech

M-463 FUNCTIONAL ANALYTICS

OBJECTIVES

1. To understand the basic concepts of financial analytics, Marketing analytics and HR Analytics.
2. To learn statistical and analytical techniques that can be deployed to help better decision making.
3. To understand the role and importance of functional analytics.

LEARNING OUTCOMES

1. Gain an overview of advances in marketing analytics, financial analytics and HR analytics.
2. Understand and apply various statistical analysis methods in financial analytics.
3. Apply quantitative and qualitative analysis to understand trends and indicators in human resource data.
4. Use advanced analytical tools to analyze a variety of data collected by marketers.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Financial Analytics, Statistical concepts:** Financial Functions in Excel, Stock charts, Modelling and forecasting of financial statements, Basic statistical concept for Finance, Financial data Visualization tool, Predictive sales analytics, Client profitability analytics, Product profitability analytics, Value-driven analytics.	3
UNIT II	**Application of data analytics in capital markets**: Downloading and Reading stock market data, Applying technical analysis indicators. Statistics to analyze capital market data.	3
UNIT III	**Introduction to Marketing Analytics:** Hierarchical segmentation, Selecting the "right" number of segments, Segmentation variables, Recency, frequency, and monetary value, Computing recency, frequency and monetary value with R, Introduction to Customer analytics	3
UNIT IV	**Data transformation:** Preparing and transforming your data in R, Running a hierarchical segmentation in R, Managerial Segmentation: Limitations of statistical segmentation, Developing a managerial segmentation, Describing segments, Segments and revenue generation.	4
UNIT V	**Introduction to HR Analytics:** Evolution of HR Analytics, HR information systems and data sources, HR Metric and HR Analytics, Evolution of HR Analytics; HR Metrics and HR Analytics; Intuition versus analytical thinking; HRMS/HRIS and data sources; Analytics frameworks like LAMP, HCM:21(r) Model.	2

UNIT VI	**Diversity Analysis:** Equality, diversity and inclusion, measuring diversity and inclusion, Testing the impact of diversity, Workforce segmentation and search for critical job roles. Recruitment and Selection Analytics: Evaluating Reliability and validity of selection models, Finding out selection bias, Predicting the performance and turnover.	3
UNIT VII	**Performance Analysis:** Predicting employee performance, Training requirements, evaluating training and development, Optimizing selection and promotion decisions.	3
UNIT VIII	**Monitoring impact of Interventions**: Tracking impact interventions, Evaluating stress levels and value-change. Formulating evidence based practices and responsible investment. Evaluation mediation process, moderation and interaction analysis, Introduction to Digital marketing and Web analytics	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

1. Simple Linear Models.
2. Cash flow Simulation.
3. Hierarchical Segmentation Using R.
4. Diversity Analysis.
5. Employee attitude surveys- engagement and workforce perception
6. Predicting employee performance.

BOOKS RECOMMENDED

1. Shonna D. Waters, Valerie Streets, Lindsay McFarlane, Rachael Johnson-Murray, " The Practical Guide to HR Analytics: Using Data to Inform, Transform, and Empower HR Decisions", 2018, Society For Human Resource Management.
2. Fermin Diez , Mark Bussin , Venessa Lee , Fundamentals of HR Analytics: A Manual on Becoming HR Analytical, 2019, Emerald Publishing Limited.
3. Dr. Anuradha B, Financial Analytics and Control Paperback, Notion Press; 1st edition, 2021.
4. Mark J. Bennett , Dirk L. Hugen, Financial Analytics with R: Building a Laptop Laboratory for Data, Cambridge University Press; 1st edition, 2016.
5. Stephan Sorger, Marketing Analytics: Strategic Models and Metrics Paperback, Amazon Digital Services; 1st edition, 2013
6. Wayne L. Winston (Author), Marketing Analytics: Data-Driven Techniques with Microsoft Excel, Wiley, 1st edition, 2014.
7. Annmarie Hanlon, "Digital Marketing: Strategic Planning & Integration", Sage Publications, 2019

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Financial Analysts Journal, CFA Institute.
2. The International Journal of Human Resource Management, Taylor & Francis.
3. Journal of Marketing, SAGE Journals.
4. International Journal of Research in Marketing, Elsevier.

Rajasthan Technical University, Kota

MBA Syllabus

2021-22

THIRD SEMESTER MBA TEACHING SCHEME

THIRD SEMESTER MBA TEACHING SCHEME

S. No.	Course Type	Paper Code	Paper Title	No of Sessions		Credits	Internal/ Minimum Marks	External/ Minimum Marks	Total
				Per Semester	Per Week				
			Theory Courses : Dual Specialization is proposed: Six Subjects (Three from each group) The student will get specialized in two Majors.						
1	PEC1			24	2	3	30/12	70/28	100
2	PEC2			24	2	3	30/12	70/28	100
3	PEC3			24	2	3	30/12	70/28	100
4	PEC1			24	2	3	30/12	70/28	100
5	PEC2			24	2	3	30/12	70/28	100
6	PEC3			24	2	3	30/12	70/28	100
7	MCC		Audit Course	12	1	0	30	70	100*
8	REW	M-316	Summer Training Project Report	48	4	3	120/60	80/40	200
9	PEC1	M-317	Major Lab (Functional Area I)	24	2	1	60/30	40/20	100
10	PEC2	M-318	Major Lab (Functional Area II)	24	2	1	60/30	40/20	100
11	PCC3	M-319	Managerial Skills Development Lab	24	2	1	60/30	40/20	100
12	SODECA		Social Outreach, Discipline & Extra Curriculum Activities	-			-	100/40	100
			Total for III Semester	**276**	**23**	**24**	**510**	**790**	**1200**

***Note:** Marks of audit course will not be considered for credit purpose

List of Functional Areas for MBA (Third Semester)

Group A [FINANCE]

S. No.	Subject Code	Subject Title
Semester III		
1.	M-310	Security Analysis & Portfolio Management
2.	M-311	International Financial Management
3.	M-312	Marketing of Financial Services
4.	M-313	Corporate Taxation
5.	M-314	Banking and Finance

Group B [MARKETING]

S.No.	Subject Code	Subject Title
Semester III		
1.	M-320	Integrated Marketing Communication
2.	M-321	Retail Management
3.	M-322	Sales Distribution and Logistics Management
4.	M-323	Product & Brand Management
5.	M-324	Industrial Marketing

Group C [HUMAN RESOURCE MANAGEMENT]

S.No.	Subject Code	Subject Title
Semester III - Electives		
1	M-330	Training & Development
2	M-331	Strategic Human Resource Management
3	M-332	Manpower Planning
4	M-333	Compensation Management
5	M-334	Human Resource Development

Group D [Operations& Supply Chain Management]

S. No.	Subject Code	Subject Title
III Semester		
1	M-340	Materials Management
2	M-341	Total Quality Management
3	M-342	Manufacturing Planning & Control
4	M-343	Management of Business Process Outsourcing
5	M-344	Export, Import Procedures and Documentation

Group E [INFORMATION TECHNOLOGY MANAGEMENT]

S. No.	Subject Code	Subject Title
III Semester		
1	M-350	Software Engineering
2	M-351	E-Business
3	M-352	Strategic Management of Information Technology
4	M-353	Information Security and Cyber Law

Group F [BUSINESS ANALYTICS]

S. No.	Subject Code	Subject Title
III Semester		
1	M-360	Data Science & Analytics
2	M-361	Data Warehousing & Mining
3	M-362	Big Data Technologies
4	M-363	BlockChain Technologies

M-316: SUMMER TRAINING PROJECT REPORT

Objectives

1. To provide an opportunity for students to apply theoretical concepts in real life world decision making.
2. To sensitize students to the nuances of corporate culture and familiarize them with the corporate code of behavior.

Learning Outcomes

1. To facilitate the fundamental understanding of the functioning and organization of business.
2. Communicate and collaborate effectively and appropriately with different professionals in the work environment to manage resources, work under deadlines, identify and carry out specific goal oriented tasks.
3. To develop ability to take responsibility, make sound decisions and apply technical skills effectively.

- Summer Training Project offers an opportunity to put learning into practice and it also serves as an important experiential channel for students to move towards finalizing their preferences on various specializations.
- At the end of the second semester examination, it is mandatory for every student of MBA to undergo on-the- job practical training in any manufacturing, service or financial organization. The training will be of **6 to 8 weeks** duration. The college/institute will facilitate this compulsory training for students.
- During the training, the student is expected to learn about the organization and analyze and suggest solutions to a live problem. The objective is to equip the students with the knowledge of actual functioning of an organization and problems faced by them for exploring feasible solutions.
- During the course of training, the organization (where the student is undergoing training) may assign a problem/project to the student.
- The student, after the completion of training will submit a report to the College/Institute which will form part of the third semester examination. The report must be submitted after three weeks of Summer Internship completion. The report (based on training and the problem/project studied) prepared by the student will be known as Summer Training Project Report. It

should reflect in depth study of an organization where the student undergoes training.

- One comprehensive chapter must be included about the organization where the student has undergone training. This should deal with brief history of the organization, its structure, performance, products/services and problem faced. This chapter will form Part 1 of the report. Part 2 of the report will contain the study of problem undertaken during training. The average size of report ordinarily will be of minimum **100 pages** in standard font size (12) and double spacing. Two neatly typed (one sided only) and soft bound copies of the report will be submitted to the College/Institute. The report will be typed on A-4 size paper.
- The report will have three certificates, one by the Head of the Department, another by the Faculty guide and third one from reporting officer of the organization where the student has undergone training. These three certificates should be attached in the beginning of the report.
- The Summer Training Project Report comprises of 200 marks and will be evaluated by two examiners (external and internal). The evaluation will consist of (1) Project Report evaluation (2) Project Presentation and Viva Voce. The Project Report evaluation will comprise of 120 sessional marks and would be evaluated by internal project guide. The Presentation and Viva Voce would comprise of 80 marks and would be evaluated by two examiners (1 external and 1 internal).

Break-up of components for evaluation of Summer Training Project Report

<table>
<tr><th></th><th colspan="8">Components</th><th>Marks</th><th>Total Marks</th></tr>
<tr><td rowspan="9">Internal Evaluation Criteria</td><td colspan="8">Interaction with Mentor/ faculty supervisor</td><td>20</td><td rowspan="9">120</td></tr>
<tr><td colspan="8">Project daily-activity record</td><td>20</td></tr>
<tr><td colspan="8">Project Report Internal Evaluation: Evaluation Criteria</td><td rowspan="8">80</td></tr>
<tr><td>SN</td><td></td><td>Unsatisfactory</td><td>Satisfactory</td><td>Good</td><td>Excellent</td><td>Score</td></tr>
<tr><td></td><td></td><td>4</td><td>8</td><td>12</td><td>16</td><td></td></tr>
<tr><td>1</td><td>Understanding of Objectives and relevance with topic</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Research Methodology</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Data Analysis &Interpretation</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Conclusion and</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

			Recommendations						
		5	Presentation Query handling						
External Evaluation Criteria		**Project Report External Evaluation: Evaluation Criteria**							80
		SN		**Unsatisfactory**	**Satisfactory**	**Good**	**Excellent**	**Score**	
				4	**8**	**12**	**16**		
		1	Understanding of Objectives and relevance with topic						
		2	Research Methodology						
		3	Data Analysis & Interpretation						
		4	Conclusion and Recommendations						
		5	Presentation Query handling						

- It is mandatory that the student will make presentation in the presence of teachers and students. The student is expected to answer the queries and questions raised in such a meeting.
- The student shall prepare the Summer Training Report as per the format given in the Summer Training Manual as prescribed by the University
- The students will also be required to submit a completed feedback form from these summer organizations.

Annexure A

Student's Name:
Programme:

SUMMER TRAINING APPRAISAL

You are requested to provide your opinion on the following parameters.

4: Excellent **3: Good** **2: Satisfactory** **1: Unsatisfactory**

1. Technical knowledge gathered about the industry and the job he/she was involved. □
2. Communication Skills: Oral / Written / Listening skills □
3. Ability to work in a team □
4. Ability to take initiative □
5. Ability to develop a healthy long term relationship with client □
6. Ability to relate theoretical learning to the Summer Training Project □
7. Creativity and ability to innovate with respect to work methods & procedures □
8. Ability to grasp new ideas and knowledge □
9. Presentations skills □
10. Documentation skills □
11. Sense of Responsibility □
12. Acceptability (patience, pleasing manners, the ability to instill trust, etc.) □
13. His/her ability and willingness to put in hard work □
14. In what ways do you consider the student to be valuable to the organization? □

Consider the student's value in term of:

(a) Qualification □
(b) Skills and abilities □
(c)) Activities/ Roles performed □

15. Punctuality □

Any other comments _____

Assessor's Overall rating □

Assessor's Name:
Designation:

Organization name and address:
Email id:

Contact No:

Annexure B

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

SUMMER TRAINING PROJECT

(Instructions & Guidelines)

Training Methodology and
Training Report Preparation .....
Training Methodology: Tips .....
Guidelines for Training.....

Enclosures:

1. Specimen of Certificate
2. Specimen of Title Cover
3. Training Evaluation Form
4. Feedback Form

IMPORTANT:

1. Summer Training Project during summer at the end of 2nd Semester will be held for 6-8 Weeks. Students have to work on a project. Industrial and Technical visits should also be organized.
2. Students will have to give presentation on their Summer Training Project after coming back. One slot of 2 periods per week is to be provided in 3rd Semester for presentation.
3. For Summer Training Project 200 marks are assigned in 3rd Semester

FOREWORD

This document will serve a reply to several queries right from choosing a training site to submission of the report.

The main purpose of Summer Training Project is to prepare students for employment in their chosen discipline at the conclusion of two years of postgraduate studies.

Summer Training Project helps to gain first- hand experience of working as management professional, including the technical application of management methods. It provides opportunity to work with other management professionals. During training period a student can experience the discipline of working in a professional organization and can also develop technical, interpersonal and communication skills. It also facilitates the fundamental understanding of the functioning and organization of business.

Many companies regard this period as a chance to assess students for future employment. The ability to take responsibility, make sound decisions and apply technical skills is highly regarded. Further, students can also evaluate companies for which they might wish to work or make decisions about fields of management, which they enjoy.

You should make considerable effort and give sufficient thought obtaining the most relevant and effective Summer Training Project. It is difficult but desirable to obtain experience in a range of activities including design, analysis and experimental and on-site activities.

TRAININGMETHODOLOGYANDTRAININGREPORTPREPARATION

SUMMERTRAININGPROJECT

Summer Training Project forms an integral component of any professional course like Management. The real problem a manager faces and tackles live problem is the industry and the field. The institute where he pursues his studies cannot provide him that practical knowledge on all aspects of learning. Often the study of a subject is said to be incomplete until the student has been exposed to its practical aspects. The theoretical studies build the manager in him by providing him pools of knowledge whereas the practical applications make him agile and competent. If theoretical knowledge teaches him the principles and policies, the practical exposure tells him how to use those principles.

EXPECTATIONS

Training may be defined as a short-term process utilizing a systematic and organized procedure by which training personnel acquire technical knowledge and skills for a definite purpose. It provides an opportunity for students to apply theoretical concepts in real life situations at the work place. It is to sensitize students to the nuances of corporate culture and familiarize them with the corporate code of behavior. It enables students to manage resources, work under deadlines, identify and carry out specific goal oriented tasks. Further, it enables students to discover their professional strengths and weaknesses and align them with the changing business environment. A management trainee, while undertaking training must keep in mind these objectives.

A student is expected to complete his Summer Training Project with the sole objective of enhancing his practical knowledge. A successful training should be in accordance with the needs and objectives set before hand. Ask yourself these questions.

1. What do you want and hope to accomplish through training?
2. Should the training be formal or informal i.e. what are going to be your training priorities?
3. When and where should training be taken?
4. How should training be related to your curriculum and how much independent of it?

Summer Training Project must be undertaken only in an actual job environment and using only the tested principles and methods of learning like instructional methods,

demonstrations and examples. He must ensure that the training site has such arrangement and environment that will assist him in achieving these objectives.

SELECTIONOFTHESITE

The student trainees must ensure that the training site will provide him full opportunity not only to learn the practical applications of the subject chosen but also help him to achieve the above stated objectives and expectations.It will always be better if he chooses a site that will offer him an opportunity to develop multi-disciplinary interests along with the pursuance of a certain training program. He must also look forward for getting an opportunity of placement in the same company/site after completing his degree. Often, the impression made during the training has a long lasting effect.

TRAINING REPORT

A technical report is an account, usually in detail, of some matter such as (a) a work completed or in progress, (b) findings from an investigation, information, search or study; (c) solution to a problem and/or (d) offering of specific theoretical of practical data. While undertaking training and pursuing a project, the management student must be involved in one or more of these activities.

ANATOMY OF A TRAINING REPORT

A well-organized report is divided into easily recognizable parts arranged in an effectual sequence. A training report is a formal report, which is a full scape, detailed tightly structured document. It may contain the following parts arranged for effective communication in the report in the sequence shown as below:

Front Matter

Title Page

Letter of Transmittal

Certificate

Preface

Acknowledgement

Table of Contents

Lists of Illustrations

Main Text

Introduction (Chapter 1)

Discussion (Body of the report)

Conclusion and Recommendations (last chapter)

Back Matter

Appendices

References

Bibliography

HOW TO BEGIN WRITING

A time proved good way to write a report is first to subdivide the job into essential steps and then to complete the corresponding parts step by step. Follow these steps carefully while preparing training or a project report.

Step 1: Preliminary Planning

The writing of a report proceeds more confidently and smoothly if the trainee understands the true nature of the desired end products. He must also know where he is heading for and how far he has progressed toward completion at any instant. This requires careful planning and scheduling. Planning is a flexible process because it must be adjusted to suit every individual's requirement. He must prepare a time schedule and a deadline on which the report must be completed.

Step 2: Collecting Material

Factual material counts principally of data obtained through tests and measurements, investigations, studies, surveys, observation and analysis of such data, calculation and prediction and recommendations too. No attempt should be made to insert the theoretical principles found in the textbooks.

The need is also felt to maintain a daily diary giving full details of day-to-day activity. This also serves as a record and ready references of the training schedule at a later stage. This diary is also to be submitted along with the report.

Step 3: Making an Outline

After the material has been collected, it must be organised and written upon in a well- ordered pattern. To achieve this, the student must decide which topic should be discussed first, which next and so on. The plan for this sequence is the outline. An outline is a safeguard against repetition and omission and a guide to stratification of the subject matter. Report writing moves faster when it follows an outline. It also imparts to the report a degree of unity and coherence. It is always advisable to prepare a written outline as soon as the collected material has been scrutinized. This will help the student to establish a relationship between the various topics of the report. An outline shall also help him to think analytically about the subject.

Step 4: Writing a Rough Draft

When the trainee has collected and sorted the material and completed the outline, this initial writing step will produce the first version of the report. It will however, be seen only as a piece of connected prose derived from the mass of notes and other material. It will lack quality, both technical and rhetorical that is why it is called a rough draft. But it is a trial version of the written report.

Often the trainee faces the difficulty in writing the first draft. The only solution is "start writing at once whatever you have reviewed through collected material and the outline." Therefore, the first advice is to start writing immediately. The second is to write fast putting your thoughts on paper before you forget them. This means you

should not stop to make corrections or beautify sentences. You should only record the ideas as they come, giving no thought at the time to correct spelling, grammar, and sentences structure and paragraphing. Once the material is on paper, it can easily be corrected.

Always use your favourite method of writing long had with personal abbreviations refer freely to illustrations and tables or sketches. The sole criterion is your ability to read the draft. Do not hesitate to include line drawings, half tone pictures, flow diagrams, graphs and charts.

Step 5: Revision and Rewriting

This is the improvement phase for correcting the mistakes in the rough draft, adding items, which were forgotten, or which have lately been suggested, removing items, which have been proved irrelevant or superfluous. During this phase, the student is concerned with all the details that he temporarily ignored for the sake of speed while writing the first draft such as language mechanisms, style, technical accuracy and so on. He should now try to view the rough draft dispassionately as if he is correcting somebody else's writing faults. As he reads the rough draft, he should be alert for errors and bad writing of all kinds.

It is better to make three separate readings, concentrating each time on one correction area:

1. Read the rough draft first time for technical accuracy and avoid worrying about other matters. Ask these questions: Is the technical content true and clearly presented? Are there errors and contradictions?
2. Read the second time for logic. Ask whether the topics follow a meaningful sequence and whether the conclusions are valid.
3. Read the third time for language mechanisms. Be critical of every sentence, check grammar, spelling, punctuation, sentence structure and sentence variety. Ask whether the draft lacks unity and coherence.

During each reading, make your corrections, additions, deletions on the rough draft itself. Then prepare that to the second draft incorporating all the revisions. Again read and revise the second draft for any additional revisions and visualizing whether its contents are ready for final presentation.

Step 6: Final Draft

Working on the final draft is largely mechanical and of productive nature. The final draft is made ready for the reader or the evaluator/examiner and this is the last change to correct mistakes, polish the writing and systematize the structure.

This step requires gathering together of all material, which has been prepared or collected in the preceding phases and the consolidation of the material. This includes the revised draft, illustrations and supplementary material. Prepare the last version of the report by putting all the material together. Illustration must be inserted, pasted or drawn onto the pages of the final draft itself. Number the text pages with Arabic numerals.

Follow these six steps to prepare your report and get the satisfaction of having authored and produced a work of which originality you can claim. Any short cut

methods, copying from the reports of predecessors and just repeating what others have earlier written, clearly show the lack of enthusiasm and initiative on the part of the trainees. Such reports, at the time of evaluation, fail to draw any attention and are rated as under-average or average reports. On the other hand, if the report displays the trainee's hardwork, his initiative, his enthusiasm and real effort in making that report, it is rated as a work of merit. Such a report will always create a good impression at any instance when it is submitted for scrutiny.

There are some parts of the report, which cannot very well be written until all information is final and the pagination is complete. These parts are:

1. Abstract
2. Letter of transmittal
3. Acknowledgement
4. Preface or foreword
5. Index / Table of Contents

All this material is front matter and should be composed in rough draft and carried through revisions as necessary. The abstract must give the gist of the report analytically outlining what the trainee has worked on. In the acknowledgement, all sources from where help has been derived during the training should be duly acknowledged. This includes, besides teachers of the college, such persons like training manager, supervisors, superintendents and other technical staff. The preface is an account justifying why that site / topic was chosen and what inspired the student in due course. This shall also include a brief description of what he is going to present in the report, the abstract of its contents and the structure. Any additional illustrations, graphs sketches and tables are to be appended at the end. Finally, an index or a list of contents is prepared with pagination and chapter names and numbers. Ensure that chapterization is strictly in accordance with the outline of the report and no sections/sub- sections have been left out.

Project Work during Training

Often during the training a single student is given a project to complete. The project is solely to give you an opportunity to become well versed with a specific section of the training site or get an exposure of its working methods. It is also possible that the project is a part of their routine work, survey or investigation, and by undertaking the project the student is only going to assist them. Whatever is the mode or purpose of the project, show diligence and enthusiasm? You must adopt an inquisitive approach, finding more about the project, its specifications and utility. If possible, complete the project (or component) before completing your training and submit the account of your work in the form of a project report. This report shall serve as an evidence of the work done. If the project is a part of your training program, it must always be included in your report. Otherwise also, such an inclusion in the training report shows the innovative bent of your mind. The evaluation becomes much easier since it clearly indicates that training was not just a routine excursion for you but an opportunity to learn and add something to your knowledge. And you have availed of that opportunity fully.

The project entrusted to the trainee will always be related to advances in Management pertaining to Marketing, Finance, HR, Operation & Supply Chain Management, IT, Business Analytics etc. It will also be linked with one or more of the activities of the plant/training centre. Often their personnel, from technical, administration, finance or HRD, will also be involved in that Project. Try to get a separate testimonial for your project work from one of the officials.

TRAINING METHODOLOGY: A FEW TIPS

A lot of mistakes can be avoided and improvement can be made if certain measures are adopted before proceeding on the training and during the later phases.

BEFORE THE TRAINING

1. Read the instructions carefully in this training manual and follow them strictly to avoid any complications of any nature.
2. Fill up the necessary forms and letters and Performa's provided in this manual.
3. Stick to the information supplied regarding the training site, confirmation etc. In the event of any change of training site or any other matter, inform the Training Officer of your institute immediately before proceeding on training.
4. The students are required to carry their identity cards, and two recent passport size photographs for verifications, gate pass etc.
5. They are also required to carry and furnish their personal bio-data, bonds, securities and clearance certificates issued by the police for various purposes of training.
6. They should also ensure their accommodation etc. because normally training centres do not provide hostel facilities.

DURING THE TRAINING

1. The student should reach the training centre well before the date of commencement of the training. They should also intimate about the commencement of training to Training Officer of your Institute as early as possible or within two days of joining their training
2. They must be regular, punctual and well behaved. They should not leave the training centre without the prior permission of the Training Supervisor.
3. They should maintain a daily diary to be checked and signed by the training supervisor from time to time. If required they must prepare a daily / weekly report and submit it to the supervisor.
4. They should take safety precautions as normally no compensation for any accident is payable to the trainee. They should also abide by the rules and regulations of the training organization.
5. While visiting the different sections of the training centre, they should collect the practical / data. They should also inquire the reasons for any deviations from the standard theoretical values. They may also collect information about personnel working on the site/ field / job regarding their qualification, experience etc. Remember that it will not be possible to revisit the training centre to collect material or rebuild the training experience once the training is over. All these data should be prominently included in the training Report. They should also study relevant trade literature collected from site / office / market. All these should be suitably incorporated in the training report.

6. At the end of the training they must clear their dues and other expenses incurred by them at the training centre including the damages, if any. They must also get a formal relieving certificate / no dues certificate before leaving the centre.
7. Collect a certificate of training upon completion, which should indicate the period of training, the nature of work involved during the training and the performance of the student.

AFTER THE TRAINING

1. Always prepare the outline of the training report just 2 or 3 days before the completion of the training. Upon completion put all the material together and arrange them according to daily diary or the outline.
2. Consult your outline with training supervisor before leaving and also discuss it with the teacher regarding important contents of the report. They will furnish all necessary details, guidelines and literature, which will help you to prepare the report.
3. Always follow the 6 step method described in this manual for writing your training report. This is necessary to systematize and accelerate your work.
1. Always work with deadlines while writing chapters and finish them as visualized. Do not make any last minute entries or contribution as it may not be possible to revisit the training centre or recast the training experience.
2. Make good presentations of the report; neatly typed, with hardbound cover containing all the required details. Often-in campus interviews or direct interviews your training / project reports are evidence of your hard work, intellectual interests and even temperament.

GENERAL GUIDELINES FOR TRAINING:

This consists of important areas on which a student should collect relevant information while undergoing Summer Training Project in an organization:

Broad Areas-

1. Inputs- Raw Materials
2. Production Process
3. End Products and Specification
4. Organizational Structure
5. Financial setup
6. Sales and Marketing strategies
7. Plant Design
8. Materials Management system
9. Quality Control System
10. Management Information System
11. Utilities and Waste Management

12. Plant Economy
13. Human Resource Management

The guidelines for above-mentioned broad areas are as below:

1. Inputs: Raw Materials, details of raw materials pertaining to various products including quantity, specifications, sources of supply, vendor location, geographical availability, procurement cost, etc.
2. Production Process: Process flow diagram of manufacturing process, various stages in production.
3. End Products and Specification: List of final products, market growth of products, product demand and supply, competitors, customers for products
4. Organizational Structure: Organization chart for the whole organization showing various levels of authority, span of control at each level, type of arrangement at each level in terms of line, line and staff and functional details etc.
5. Financial setup: Balance sheet, Profit and Loss account and other financial instruments.
6. Sales and Marketing strategies: Various sales and marketing strategies employed by the organization must be studied.
7. Plant Design: Capacity of plant, its measurement and utilization, Plant Size, location and layout.
8. Materials Management System: Procedure adopted in stores for receipt of raw materials, goods and components, various forms and documents used for movement of materials and issue authorization, stores organization; centralized or decentralized, codification methods used for different materials, system of replenishment for inventory items, controls like ABC analysis, procedure for indenting spares etc.
9. Quality Control System: Methods used for controlling quality of raw materials, process and manufactured items, SQC application, testing machines used, implementation of ISO 9000.
10. Management Information System: Documents/reports used for information system at operational, tactical and strategic levels, communication network at various levels, organization of coordination meetings and decisions taken.
11. Utilities and Waste Management: List of utilities and auxiliary services needed, Information about waste generated, methods of reducing waste, environment pollution problems created ash disposal, and effluent treatment system.
12. Plant Economy: Project costing, components of production cost- direct and indirect, financial analysis- balance sheet, income statement, accounting for inventory, breakeven/profitability analysis.
13. Human Resource Management: Recruitment policy, retention policy to reduce turnover rate, employees benefits etc.

(Specimen of the certificate to be submitted with the training report)

CERTIFICATE

Ref. No.:

This is to certify that Mr./Ms. _____ son/daughter of Sh. _____ a student of _____ (class) _____ (session) from _____ (institute) has undertaken Summer Training Project at our organization concern from _____ to _____. The nature of work seen and observed/ studied/ performed by him/her during the training was _____ . (kindly give the description)

His/her performance and conduct during the training was found satisfactory/ good/ excellent.

Place :
Date:

Signature
(Official Seal)

NOTE: This certificate should be from an authentic officer not below the rank of Executive.

(Specimen of the title cover of the training report)

PRACTICAL TRAINING REPORT

SUBMITTED BY

Name	:	_____
		(In Capital Letters_
Institute Roll No.	:	_____
Session	:	_____
Training Period	:	_____ to _____ days _____

SUBMITTED TO

Professor & Head
Department of Training & Placement

Name of the College

SUMMER TRAINING PROJECT EVALUATION FORM

Name of Student_____ Institute Roll No. _____

Session _____

Name of Organization _____

Address _____

Place _____ Pin _____ Phone _____ Fax No. _____

Duration of Training Period from _____ to _____ No. of Working Days _____

1) How to you rate the overall training programme as an educational experience?

Excellent ( ) Very good ( ) Good ( ) Fair ( ) Poor ( )

2) To what extent will it help you in future?

To large extent ( ) To some extent ( ) Negligible extent ( )

3) Indicate subject/ area to which training was found relevant.

_____

_____

4) Indicate the level of interest taken by the training organization

High ( ) Moderate ( ) Low ( )

5) Any other comments/ suggestions

_____

_____

Dated : _____

Signature of the Students

Note: A free and frank assessment of the Training experience would be helpful in improving the Training Programme.

FEED BACK FORM

1. Name of the Industry : _____
2. Concerned Group : _____
3. Turn Over (in terms of Capital) :_____ (in terms of Product)
4. Work Force :
5. Description of Product Range: _____
6. Description of Process: _____
7. Area of Training: _____
8. Contact details of the Person responsible for Summer Training Project:
    a. Name of contact person: _____
    b. Designation: _____
    c. Communication address: _____
    d. Phone No. with STD code: _____
    e. Mobile No. : _____
    f. Email Address: _____

Name of the student : _____

Institute Roll No: _____

Class: _____

Phone : _____ Mobile No. : _____

Email: _____

Dated : _____

Signature of the Student

Major Lab (Functional Area I &Functional Area II)

Semester III (M-317 & M-318) & Semester IV (M-417 & M-418)

Course Objectives:

1. To give industry exposure to students by complementing traditional classroom teaching/learning with focus on group activity, field work, experiential learning, self-study projects, Industry Exposure.
2. To imbibe Research acumen in students thereby developing Inter-personal, Analytical, Cross-Cultural and Entrepreneurial Skills to aid them in establishing and managing their careers in chosen field of specialization.

Learning Outcomes:

1. Develop critical skills, practical knowledge and aptitude in the area or specialization.
2. Demonstrate the ability to probe into real life problems through an analytical approach.
3. Acquire skills specific to area of specialization in accordance with the corporate requirements.

Guidelines:

- The Lab work would comprise of total four Practical Component/Field based assignments out of 12 Practical Component/Field based assignments of Dual Majors opted by a student in III Semester and IV Semester. For example if a student has opted for first major as Finance and second major as Marketing then in course M-317 & M-318 the lab work would comprise of 02 Practical Component/Field based assignments of Finance (two out of total of 06 projects in three papers opted in first major) and 02 Practical Component/Field based assignments of Marketing (two out of total of 06 projects in three papers opted in second major). Similarly, in IV Semester in course M-417 & M-418 the lab work would comprise of 02 Practical Component/Field based assignments of Finance (two out of total of 06 projects in three papers opted in first major) and 02 Practical Component/Field based assignments of Marketing (two out of total of 06 projects in three papers opted in second major). Thus, a student will work on

four Practical Component/Field based assignments in Semester –III and four Practical Component/Field based assignments in Semester-IV.

In addition to it each student in the Major Lab-Functional Area I & II (Semester III & IV) will also undertake hands on experience on any one software pertaining to the functional area along with any one Book Review related to the Functional Area as depicted in the table below:

- Practical Component/Field Based Assignments (To select 02 out of 06 Proposed against the three papers opted by student in the Functional Area I and Functional Area II respectively.)
- Hands on practice on any one software.
- Book Review (Any one).

- The students shall work on the Major Lab-Functional Area I & II (Semester III & IV) for the below mentioned Functional Areas as per the details enclosed herewith.

S.No.	Subjects	Group
1	Financial Management	Group A
2	Marketing Management	Group B
3	Human Resource Management	Group C
4	Operations and Supply Chain Management	Group D
5	Information Systems	Group E
6	Business Analytics	Group F

- There shall be regular class room interactions as per the number of hours allotted to it.
- The reports shall be prepared using word processor Viz., MS word, using Times New Roman font sized 12, on a page layout of A4 size with 1" margin on all sides and 1.5 line spacing. Each Major Lab-Functional Area I & II (Semester III & IV) shall not exceed 60 pages.
- In course M-317 & M-318 student will prepare a report and PowerPoint Presentation of projects undertaken in each of dual majors i.e. two reports (one report and presentation of first major opted by the student and one report and presentation of second major opted by the student in III Semester). The student will submit one hard copy and one soft copy of each

report in PDF file (Un-editable format) to the Institute on the date prescribed by the Institute or one week before the commencement of the examination. Similarly, in course M-417 & M-418 in IV Semester student will prepare a report and PowerPoint Presentation of projects undertaken in each of dual majors i.e. two reports (one report and presentation of first major opted by the student and one report and presentation of second major opted by the student in IV Semester). The student will submit one hard copy and one soft copy of each report in PDF file (Un-editable format) to the Institute on the date prescribed by the Institute or one week before the commencement of the examination.

- Major Lab-Functional Area I & II(Semester III & IV)carries 100 marks consisting of 60 marks for internal evaluation by the internal examiner, 40 marks for external evaluation by external examiner through viva-voce examination. The Major Lab-Functional Area I & II(Semester III & IV) will be evaluated by two examiners (external and internal). The evaluation will consist of (1) Report evaluation (2) Presentation and Viva Voce.
- Course M-317 & M-318 carries 100 marks consisting of 60 marks for internal evaluation by the internal faculty, 40 marks for external evaluation through Presentation/Viva-voce examination.
- Course M-417 & M-418 also carries 100 marks consisting of 60 marks for internal evaluation by the internal faculty, 40 marks for external evaluation through Presentation/Viva-voce examination.
- It is mandatory that the student will make presentation in the presence of faculty and students. The student is expected to answer to the queries and questions raised in such a meeting.
- Break-up: of components for evaluation of Major Lab Functional Area I & Functional Area II (Semester III and IV) is as follows:

Internal Evaluation Criteria

	Components	Marks	Total Marks
Internal Evaluation Criteria	Attendance	05	60
	Class Participation and Interaction	05	
	Practical Component/Field Based Assignments :(2x15)	30	
	Hands on practice on any one software	10	
	Book Review(Any one)	10	

External Evaluation Criteria — **External Evaluation: Evaluation Criteria** — Total Marks: 40

SN		Unsatisfactory	Satisfactory	Good	Excellent	Score
		2	4	6	8	
1	Understanding of Objectives with topic					
2	Understanding of Reliance of topic					
3	Interpretation & Analysis					
4	Presentation					
5	Query handling					

Course Title
Finance (Group A)
Semester III

Course Objectives:	1. To develop a practical outlook among students regarding financial concepts and tools. 2. To inculcate problem solving acumen among students for addressing problems related to the field of finance.
Learning Outcomes:	1. Students will be able design portfolios of investors based on market conditions. 2. Students will be able to successfully apply theoretical concepts of finance in the real financial world. 3. Students will be able to acquire practical skills required by financial service sector industry.

S.No.	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	M-310 - SECURITY ANALYSIS & PORTFOLIO MANAGEMENT	
	Title/Activity	1. Develop a portfolio comprising five listed shares on Indian stock Exchange considering the current market scenario. Following points should be kept in mind while designing the portfolios a) The choice of stocks should be based on detailed analysis done on past performance of the companies. b) Portfolios have to be designed from the perspective of two types investors who are planning to exit in short run and who are planning to stay in market for long run. c) Describe the current scenario under which the portfolio is being developed – Bullish or bearish. d) Calculate the risk and return component based on the observations made during the month. 2. Conduct a survey of 50 respondents through a questionnaire to know their financial planning, investment patterns in equity, debt and insurance products.
	M-311-INTERNATIONAL FINANCIAL MANAGEMENT	
	Title/Activity	1.Study and document India's Current Account (BOP) transactions for last five years. Examine and comment on the constituents of Current Account transactions that affect BOP surplus/deficit for the said study period. Also suggest remedies for BOP deficit, if any. 2. Examine and prepare a report on the constituents of Capital Account. Analyze the trend of FDI and FPI inflows in the Capital Account during the study period and indicate their impact on the Indian Economy and volatility in the Indian Financial Markets.

	M-312-MARKETING OF FINANCIAL SERVICES	
	Title/Activity	1. Study and prepare report on marketing strategies adopted by any three broking firms of India for selling financial products and services. 2. Conduct a questionnaire-based survey of 50 respondents taking their feedback on their perception towards banking, insurance or any financial services companies and services offered by them.
	M-313-CORPORATE TAXATION	
	Title/Activity	1.Study and prepare a report on tax planning of any three firms with reference to their financial management decisions for past three years. 2. Critically assess and prepare a report on the effectiveness of GST collection since its launch.
	M-314-BANKING AND FINANCE	
	Title/Activity	1. Prepare a report on electronic payment systems used by the banking industry and online payment gateways. 2. Study and document different lines of credit offered by the banks to retail customers in India.
2.	**Hands on Practice Software**	1.R Software 2.E-Views (Student version free download) 3.Money Bhai 4.Investar 5.Zoho Books (Trial Version)
3.	**Book Review**	• Benjamin Graham(2013)The Intelligent Investor, Harper Business • Morgan Housel ,The Psychology of Money(2020),Jaico Publishing House • Saurabh Mukherjea(2018)Coffee Can Investing: The Low Risk Road to Stupendous Wealth, Portfolio

Books Recommended:

1. Prasanna Chandra Investment Analysis and Portfolio Management, Tata McGraw Hill ,2017.
2. S. Kevin, Fundamentals of International Financial Management, PHI, EEE, 2012.
3. Dr. Vinod K Singhania & Dr Monica Singhania, Corporate Tax Planning and Business tax Procedures, Taxmann Publication, Latest Edition
4. V.A. Avadhani Marketing of Financial Services, Himalaya Publishing House, 2013.

Course Title
Marketing (Group B)
Semester: III

Course Objectives:	1. To determine when and how to use various functions of Marketing such as sales promotion, personal selling, direct marketing, New product development strategy, Brand Management etc. 2. To comprehend market realities and devise effective strategies to win over competition and gain market share.
Learning Outcomes:	1. To acquire knowledge, concepts, tools necessary to overcome challenges, and issues of marketing in a changing technological landscape. 2. Understand facets of software in marketing & develop in depth understanding of Softwares used in Marketing Practices. 3. Systematically identify relevant marketing theory and concepts, relate these to appropriate methodologies and evidence, apply appropriate techniques and draw appropriate conclusions.

S.No.	Component	
1.	**Practical Component/Field Based Assignments**	
	M-320-INTEGRATED MARKETING COMMUNICATION	
	Title/Activity	1. Pick a brand and gather all its marketing communication materials. How effectively has the brand mixed and matched marketing communications? Has it capitalized on the strengths of different media and compensated for their weaknesses at the same time? How explicitly has it integrated its communication program? 2. Choose a popular event. Who sponsors it? How are they building brand equity with their sponsorship? Are they integrating the sponsorship with other marketing communication?
	M-321-RETAIL MANAGEMENT	
	Title/Activity	1. Visit a kirana store and a supermarket and compare the following: a) store arrangement b) Number of brands carried. c)pricing policies (discount policy) d)service quality. 2. Visit a department store and evaluate the in-store marketing effort .Which categories or brands seem to be receiving the biggest in-store push? What unique in-store merchandising efforts do you see?

	M-322-SALES DISTRIBUTION AND LOGISTICS MANAGEMENT	
	Title/Activity	1. Interview three salesperson and write a brief report about what they like and dislike about their jobs, their salary, travelling allowances, sales quotas, Territorial Plans, Reasons for choosing career in Sales and Qualities required to be successful in sales. 2. Identify Area sales manager of 5 different FMCG companies. Follow the trail of each sales call, the number of calls made and how and on which activities he/she spends time. Research suggests that about 50% of their total time is spend on sales and services and rest time is spend on other administrative functions. Make a list of these tasks and the percent of time spent by each ASM in completing each task. Also perform a comparative analysis of distribution channel of these five FMCG companies.
	M-323-PRODUCT & BRAND MANAGEMENT	
	Title/Activity	1. Pick a brand. Identify all its brand elements and assess their ability to contribute to Brand equity. Also mention, your favourite brand characters? Do you think they contribute to brand equity in any way? Can you relate their effects to the customer based brand equity model? 2. Pick a brand assess its effort to manage brand equity in the last five years. What actions has it taken to be innovative and relevant? Can you suggest any changes to its marketing program.
	M-324-INDUSTRIAL MARKETING	
	Title/Activity	1. Conduct one week of Industry survey in the context of B to B marketing by visiting minimum five companies. Carefully study their Product Development and promotion strategies . The data collected can be analyzed using appropriate statistical software and report the findings. 2. Identify one company predominantly in the industrial marketplace from one of the following industries: Manufacturing, general services, professional services, information/ communications technology, media, wholesaling, and financing. For the selected company: • Briefly describe company's industrial products and services. • Identify at least one B2B customer of the company. Evaluate the relationship between the company and the customer.

		• Analyse the company's customer value proposition and competitive differentiation in the business markets.; • Explain the differences between the marketing practices of this company and those often adopted by B2C companies.
2.	**Hands on Practice on any one software**	1. Hoot suite 2. Racker RMS CRM. 3. Digital Marketing Boot Camp 4. Zest 5. Oktopost
3.	**Book Review (Any one)**	1. Tony Treacy (2021), How to Become a Master of Persuasion: Establishing Value and Convincing Your Customers of It, Business Expert Press 2. Paul Darley(2021), The Art of Relationship Sales, Smart Business Network 3. Scott Miller, (2021), Marketing Mess to Brand Success: 30 Challenges to Transform Your Organization's Brand (and Your Own)

Books Recommended:

1. George E. Belch & Michael A. Belch: Advertising & Promotions, An Integrated Marketing Communications Perspective, 12th Edition, Tata McGraw Hill, 2021.
2. Swapna Pradhan, Retailing Management, McGrall Hill India publication, 2020.
3. Tapan K. Panda and Sunil Sahadev, Sales and Distribution Management, Oxford University Press,2019.
4. Kevin Lane Keller, Vanitha Swaminathan, Strategic Brand Management. Building, Measuring and Managing Brand Equity, 5th Global Edition, Pearson Education, 2020.
5. Heidi Taylor, B2B Marketing Strategy: Differentiate, Develop and Deliver Lasting Customer Engagement, First Edition, Kogan Page, 2017.

Course Title
Human Resource Management (Group C)
Semester: III

Course Objectives:	1. To bridge the gap between theoretical knowledge and its application through a series of practical components in the form of mini-projects, book reviews and different HR software used by organizations. 2. To develop applied knowledge of Human Resource functions in any organization.
Learning Outcomes:	1. Gain hands-on-learning experience of different HR functions in organizations. 2. Develop skills to assess training needs and design training programmes in an Organizational setting. 3. Develop insight and competence in diagnostic and intervention processes and skills for initiating and facilitating change in organizations with regard to HR systems.

S. No.	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	M-330-TRAINING & DEVELOPMENT	
	Title/Activity	1. To plan, design, deliver, and evaluate an original training program/module for any organization of your choice. **Process:** 1. Each student will select their own topic for their training program/module. 2. Students shall conduct a needs assessment for their proposed training program. This should include both a person and a task analysis. Make clear in the write-ups what interview questions, questionnaires, etc. are used. 3. Based on the needs assessment and any assumptions students may need to make, develop specific training objectives. 4. Develop a detailed Training Proposal (Project Plan), which should include: a. Title and brief description of the program b. Training objectives c. Training methods to be used, and a rationale (justification) for using them, based on training theory d. Proposed instructors, and the reason for using them e. A tentative training outline/lesson

		plan f. A tentative list and description of training materials needed g. An evaluation plan (including both short- and long-term evaluation, where appropriate)
	M-331-STRATEGIC HUMAN RESOURCE MANAGEMENT	
	Title/Activity	1. (A) Assess the approach toward human resource management taken by any organization. What factors might you evaluate in determining whether an organization uses a traditional or strategic approach to managing its human resource? Develop specific questions that need to be answered and administer the questionnaire to the concerned HR authorities. (B) Select any local organization and investigate these factors by interviewing selected key decision–makers. 2. Visit any organization and interview HR and top managers to find out the following with regard to HR outsourcing- • Which HR activities have been outsourced by these firms? • Why these activities have been outsourced? • When these firms began to outsource? • Which HR activities have not been outsourced and why? • Which activities are likely to be outsourced in the near future? • The benefit that the firm has reaped by outsourcing, • The employee strength of HR department. The report is expected to highlight the trends in HR outsourcing and the rationale for those trends. The students are expected to learn about the importance of HR outsourcing in the current business environment.
	M-332-MANPOWER PLANNING	
	Title/Activity	1. Visit any two organizations preferably IT or BPOS and examine the employee referral policy as a source of recruitment. Highlight the advantages and disadvantages of the policy. 2. Identify and analyze the stages of planning human resource requirements in any organization of your choice.

	M-333-COMPENSATION MANAGEMENT	
	Title/Activity	1. Briefly interview an employee in his or her 20s, 30s, 40s, 50s and 60s. Determine what motivates employees from different generations and design compensation plans for each generation that would result in high performance. 2. Analyze the various employee benefits and reward schemes offered at the senior level management in any organization of your choice.
	M-334-HUMAN RESOURCE DEVELOPMENT	
	Title/Activity	1. Find the HR Climate and Systems used in 6 Indian Companies, analyse and identify the trends that may be observed in terms of HRD practices. 2. Identify any one successful merged company of your choice, collect data from employees regarding changes in HRD strategies pre and post merger.
2.	**Hands on Practice on any one software**	1. Orange HR 2. Fluida 3. Freshteam 4. Homebase 5. HRLocker
3.	**Book Review (Any one)**	1. HR from the Outside In: Six Competencies for the Future of Human Resources Dave Ulrich, Jon Younger, Wayne Brockbank, Mike Ulrich 2. HR Disrupted: It's Time for Something Different Lucy Adams 3. Belonging at Work: Everyday Actions You Can Take to Cultivate an Inclusive Organization Rhodes Perry, MPA

Books Recommended:

1. Noe, R. A., & Kodwani, A. D. (2019). Employee training and development, 7e. McGraw-Hill Education.
2. Mello, J. A. (2014). Strategic human resource management. Cengage Learning.
3. Dessler, G., & Varrkey, B. (2016). Human Resource Management, 15e. Pearson Education India.
4. Milkovich, G. T., Newman, J. M., & Milkovich, C. (2020). Compensation. McGraw-Hill.
5. Pareek, U., & Rao, T. V. (2015). Designing and managing human resource systems. Oxford and IBH publishing.

Course Title
Operations Management (Group D)
Semester III

Course Objectives:	1. To develop a practical outlook among students regarding manufacturing related concepts and tools. 2. To inculcate problem solving acumen among students for addressing problems related to the field of Industrial Production.
Learning Outcomes:	1. Students will be able to assess the requirements of productions related activities. 2. Students will be able to use and apply appropriate techniques to solve the issues related to operations management in Industrial Environment. 3. Students will be able to improve the effectiveness of various techniques by analyzing the outcome.

SN	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	M-340 -MATERIALS MANAGEMENT SOFTWARE	
	Title/Activity	1. Study and prepare a chart for Vendor selection procedure for any retail company(like Reliance Fresh) for supply of FMCG items. 2. Prepare formats of different documents used in stores, like bin card, Material issue note, material return note, item inspection report & item warrantee record.
	M-341 - TOTAL QUALITY MANAGEMENT	
	Title/Activity	1. Prepare a documentation and requirement report for ISO 9000 for any retail / manufacturing industry, already having ISO certification. 2. Prepare a report with parameters (for quality assurance in manufacturing process / raw materials) for a company suggesting necessary implementation of TQM approach with procedure indicating practical benefits.
	M-342-MANUFACTURING PLANNING AND CONTROL	
	Title/Activity	1. Prepare a maintenance budget and a report on equipment reliability maintenance procedure for plant production increased productivity. 2. Prepare a report on Flexible manufacturing system indicating the improvement process and benefits for any consumer product manufacturing unit like Refrigerator, washing machine, air conditioner etc.

	M-343-MANAGEMENT OF BPO ORGANIZATION	
	Title/Activity	1. Prepare a report for lost sales of a drinking water bottles manufacturing companyfor its quality improvement by six sigma approach and analyse problems byfishbone diagram. 2. Prepare a report for,how data are transferred and kept in privacy in a BPO firm.
	M-344-EXPORT, IMPORT PROCEDURES AND DOCUMENTATION	
	Title/Activity	1. Prepare a report from last 10 years data of India's export and import to determine the key products and areas of opportunity. 2. Prepare report on special precautions to be taken while exporting handicraft items or processed food grade items.
2.	**Hands on Practice on any one software**	Students must be given exposure to some of the following Softwares: 1. Enterprise WMS and Interchange EDI, 2. eBideXchange, 3. 3PL Warehouse Manager by 3PL Central, 4. S C expert, 5. FlexRFP
3.	**Book Review (Any one)**	1. Kiran, D. R. (2019). Production planning and control: A comprehensive approach. Butterworth-heinemann. 2. Everett, E. A., & Ebert, R. J. (2008). Production and Operations Management: concepts, models and behavior. Prentice-Hall of India.

Books Recommended:

1. Buffa, E. S. (2007). Modern production management. Wiley.
2. Arnold, J. T., & Chapman, S. N. (2004). Introduction to materials management. Pearson Education India.
3. Groover, M. P. (2016). Automation, production systems, and computer-integrated manufacturing. Pearson Education India.
4. Besterfield, D. H., Besterfield-Michna, C., Besterfield-Sacre, M., Besterfield, G. H., & Urdhwareshe, H. (2011). Total Quality Management: For Anna University. Pearson Education India.
5. Kulkarni, S. (2008). Business Process Outsourcing. Jaico.

Course Title
Information Technology Management (Group E)
Semester: III

Course Objectives:	1. To Explain and apply the core aspects of information technology principles and tools, and manage their implementation in a business context 2. To integrate complex IT projects and strategies with consideration of the human, financial and environmental factors and an understanding of risk management processes, and operational and policy implications.
Learning Outcomes:	1. Apply practical experience in IT projects for real world clients focusing on technology auditing and recommendations, and system development. 2. Utilize interpersonal skills to negotiate and communicate effectively with both technical and non-technical stakeholders verbally and in writing. 3. Design and document robust, extensible and highly maintainable data-intensive applications using cutting edge technologies tailored to the specific needs of any business scenario.

S.No.	Component	
1.	**Practical Component/ Field Based Assignments**	
	SOFTWARE ENGINEERING	
	Title/Activity	1. Develop a mini project for designing backend using software engineering techniques. Visit the company to understand the problem, study the existing system and present drawbacks of existing system and scope of the proposed system. Identify users of the system. Gather data requirements and functional requirements. Identify Entities and their Attributes and draw Entity Relationship Diagrams. Design the database for the system. 2. Teams play a very important role in developing any software project. Visit a company and find out number and types of teams working on software projects. Create an analytical report of a team that studies the team potential, effectiveness, commitment, function, and performance. Describe the types of projects, type of team for each, and role of each team member, prior performance record of the team, software and hardware used in projects, hierarchy of team management and communication medium, etc.

	E-BUSINESS	
	Title/Activity	1. In this project students are advised to study the internet architecture and infrastructure adopted by organization to sustain its e-Business. The infrastructure would include hardware, software, web-technologies and collaborative technologies. The project report must include a detailed description of the organizational infrastructure to support e-business. The students are also supposed to analyse the Mission and Vision statement of the organization and align it with recent e-Marketing strategies. The project report should also include the impact of e-Marketing over traditional marketing in terms of growth trends, cost benefits, client reach and return on investment. 2. Companies are selling their products and/or services globally. The major challenges that are faced by the organization are whether to standardize their product offerings or services or to customize their product offerings or services. This decision concerns companies commencing to market their products in the country as well as those already operating internationally and considering expanding into further markets. In this project the students are advised to study the contemporary issues faced by the organization for standardization. The project report should include e-Business risk, security concerns and impact of on-demand delivery of products or services during standardization.
	STRATEGIC MANAGEMENT OF INFORMATION TECHNOLOGY	
	Title/Activity	1. Choose an organization to design a long-term plan of action to achieve particular enterprise goals which are strongly related to environmental changes. Adopt a strategy to make the enterprise respond according to those changes. Explore information technology strategies with forecasting features as well as strategies for reducing uncertainty. Some of the following tools may be used for creating strategies: • Information technologies that support the strategy generation process. • Strategy modelling tools – current and ideal state modelling. • Scenario development and evaluation systems. • Strategy mapping tools. • Strategy visualization tools. • Tools for strategic business modeling. • Strategic forecasting technologies.

		2. Visit an organization of your area of interest to monitor the environment in the organization and register the recent changes that have taken in the industry/organization and its environment. Develop a strategy according to the industry and environmental changes. Measure and evaluate the effectiveness of the developed strategy and apply strategy re-engineering algorithms if needed. Following systems could be used accordingly: • Business performance measurement systems. • Strategic control systems. • Strategy evaluation and re-engineering systems.
	INFORMATION SECURITY AND CYBER LAW	
	Title/Activity	1. The students should visit corporate houses/BPOs and understand the mechanism of how cyber laws are enforced in India. They should also refer to case studies like that of BPO arm of MPhasiS Ltd who defrauded US customers of Citibank for Rs 1.5 crores for their reference. 2. The radio frequency identification (RFID) tags on credit or debit cards can be read as they are used by computers located at a short distance away and from a car lurking in a parking lot when you use your card at the ATM. This project might involve identifying the kinds of materials that will block an RFID reader and designing a solution to mask your cards' RFIDs. For this the students need to visit places like Amazon warehouse or any other warehouses, banks where RFID tagging is used.
2.	**Hands on Practice on any one software**	1. MS-Excel 2. CASE Tools 3. MS-Visio 4. Wix 5. Eclipse
3.	**Book Review (Any one)**	1. Information Security: Principles and Practice Hardcover – Import, 20 January 2022 2. by Mark Stamp, Publisher: Wiley; 3rd edition (20 January 2022), Hardcover: 448 pages 3. Working Backwards: Insights, Stories, and Secrets from Inside Amazon Paperback – 18 February 2021, by Colin Bryar, Bill Carr, Publisher: Macmillan (18 February 2021); Pan Macmillan UK, Paperback: 304 pages 4. Software Engineering at Google: Lessons Learned from Programming Over Time Paperback – 13 March 2020, by Titus Winters, Hyrum Wright, Tom Manshrek, Publisher: O'Reilly (13 March 2020), Paperback : 500 pages

Books Recommended:

1. Roger S Pressman, Bruce R Maxim, "Software Engineering: A Practitioner"s Approach", 8th Edition, 2019.
2. Dave Chaffey, e-Business & e-Commerce Management: Strategy, Implementation, Practice, Pearson Education, 5th Edition, 2013
3. Hanschke, Inge, "Strategic IT Management: A Toolkit for Enterprise Architecture Management", 1st edition, Springer publication, 2009.
4. William Stallings, "Cryptography and Network Security: Principles and Practice", 8th Edition, Pearson Education, 2018.

Course Title
Business Analytics (Group F)
Semester: III

Course Objectives:	1. Identify, model and solve decision problems in different settings and to critically apply the concepts and methods of business analytics. 2. Explain and apply the core aspects of information technology principles and tools, and manage their implementation in a business context.
Learning Outcomes:	1. Design, document and develop robust, extensible and highly maintainable data-intensive applications using cutting edge technologies tailored to the specific needs of any business scenario. 2. Understand and facilitate the strategic and operational benefits of business models and technology applications. 3. Manage complex IT projects with consideration of the human, financial and environmental factors and an understanding of risk management processes, and operational and policy implications.

S.No.	**Component**	
1.	**Practical Component/ Field Based Assignments**	
	DATA SCIENCE & ANALYTICS	
	Title/Activity	1. Students will collect data online or offline from an industry of any domain; identify the requirement for making recommendation system for selected domain. Use data mining algorithms for providing recommendations among different available options using clustering algorithms. For example students can try Movie recommendation. 2. Students will collect data from one company/ Industry. Identify the requirement and variables for **Exploratory Data Analysis.** Find potentially interesting, relevant patterns in the data through the creation of different graphs and plots that let you see relationships between different attributes of the dataset. For example, you can use tools histograms, bar graphs, scatter plots and find outlier in the given data.

	DATA WAREHOUSING & MINING	
	Title/Activity	1. In this project, Students may use customer level data of actual customer purchases offline and online to perform classification on data sets load each dataset into Weka and run classification algorithm. Study the classifier output. Extract if-then rules from the decision tree generated by the classifier, observe the confusion matrix. Load each dataset into Weka and perform Naïve-bayes classification and k-Nearest Neighbor classification. Interpret the results obtained and compare result. 2. Students will collect data from a company/ Industry. Identify the requirements and variables to perform clustering of data sets. Load each dataset into Weka and run simple k-means clustering algorithm with different values of k (number of desired clusters). Study the clusters formed. Observe the sum of squared errors and centroids, and derive insights. Explore visualization features of Weka to visualize the clusters. Derive interesting insights and explain and also explore other clustering techniques available in Weka.
	BIG DATA TECHNOLOGIES	
	Title/Activity	1. Visit any retail e-commerce office and collect data about customers' experiences, behavior, demand and operational efficiency between different channels i.e. Coordination between inventory department and the production unit. Analyze its demand prediction, optimize asset utilization using big data tools. 2. Tourism is a large sector that provides the livelihood for several people and can adversely impact the economy of a country. Collect the data from hotels, tour operators and create a project by analyzing the behavior based on decision making, perception, choice of destination and level of satisfaction using big data tools.

	BLOCKCHAIN TECHNOLOGIES	
	Title/Activity	1. Over a million documents are share over the internet every single hour. In this superfast world there are various ways to share documents easily and securely over the web. Also at the same time there is always a risk of document tampering. To solve these issues the students are supposed to visit corporates which deal in document apostille. This may include sender verification, receiver verification and document validation and then study a smart android based document sharing system over blockchain technology that ensures easy document sharing along with authenticity and reliability of a tamper proof system. 2. Tenders or contracts are generally used by companies to procure goods or services. Wrongful tender management leads to huge losses in case of faulty practices. This includes favouring of contractors, improper record maintenance, lack of transparency, hacking, data modification and other issues. To ensure the complete tender management process is secure and efficient the students are supposed to visit such companies, and then identify how the use of blockchain technology solves tender management issues.
2.	**Hands on Practice on any one software**	1. SPSS 2. R-programming Tools 3. Hadoop 4. MS-Excel 5. Data Melt
3.	**Book Review (Any one)**	1. The Real Business of Blockchain: How Leaders Can Create Value in a New Digital Age Hardcover – 20 November 2019 by David Furlonger (Author), Christophe Uzureau, Publisher: Harvard Business Review Press, 20 November 2019, Hardcover: 272 pages 2. Financial Services Revolution: How Blockchain is Transforming Money, Markets, and Banking (Blockchain Research Institute Enterprise) Hardcover – 5 February 2020, Publisher: Barlow Publishing, 5 February 2020, Hardcover: 408 pages 3. The Art of Statistics: Learning from Data (Pelican Books) Paperback – 27 February 2020 4. by David Spiegelhalter, Publisher: Pelican 27 February 2020, Paperback: 448 pages

Books Recommended:

1. Foster Provost & Tom Fawcett, " Data Science for Business", O' Reilly, 2013
2. Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Third Edition, Elsevier, 2012.
3. Arshdeep Bahga, Vijay Madisetti, "Big Data Analytics: A Hands-On Approach", VPT, 2018
4. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, " Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, 2016.

M-319 - Managerial Skills Development Lab

Course Objectives:	1. To provide exposure to the essential management skills that managers ought to possess to perform their duties efficiently. 2. To enable students to apply management concepts in their daily lives, assess current level of skill competence and knowledge and create corporate readiness.
Learning Outcomes:	1. Understanding the wide range of skills that management should possess to run an organization effectively and efficiently. 2. To make students ready to take on the responsibilities and contribute effectively towards the growth and development of a company. 3. Contribute towards holistic development of students so as to make them industry-ready managers.
Details of Lab Work	
Focusing on Interpersonal Communication	• Communication and the self-Management • Converting Challenges into Opportunities • Interpersonal Influence • Dealing with Resistance • Planning and Scheduling • Presentations
Teamwork Skills: Communicating Effectively in Groups	• Group development and decision making • Group conflict, difference, and diversity • Group communication and technology • Meeting Management
Career Success	• Effective Group Communication • Group Decision-Making • Group Conflicts
Time Management for Personal & Professional Productivity	• Identify Important Time Wasters • Techniques for Time Management • Significance of prioritizing • Work/life balance & Multi-tasking • Avoiding Procrastination of work
Leadership and Negotiation Skills	• Inspiring and Motivating Individuals • Managing Talent and Leading Team • Influence and Persuasion

	• Negotiation Skills • Negotiation Strategies and Styles
Practical Components/ Field Based Assignments	Select **any three** from the following and prepare a Report: 1. Watch one interview of any Business Personality of your choice, create a Power Point Presentation on same personality and include following heads: • Life story • Achievements • Challenges Faced • Your learnings 2. Interview ten executive who travel outstation frequently. Ask them to describe what problems they face in communication during these visits and how they deal with such issues? Make checklist of Strategies and tactics that can be used when you travel outstation for business works, to deal with communication issues. 3. Make a field trip to a rural area and observe how people communicate while conducting business transactions 4. Spend a day at a public place – Mall/ movie hall/ Heritage site and observe how people communicate through mobile phones? Do you find any difference in the behaviour based on gender, age or socio-economic variable? Which aspect of your observation would you like to change and why? 5. Your company kitchenmate which manufactures kitchen appliances has been awarded a prestigious quality award for both product design and Service Delivery. You are the CEO of the company you want to communicate this information to all the employees of the company, you would also like to use a personality to motivate the employees to continue with the good work. Write an inter-office memo with a suitable message. 6. Create a Power Point Presentation after taking the editorial pages of the last five days of any business newspaper. Go through the contents and organise your findings under the following heads: • Nature of subject matter (Current affairs, economics, etc.) • Target audience of the various columns • Presentation and organisation of contents • Gaps in information that need to be addressed

Book Review: (Any one)	• Darren Hardy (2021). The Compound Effect, Manjul Publishing House, Macmillan. • Greg McKeown, (2021). Essentialism: The Disciplined Pursuit of Less, Virgin Books. • Scott H. Young (2019).Ultralearning: Accelerate Your Career, Master Hard Skills and Outsmart the Competition, HarperCollins

Books Recommended:

1. Stephen. R. Covey (2015). The 7 Habits of Highly Effective People by Simon and Schuster India; 2011th edition
2. Brain Tracy(2018). Eat That Frog!: 21 Great Ways to Stop Procrastinating and Get More Done in Less Time, Berrett Koehler Publishers
3. Rachel DeAlto (2021). Relatable: How to Connect with Anyone, Anywhere

Evaluation Criteria for Managerial Skill Development Lab

<table>
<tr><th></th><th>Components</th><th>Marks</th><th>Total Marks</th></tr>
<tr><td rowspan="8">Internal Evaluation Criteria</td><td>Attendance</td><td>05</td><td rowspan="8">60</td></tr>
<tr><td>Class Participation and Interaction</td><td>05</td></tr>
<tr><td>Written Tests/ In-class Quiz</td><td>10</td></tr>
<tr><td colspan="2">External Evaluation: Evaluation Criteria of Report
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<tr><th>SN</th><th></th><th>Unsatisfactory</th><th>Satisfactory</th><th>Good</th><th>Excellent</th><th>Score</th></tr>
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<tr><td>1</td><td>Understanding of Objectives with topic</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Understanding of Reliance of topic</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Interpretation & Analysis</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Presentation</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>Query handling</td><td></td><td></td><td></td><td></td><td></td></tr>
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Finance (Group A)

S. No.	Subject Code	Subject Title
Semester III		
1.	M-310	Security Analysis & Portfolio Management
2.	M-311	International Financial Management
3.	M-312	Marketing of Financial Services
4.	M-313	Corporate Taxation
5.	M-314	Banking and Finance

M-310-SECURITY ANALYSIS & PORTFOLIO MANAGEMENT

OBJECTIVES

1. To provide an overview of Investment opportunities.
2. To explain the process of calculating Risk and returns of Individual Securities and Portfolio of securities.
3. To explain creation and management of portfolios and applicable theories.

LEARNING OUTCOMES

1. Understand and apply the concepts, principles and theories applicable to securities analysis and portfolio management.
2. Identify and evaluate corporate securities.
3. Analyze and identify opportunities in stock markets.
4. Analyze investment opportunities in fixed income securities

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Concept of Saving and Investment:** Concept and relation between savings and investment at macro level, Investment objectives and avenues, Factors affecting savings & investment in India.	**3**
UNIT II	**Investing in Securities Market**- Overview of primary and secondary market. Stock Market Indices- Nifty and SENSEX (calculation methods used), Concept, types and procedure of Public Issue equity & debentures, criteria to evaluate financial market securities.	**3**
UNIT III	**Risk & Return**: Concept of risk and return, Risk free return and risk premium, Measurement of risk & return in controlled , regulated and market economy.	**2**
UNIT IV	**Portfolio Management and Portfolio Analysis: Concept**, Elements and types of Portfolio Management, measurement of risk and return in stock and financial markets Theories of Portfolio Management- CAPM, Markowitz Theory of Portfolio Selection, Evaluation of portfolio using Sharpe Measure & Treynor Measure. Portfolio Management in India	**4**
UNIT V	**Investment in Fixed Income Securities** –Fundamentals of Bond, Risk factors in fixed Income Securities, Yield v/s return, Types of yield, Significance and understanding of Bond rating in Investment decision making, Overview Bond Portfolio Management Strategies.	**3**
UNIT VI	**Valuation of Equity**: Scope of return in from Equity Investing, Models of Equity Valuation – Comparable Approach, Dividend Discount Models, Discounted Cash Flow Valuation Models	**3**
UNIT VII	**Fundamental Analysis** – Concept, EIC Framework- Economic, Industry and Company. Inferences and Implication from Fundamental Analysis.	**3**

UNIT VIII	**Technical Analysis** -Concept, Types of Charts and formations in charts, Inferences of Charts. Application of Technical Analysis in India.	**3**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Computation of risk and return of individual securities and portfolio of securities
- Understanding Major Stock market indices in India
- EIC analysis of any 3 listed companies on Indian Stock Markets and prepare a report of it.
- Understand Technical charts of any two companies each of any 2 sectors of choice using real time data.
- Empirical validation of CAPM and Markowitz theory of any two sectors.

BOOKS RECOMMENDED

1. Prasanna Chandra Investment Analysis And Portfolio Management, Tata McGraw Hill ,2017.
2. Kevin, S., Security Analysis and portfolio Management, PHI Learning, 2015
3. P. Pandian Security analysis and Portfolio Management, Vikas Publishing, House, 2012
4. Fischer and Jordon, Security analysis and Portfolio Management, Pearson ,2018
5. Prasanna Chandra, Behavioural Finance, Tata McGraw Hill , Second Edition
6. Sharpe F William, Alexander J Gordon and Baily V Jeffery, Fundamentals of Investments, PHI Learning Private Ltd, 2017.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Finance, Wiley Online Library
2. The Review of Financial Studies, Oxford Academic
3. Journal of Financial Economics, Elsevier
4. Journal of financial and Quantitative analysis ,Cambridge University Press

M-311-INTERNATIONAL FINANCIAL MANAGEMENT

OBJECTIVES

1. To introduce international financial environment and its implications.
2. To understand and analyze the recent developments and trends in global financial markets and global foreign exchange mechanism.
3. To understand implications and trends of international finance for developing economy.

LEARNING OUTCOMES

1. Analyze information within the global financial environment of foreign exchange to solve problems and make informed decisions.
2. Recognize and calculate forward exchange rates given spot rates.
3. Demonstrate an integrative understanding of the foreign exchange market and the relationships between interest rates, spot and forward rates and expected inflation rates.
4. Describe how foreign exchange rate markets work and predict exchange rates using alternative methods.

Section- A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to International Financial Management:** Concept, Institutional framework in IFM. Recent trends and challenges in international Finance, Evolution of International Monetary System.	**2**
UNIT II	**Exchange rate regimes:** Different exchange rate regimes. Exchange rate mechanism. International PaymentsGateway, Exchange Risk Management – hedging	**2**
UNIT III	**International investment strategies:** FDI and portfolio investment. International Financing sources and cost of foreign Borrowings. Cross currency management.	**3**
UNIT IV	**Balance of payments:** Concept, items, types of transactions, types of accounts and significance of BOPs: Disequilibrium in BOPs: its types. Remedial measures for correcting disequilibrium in BOPs –**J curve effect.**	**3**
UNIT V	**International financial market instruments**: ADRs, GDRs, Foreign bonds, euro bonds, floating rate notes, Global bonds, convertible bonds, **short- and medium-term instruments** – Euro notes, euro commercial papers, medium term euro notes.	**4**
UNIT VI	**Foreign Exchange Rate:** Meaning, types and determinants of foreign exchange rate, Spot market and Forward Market. The Real Exchange Rate, Real Effective Exchange Rate (REER) Cross Rates.	**4**

UNIT VII	**Exchange Rate Determination:** The Purchasing Power parity (PPP) Theory, The absolute form and the relative form, The Fisher Effect (FE) Theory (open and closed proposition), Interest Rate parity Theory. The Balance of Payments Theory.	**3**
UNIT VIII	**Global Financial Markets**: Recent developments and Challenges. Global foreign Exchange Markets: characteristics & recent trends, Flow of International Currency and Role of Institutions.	**3**

Section B

At least one case study/problem from each unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Study practical implication of PPP Theory on exchange rate of any two countries with a time range of 10 years.
- Determine forward rate of Rupee-USD on the basis of spot rate using Interest Rate Parity Theory
- Determine direct and indirect quotes between two currencies.
- Conduct an empirical study of J-Curve effect of any country experiencing a BOP deficit.
- Formulate strategy for hedging currency using forward contracts.

BOOKS RECOMMENDED

1. P.G Apte, International Financial Management, McGraw-Hill Education, 8th edition, 2020.
2. Alan Sharpio, Paul Hanouna, Multinational Financial Management. John Wiley Publication. 11th Edition 2019.
3. Cheol Eun and Bruce Resnick and TuugiChuluun, International Financial Management, McGraw Hill, 9th Edition 2021.
4. S. Kevin, Fundamentals of International Financial Management, PHI, EEE, 2012.
5. Vyuptakesh Sharan, International Financial Management, PHI, EEE, Sixth Edition, 2012.
6. Levi Maurice D., International Finance, Routledge, fifth edition.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of International Financial Management & Accounting, Wiley.
2. Journal of International Money and Finance, Elsevier.
3. International Review of Financial Analysis, ScienceDirect.
4. International Finance, Wiley Online Library.

M-312 MARKETING OF FINANCIAL SERVICES

OBJECTIVES

1. To understand various financial services in Indian economy.
2. To evaluate marketing of financial services and strategies for suitability and appropriateness in meeting consumer needs.
3. To assess the impact of financial innovation, advances in technology, and changes in regulations on financial services.

LEARNING OUTCOMES

1. Knowledge of current structure of the Indian financial services sector.
2. Creation of financial services brands in competitive market.
3. Learning management techniques and problems including regulatory aspects of Merchant Banking, Factoring, Credit rating agency etc.
4. Evaluate and create strategies to promote financial products and services.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Financial services-** Concepts, Types of financial services ,Regulatory Framework of Financial Services in India.	**2**
UNIT II	**Banking Services**: Commercial. Development, Investment and International banking – issues, trends and challenges, Marketing of Banking Services and Insurance companies	**3**
UNIT III	**Marketing of Financial Services:** Marketing Mix of Financial Services, Financial Products development strategies, Analyzing Marketing Strategies adopted by selected Banks & other financial service providers , Ethical Issues in Marketing of Financial Services.	**3**
UNIT IV	**Branding in Financial Services Sector**: Target Marketing & Customer Retention, Significance of Financial Brands, Targeting and positioning strategies, Impact of Branding on customer perception towards financial service providers, creation of a financial brand.	**4**
UNIT V	**Merchant Banking**: Overview, Nature, functions, scope and regulation.	**2**
UNIT VI	**Credit Rating** Meaning, functions and benefits. Credit Rating Agencies in India- CRISIL, ICRA and CARE, Global Credit Rating Agencies- Moody's and Standard & Poor's, Major Factors considered while determining the rating profile of a Security. Credit Rating- Regulatory Framework in India, Credit Rating for Debentures and IPO Grading, Limitations of Rating	**3**

UNIT VII	**Lease financing:** Industry, Size and scope, evaluation of lease transaction, Factoring and Forfaiting. **Securitization**: Introduction, Mechanism and process of Securitization, Asset Reconstruction Companies, Participants in securitization and their role.	**3**
UNIT VIII	**Mutual Funds:** Introduction, Types of Mutual Fund Schemes- Functional Classification, Portfolio Classification, Investment Classification, Benefits of Mutual Funds, Managing Mutual Funds in India- The Sponsor, The Trustees, The Custodians, Asset Management Company.	**4**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Study of any merchant banker in appraisal of projects, designing capital structure and instruments.
- Study of financial evaluation of any mutual fund.
- Prepare a Financial Plan for a Person / Manager / Entrepreneur / Director / CEO of a Company / Bank / Insurance Agent, considering his / her current expense level, future needs of family, retirement age and contingency funds.
- Students can study the procedure for opening a Savings account and a Current Account.
- Students can study the Credit card and debit card procedure and account statements.

BOOKS RECOMMENDED

1. Khan M.Y., Financial Services, Tata McGraw Hill, 10th Edition
2. Avadhani, V. K., 2018. Marketing of Financial Services, 3rd Ed., Pearson Education, India, ISBN: 978935142261-7
3. Siddaiah, Financial Services, Pearson Education India, 1st Edition
4. Avadhani V.A. Marketing of Financial Services, Himalaya Publishing House, 2013
5. Pathak V. Bharati., Indian Financial System, Pearson Education, 5th Edition.
6. Padmalatha& Justin Paul, Management of Banking and financial services, Pearson Education, 4th Edition
7. Anthony Saunders & Marcia Millon Cornett, Financial Markets and Institutions, McGraw Hill, 6th Edition.
8. Rajesh Kothari , Financial Services in India-Concept and Application, Sage Publications, 2010

LIST OF JOURNALS/ PERIODICALS/ MAGAZINES/ NEWSPAPERS

1. Journal of Financial Services Research, Springer.
2. Journal of Financial Services Marketing, Palgrave, Macmillan.
3. Journal of Banking & Finance, Elsevier.
4. International Journal of Financial Services Management, Inderscience Publishers.

M-313-CORPORATE TAXATION

OBJECTIVES

1. To understand the various direct and indirect taxes and their implications
2. To equip students with the ability to apply corporate tax provisions and financial planning tools to corporate world.
3. To enable students to plan and compute the direct and indirect taxes.

LEARNING OUTCOMES

1. Analyzing tax provisions, financial planning & tax management in India
2. Providing necessary inputs to the students for handling real life business problems efficiently using appropriate concepts of taxation laws.
3. Assessing the recent developments in tax structure in India.
4. Understanding the compliance requirements related to GST, wealth tax, capital gains & taxation.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Taxation:** Meaning, Types, Principles of Direct and Indirect Taxation; Constitutional provisions related to Distribution of taxation powers between States and the Central Government Basic Concepts – Assesses, Assessment, Person, Assessment Year, Previous Year, Heads of Income, Exemption, Deductions, Rebate and Relief, Gross Total Income and Total Income.	**3**
UNIT II	**Computation of Tax**: Residential Status of Individual, HUF, Firm and Association of Persons, Company; Relationship between residential status and incidence of tax; 'Receipt of income' and 'Accrual of income'	**2**
UNIT III	**Tax Planning:** Tax Planning, Tax Evasion, Tax Avoidance and Tax management. Need and Importance of Corporate Tax Planning. Filing of Returns and Assessments, Advance Tax, TDS, TCS, Advance Rulings, Avoidance of Double Taxation	**3**
UNIT IV	**Tax planning with reference to Financial Management decisions:** Capital Structure of a company, Dividend policy and Bonus shares issue, specific Managerial decisions. Tax planning for Depreciation and Business Expenditure	**3**
UNIT V	**Capital Gain & Taxation:** Basis of charge, Capital asset and Transfer of capital asset, Cost of acquisition, Cost of improvement, Indexation, Simple Problems on Computation of Capital Gains in certain special cases	**4**

UNIT VI	**Treatment of Losses and Unabsorbed items:** Set Off and Carry Forward of Losses. Tax planning in the context of Merger, Amalgamation, Demerger and Employees Remuneration. Penalties and Prosecution, Appeals and Revisions	**4**
UNIT VII	**Wealth Tax:** Charge and scope, Assets – Deemed Assets and Exempted Assets; Valuation of Assets, Computation of Net Wealth.	**2**
UNIT VIII	**GST**: General framework of different Acts related to GST, Basic Concepts, Levy and Collection. Supply – Characteristics, Nature and Place of Supply; Time of Supply, Value of Supply Input Tax Credit, Reverse Charge Mechanism, Composition Scheme, Anti-profiteering Measures. Trends in Tax Management: Faceless, Use of Artificial Intelligence in Tax Management, Retrospective tax.	**3**

Section - B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Presentation should be assigned in the class to the students on any of the topic given in the syllabus.
- Students should conduct an interview with Tax Practioner or Chartered Accountant for gathering information over the challenges faced in filing tax returns and same should be presented in the class.
- Students should be asked to visit the website of Income Tax Department and an assignment should be prepared on information disclosed on the website and its practical application.
- Students should collect data by administering a questionnaire on 'Tax Planning Tools' availed by individual tax payers in India.
- Students should do - Computation of total income and tax for individual (Salary only), - Computation of service tax, Exercise duty and VAT, - Tax planning for individual & Corporate houses

BOOKS RECOMMENDED

1. Datey. V.S,Indirect-Taxes-Law-and-Practice, 42nd-Edition
2. Dr. Vinod K Singhania & Dr Monica Singhania, Corporate Tax Planning and Business tax Procedures, Taxmann Publication, Latest Edition
3. Girish Ahuja & Ravi Gupta, Direct Tax Laws & Practices, Bharat Law House, Latest Edition
4. Dr. Vinod K. Singhania &Dr. Monica Singhania, Corporate Tax Planning & Business Tax Procedures with Case Studies, 20th Edition.
5. Paolo M Panteghini, Corporate Taxation in a dynamic world, Springer, Latest Edition
6. Lakhotia, R. N., Corporate Tax Planning.

LIST OF JOURNALS/ PERIODICALS/ MAGAZINES/ NEWSPAPERS

1. Journal of International Accounting, Auditing and Taxation, Elsevier.
2. Journal of Taxation, Thomson Reuters.
3. Journal of Indian Taxation, Journal Press, India.
4. Journal of Accounting and Taxation, Academic Journals.

M-314 BANKING AND FINANCE

OBJECTIVES

1. Understanding fundamental concepts of banking.
2. Understanding the concept of Microfinance.
3. To know about changing trends in the banking sector.

LEARNING OUTCOMES

1. Apply concepts of basic banking in daily banking operations.
2. Using knowledge of banking securities and other products in building a strong customer base.
3. Apply knowledge of documentation procedure of banking in real working environment.
4. Using the concepts of microfinance to increase the base of financial inclusion.

Section- A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction**: meaning, evolution and types of banks. Role and functions of Banks: Regulatory provisions / enactments governing banks; Securities for Bank Advances: Different forms of securities and precautions taken by Banks in accepting these securities.	**3**
UNIT II	**Banker-Customer Relations-** KYC guidelines - Different deposit products - Mandate and Power of Attorney, Banker's Lien, right of set off - garnishee order, attachment order etc. Payment of collection of cheque - duties and responsibilities of paying and collecting banker - protection available to them under NI Act - Endorsements, forged instruments -bouncing of cheques and their implications.	**4**
UNIT III	**Documentation procedure in banking system**: Stamping of documents; Securities: different modes of charging, types of collaterals and their characteristics; Priority sector lending: targets, issues, problems; New products and services, Credit cards / Home loans /personal loans / consumer loans - Ancillary Services - Remittances, Safe Deposit Lockers.	**4**
UNIT IV	**Banking and Non-banking institutions** – Scheduled commercial banks, NBFCs, regional rural banks, reforms in the banking sector, priority sector lending, Cooperative banking – Urban cooperative banks, Rural cooperative banks, Central cooperative banks, Primary Agriculture Credit Societies	**4**
UNIT V	**Management of Non-performing Assets by Banks –** Introduction, Tools of managing NPAs, Risk management in Indian banks.	**2**

UNIT VI	**Microfinance –** Concept,Micro financial institutions, small finance banks, Micro credit, self-help groups, Rural credit and finance, financial inclusion, small finance banks.	**3**
UNIT VII	**Guarantees**: Contract of Guarantee and contract of indemnity, Guarantee as Banker's Security. Banker Customer Relationship; Contemporary Issues in Banking: NPA and Capital Adequacy in Indian Banks.	**2**
UNIT VIII	**E-Banking-** Core Banking, Electronic products, electronic payment system, Online Banking, Electronic fund transfer system: RTGS, NEFT & SWIFT etc; Information Technology: Current trends and global developments- Crypto Currency, Fintech, Financial Literacy, Alternate Financial Channels, Online Payment gateways.	**2**

Section B

At least one case study/problem from each unit. Question swill be case/inferences/application based.

PRACTICALCOMPONENT

- Study any bank's stamping process and document it.
- Study online banking portals of a private bank and a public sector bank and compare online services and features offered. Prepare a comparison report.
- Conduct a survey of 50 respondents of underprivileged class to assess impact of financial inclusion in their lives.
- Prepare a report on management of NPAs by public sector bank for past five years.
- Study and document risk management by a private sector bank and a public sector bank.

BOOKS RECOMMENDED

1. Principles & Practices of Banking - By Indian Institute of Banking & Finance - Macmillan Publication,2020.
2. Bharti V. Pathak, The Indian Financial System, Third Edition, Pearson, 2011.
3. K.P.M. Sundharam, PN Varshney, Banking Theory Law & Practice, Sultan Chand & Sons, New Delhi,2018.
4. Nigam, B.M.L., Banking Law and Practice, Konark Publishers, Delhi, 2019.
5. S.V. Vasudevan, Theory of Banking - S.Chand & Company Ltd., New Delhi, 2018.
6. M.Y. Khan, Indian Financial System, Tata McGraw Hill Education, 7th Edition, 2012.
7. Vasant C. Joshi, Managing Indian Banks- The Challenges Ahead, Sage Publications, 2009

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Banking and Finance, Elsevier.
2. Journal of Banking and Financial Technology, Springer.
3. Annals of Finance, Springer.
4. International Journal of Banking, Accounting and Finance, Inderscience Publishers.

Marketing (Group B)

S.No.	Subject Code	Subject Title
Semester III		
1.	M-320	Integrated Marketing Communication
2.	M-321	Retail Management
3.	M-322	Sales Distribution and Logistics Management
4.	M-323	Product & Brand Management
5.	M-324	Industrial Marketing

M-320-INTEGRATED MARKETING COMMUNICATION

OBJECTIVES

1. To acquaint students with essential concepts and techniques for developing and designing an effective Integrated Marketing Communication programme.
2. To understand how the communication process fits into and works with consumer behaviour, emphasising the consumer decision-making process.
3. To equip the students with various communication tools and their effectiveness to foster creative ideas for the development of effective marketing communication programme.

LEARNING OUTCOMES

1. Evaluating marketing research and applying these findings to develop competitive strategies and select the target audience(s) for the I.M.C. campaign plan.
2. Develop an integrated cross-media and creative message strategy and concept to reach the target audience and deliver the brand promise through an I.M.C. campaign.
3. Structure an integrated marketing communications campaign plan based on the application of marketing concepts, principles and practices within an organisation.
4. Measure and critically evaluate the communications effects and results of an I.M.C. campaign to determine its success.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Overview of marketing communication, Role of I.M.C. in marketing process, Factors affecting the marketing communication mix, Integrated Marketing Communication tools, Models of consumer responses.	**2**
UNIT II	**Advertising:** Objectives of Advertising, Role of Advertising in the Marketing Process, Types of Advertising, Advertising Planning, Source, Message and selection of advertising channel, factors, Communication response hierarchy-A.I.D.A. model, Hierarchy of effect model, Innovation adoption model, Information Processing Model.	**2**
UNIT III	**Advertising Budgeting and Advertising agency:** Advertising budgeting methods, Advertising Agency, functions and types, Departmentalization and remuneration, Criteria for selecting the agencies, client-agency relationship, DAGMAR approach for setting ad objectives.	**2**
UNIT IV	**Creative Strategy:** Creativity in advertising, Creative Process, Creative Strategy-Appeals and execution Styles, Advertising Copywriting, copy principles for print advertising and broadcast copy, Advertising art-Layout-Functions and Types.	**3**

UNIT V	**Media planning & Scheduling:** Overview of Media Planning, Establishing Media objectives, Evaluation of Media mix -print, Broadcast (T.V. & Radio), Cinema, Outdoor, Direct Mail and Social Media, Developing and Implementing Media strategies, Media Scheduling.	**3**
UNIT VI	**Sales-Promotion, Direct Marketing, Personal Selling:** Sales-promotion objectives, Consumer-oriented sales promotion tools, Trade-oriented sales promotion tools, Designing the sales promotion program. Direct Marketing objectives, benefits and elements. Personal Selling objectives, strategy and process.	**3**
UNIT VII	**Event Marketing & Public Relations**: Public Relations, Interactive Marketing, Key elements of Event and Sponsorships, Promotion and Pricing, Concepts of promotion and pricing in events. Public relations meaning, objectives, tools of public relations. Interactive Marketing and Social media Marketing -Meaning, Components.	**4**
UNIT VIII	**Monitoring, Evaluation and control**: Measuring the effectiveness of the Promotional Program Evaluating the social, ethical and economic aspects of advertising and promotion.	**5**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICALCOMPONENT

- Visit a retail chain and make a note of the sales promotion schemes used by the marketer. Then, explore retail outlets of other chains and find out the different sales promotion schemes used by other companies. Make a comparative analysis of the various common sales promotion schemes used and the differences between the same. Also, try to find out the broad sales promotion plans for various categories of products on offer in these retail chains.
- Visit an Advertising Agency in your location and study its major functions and departments. Also study any two of their recent advertising campaigns.
- Create a poster twitter advertisement for encouraging people to Quit smoking.
- Assume that you are the marketing communications manager for a brand of paper towels. Discuss how the low-involvement hierarchy could be of value in developing an advertising and promotion strategy for this brand.
- Watch at least five T.V.C.s pertaining to different products, aired on different channels and covering different days. Answer the following questions for each of them:
    - What was the central message? What is the benefit of using the product?
    - Was the opening shot grabbing? Why?
    - Was there enough attention given to the product, or did the story take over? Was the product visible enough in terms of time or proximity to the camera?

- Was the closing shot concluding? Did it show the product?
- Did the product leave an impact on you? Why? Justify your answer.

BOOKS RECOMMENDED

1. Belch, G. E., & Belch, M. A. (2021). An integrated marketing communications perspective. Advertising and Promotion, 12th Edition, Tata McGraw Hill.
2. Juska, J. M. (2021). Integrated marketing communication: advertising and promotion in a digital world. Routledge, 2nd edition.
3. Kumar, S. R. & Krishnamurthy (2020). Advertising, Brands and Consumer Behaviour: The Indian Context, Sage Publications Pvt. Ltd.
4. Clow, K. E. (2018). Integrated advertising, promotion, and marketing communications. Pearson Education India.
5. Shah, K., & D'Souza, A. (2016). Advertising & Promotions an I.M.C. Perspective. Tata McGraw Hill.
6. Jain, S. & Jethwaney, J (2012). Advertising Management, Oxford University Press India; 2nd edition.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Advertising Research, The Advertising Research Foundation
2. Journal of Advertising, Taylor & Francis.
3. Journal of Marketing Communications, Taylor & Francis.
4. Journal of Advertising, American Academy of Advertising.

M-321- RETAIL MANAGEMENT

OBJECTIVES

1. To familiarise students with the different approaches to the retail marketplace, learn a set of retail marketing principles, and feel more confident about the practical uses of retail marketing.
2. To provide an understanding of specific retail marketing concepts like store design, visual merchandising, retail location strategies, management of private labels.
3. To develop transferrable skills among the students for managing retail operations efficiently so that they could be ready to join the retail industry.

LEARNING OUTCOMES

1. To evaluate the contribution of retailers to the product value chain; consumer motivations, shopping behaviours, and decision processes for evaluating retail offering and purchasing merchandise and services.
2. The analyse the key components of retail strategy.
3. Analyze Retail Market and Financial Strategy including product pricing
4. Understand key drivers of retail supply chain and how to select a retail store operation, design and mangement.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Overview of Retailing:** Evolution of Indian Retail Industry, Importance of Retailing, Retail Organisation and Retail Formats.	2
UNIT II	**Research in Retailing and Retail Customer:** Retail Research – importance and scope, Shopping Behavior of retail customers. Retail Buying Process.	3
UNIT III	**Store Location and Merchandise Management:** Retail Store Location Strategies, Store Design and Layout, Visual Merchandising and Atmospherics, Types of Layouts, Visual Merchandising - Role of Visual Merchandise, Visual Merchandising, Techniques- idea-oriented presentation, style presentation, colour presentation, price lining, vertical merchandising, tonnage merchandising, fixtures. Exteriors, Interiors.	4
UNIT IV	**Marketing Strategies for Retailing:** Retail market Strategies, Retail Marketing-Mix Strategies, Retail Pricing strategies, Retail Promotion Mix.	3
UNIT V	**Managing Retail Business**: Customer relationship management, Overview of Human Resource Management in Retail Organisation and Retail.	4
UNIT VI	**Store Management:** Responsibilities of Store Manager, Problem at Retail Centers, Store Record and Accounting System–E.D.I. and barcoding, Material Handling in Stores.	3

UNIT VII	**Emergence of Organized Retailing**: Organized Retailing and Online Retailing in India, Retailing in rural India, FDI in retailing, Role of I.T. in retailing.	**3**
UNIT VIII	**Franchising:** Franchising in India, Types of Franchising Agreements, Strengths and Weaknesses of Franchising, Key Franchising Agreements in India.	**2**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICALCOMPONENT

- Interview a retail salesperson and write a brief report about what they like and dislike about their jobs, salary, store management, sales quotas, why they chose a sales career, and what it takes to succeed in the sales profession.
- Visit a Kirana store and a supermarket and compare the following: a) store arrangement b) Number of brands carried c) pricing policies (discount policy) d) service equality e) retail sales personnel behaviour.
- Visit any modern retail format (Department store, hypermarket, mall, etc.) and study operational dimensions of retailing, location strategies, pricing policy, visual merchandising and other facilities.
- Take a trip to a supermarket. Observe the number of private labels and assess the categories in which you think private labels might be successful and why?
- Study any one franchisee model in India like Domino's, McDonald's, Pizza hut, K.F.C. etc. and make a presentation in the class.

BOOKS RECOMMENDED

1. Pradhan, S. (2020). Retailing Management, Mc Graw Hill India publication.
2. Berman, B., Evans, B. , Chatterjee, P.(2018). Retail Management, Pearson Publication.
3. Gibson (2017). Retail Management, Pearson publication.
4. Seshanna, S. (2017). Retail Management, Mc Graw Hill India publication.
5. Chetan Bajaj, C., Tuli, R. & Srivastava,N. (2016). Retail Management, Oxford University Press.
6. Chaudhary , P. (2016). Retail Marketing in the Modern Age, Sage Publications Pvt. Ltd.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Retailing, Elsevier
2. Journal of Marketing American Marketing Association
3. International Journal of Retail & Distribution Management, Emerald Publishing
4. Journal of Business & Retail Management Research, Scimago Journals

M-322- SALES DISTRIBUTION AND LOGISTICS MANAGEMENT

OBJECTIVES

1. To familiarise students with the importance of gaining market access and coverage as well as providing customer services through proper design and management of sales force, marketing channels, physical distribution systems in the context of the Indian marketing environment.
2. To acquaint the student with the concepts of developing a sound sales and distribution policy and in organising and managing sales force and marketing channels.
3. To make the students aware of the key principles in designing, managing, evaluating, and modifying marketing channels and physical distribution system in the context of changing Indian marketing environment.

LEARNING OUTCOMES

1. Demonstrate an understanding of Sales & Distribution function and examine its role as an integral part of marketing function.
2. Ability to understand & appreciate the diverse variables affecting the sales & distribution function.
3. Interpretation of the tools and strategies necessary for designing, motivating and evaluating sales & distribution management systems.
4. Collaborate amongst the sales team and improve the Leadership, Teamwork and team's performance to maximise sales.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Sales Management, Process, Role of Sales Manager and Salesmanship, Process of Personal Selling. Buyer Seller Dyad.	**2**
UNITII	**Goal Setting:** Goal Setting Process in Sales Management, Analysing Market Demand and Sales Potential, Preparation of Sales Budget.	**4**
UNITIII	**Sales Strategies:** Formulating Selling Strategies, Designing Sales Territories and Sales Quota.	**4**
UNIT IV	**Sales Force Staffing:** Designing the Structure and Size of Sales Force, Recruitment, Selection and Training of Sales Force.	**3**
UNIT V	**Compensation & Evaluation of Sales Force:** Motivating the Sales Force, Training, Compensating the Sales Force and Evaluating the sales force performance.	**3**
UNIT VI	**Distribution Management:** Concept of Distribution Channel, Importance of a Channel, Types of Distribution channels.	**2**

UNIT VII	**Distribution Channel Management:** Channel Design and Planning, Managing Marketing Channels, Evaluation of Channel Performance.	**2**
UNIT VIII	**Physical Distribution Management:** Components of Physical Distribution-Transportation, Warehousing and Inventory Control System, Logistics Management and I.T. Applications.	**4**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICALCOMPONENT

- Interview a salesperson and write a brief report about what they like and dislike about their jobs, salary, travelling allowances and sales quotas.
- Identify any FMCG product and study how the Sales & Distribution activity operates in the market. To do this assignment, the groups will visit the local wholesale & retail markets where that product is sold; chart the complete flow backwards and forward as relevant for geographical area; study all elements affecting distribution.
- Identify a consumer durable company and map the company's sales structure and the sales force deployed to cover the markets, including details of their territorial alignment, beat plan, and reporting norms.
- Ask your friends if they would buy certain goods like groceries, vegetables, socks, mobile, pens etc., from the roadside vendor as against a regular shop. Group the products into low risk and high-risk ones. Does this buying behaviour also depend on the personality of the individual doing the buying? Or the one doing the selling?
- Students can make a presentation on any product or the services of their choice, covering selling strategies and one-day work exposure of merchandising in any big retail outlet of respective places where institute is operating.

BOOKS RECOMMENDED

1. Panda, T.K. & Sahadev, S. (2019). Sales and Distribution Management, Oxford University Press.
2. Malik, R. & Deshwal, R. (2019). Sales And Distribution Management, J.S.R. Publishing House.
3. Richard, R.S. & Cundiff, E.W. (2017). Sales and Distribution Management, Pearson India.
4. Havaldar K.K. & Cavale, V.M. (2017). Sales and Distribution Management, Mc Graw Hill Publication.
5. Mathur U. C, (2012). Sales And Distribution Management, New Age International (P) Ltd Publishers.
6. Venugopal, P. (2008). Sales and Distribution Management: An Indian Perspective, Sage Publications Pvt. Ltd.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Retail & Distribution Management, Emerald Publishing
2. Journal of Marketing, Sage Journals
3. Journal of Personal Selling and Sales Management, Scimago Journals
4. Journal of Purchasing and Supply Management, Elsevier.

M-323-PRODUCT & BRAND MANAGEMENT

OBJECTIVES

1. To equip the students with the various dimensions of product management such as new product development, product life cycle and product-line decisions.
2. To explore the various issues related to Brand Management and enhance the understanding and appreciation of this important intangible strategic asset.
3. To enhance understanding on decisions involved in building & managing brands and brand equity so that they are profitable to the company and satisfactorily address target customers' needs and wants.

LEARNING OUTCOMES

1. Develop the ability to apply concepts and theories to real-life product management.
2. Use the brand positioning framework to build a brand, keep it relevant, expand a brand internationally, and reposition a brand.
3. Use tools and models to identify, define, and measure brand equity.
4. Implement profitable brand strategies by building, measuring and managing brand equity.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Setting Product Strategy:** Marketing Mix and Product Strategy – Integrated Approach, Levels of a Product, Product Characteristics and Classifications, Product-Mix Decisions, Product-Line Analysis, Product-Mix Pricing, Packaging and Labeling Decisions.	**4**
UNIT II	**Introducing New Market Offerings and Managing Product Life Cycle:** Product Manager's role in organisation, Managing Product Life-Cycle- Concept and Marketing Strategies, Types of New Products, Management of New Product Development Process, The Consumer-Adoption Process.	**3**
UNIT III	**Brand Management:** Concept of a brand, Selecting Brand Elements, Advantages and disadvantages of Branding, Strategic Brand Management Process.	**2**
UNIT IV	**Brand Resonance and Brand Positioning:** Concept of Brand Positioning, Identifying Points-of-Difference and Points-of-Parity, Straddle Positioning, Brand Positioning Strategies, Defining and Designing Brand Mantras, Steps in building a strong Brand, The Brand Value Chain.	**2**
UNIT V	**Brand Identity, Image and Personality:** Brand Identity-concept and essence, designing brand identity - Kapferer's Brand Identity Prism, Aaker Brand Identity Framework, Brand Image Definition, Factors building Brand Image, Concept of Brand Personality, Dimensions of Brand Personality, Building Brand Personality.	**3**

UNIT VI	**Understanding Brand Equity and Brand Valuation:** Brand Equity – Definition and Significance, Sources of Brand Equity, Behaviour-based Brand Valuation Models-(Aaker's Brand Valuation Model, Keller's Model of Brand Valuation) Customer-Based Brand Equity, Young and Rubicam's Model of Brand Valuation, Composite Brand Valuation Models-Interbrand Valuation Model, Measuring brand equity-Cost Based Method, Price Based Method, Customer-based Method.	**3**
UNIT VII	**Managing Brands Over Time and over Geographic Boundaries:** Brand Extension- Meaning, Types, Need, Advantages & Disadvantages, Reinforcing and revitalising brands-Concept and strategies, Advantages and disadvantages of Global Marketing Programs, Global Brand Strategy.	**3**
UNIT VIII	**Emerging Trends in Brand Management:** Managing Brand Experience- Experiential Branding, Web Branding, Challenges for managing Digital Brands, Success Factors for Digital Branding.	**4**

Section B

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Make a list of ten of your favourite brands and evaluate reasons that have positively contributed towards their likeability.
- Visit a supermarket and assess the brand elements in various brands of soaps, chocolates, tea, biscuits and other products.
- Study your favourite brand and evaluate its brand revitalization strategies.
- Pick a multiproduct company and as completely as possible analyse its brand portfolio and brand extensions.
- Pick an FMCG brand, a consumer durable and a service brand and attempt to identify its sources of brand equity. Assess their level of brand awareness and the strength, favorability and uniqueness of their associations.
- Consider some FMCG and Consumer Durable companies like P&G, H.U.L., Dabur, Tata Motors, Samsung, etc. and analyse their brand-building strategies in Indian context.

BOOKS RECOMMENDED

1. Keller, K.L., Swaminathan, V., (2020). Strategic Brand Management. Building, Measuring and Managing Brand Equity, 5th Global Edition, Pearson Education.
2. Minsky, L., Geva, I., (2019). Global Brand Management: A Guide to Developing, Building & Managing an International Brand First Edition, Kogan Page.
3. Miller, D. (2018). Building a Story Brand: Clarify Your Message So Customers Will Listen, Harper Collins.
4. Lehmann, D., Russell W. (2017). Product Management, Fourth Edition, Mc Graw Hill Education.
5. Panda, T.K. (2016). Product and Brand Management, Oxford University Press, First Edition.
6. Dutta, K. (2012). Brand Management- Principles and Practices, First Edition, Oxford University Press.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Product & Brand Management, Emerald Publishing.
2. Journal of Product Innovation Management, Wiley-Blackwell Publishing
3. Journal of Marketing, SAGE Publications.
4. Journal of Brand Management, Palgrave Macmillan

M-324- INDUSTRIAL MARKETING

OBJECTIVES

1. To bring out the distinctive aspects of Industrial Marketing and the need for a B2B paradigm.
2. To explain how business firms are to be understood as customers and the significant differences in segmentation bases between the business market and consumer market.
3. To give exposure to the various tools, techniques, and procedures appropriate for Industrial Marketing.

LEARNING OUTCOMES

1. Understand the differences between B2C and B2B marketing.
2. Critically approach marketing problems from an inter-organisational perspective and learn about decision making at buying centers.
3. Evaluate different purchasing strategies and be familiar with different methods of evaluation of suppliers and tenders.
4. Develop skills to understand the unique needs of business customers and succeed in marketing and management roles within B2B businesses.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Dimensions of Industrial Marketing:** Meaning and Scope of Industrial Marketing, Characteristics of Industrial Marketing, Comparison between Business and Consumer Marketing, Economics of Industrial Marketing demand – The Resellers Market – The Industrial Marketing Concept, Types of Industrial Markets, Classifying Industrial Products, Organizational Procurement System Characteristics.	**3**
UNIT II	**Industrial Buying and Buying Behaviour:** Factors affecting industrial buying decisions, Industrial Buying Behavior, Buying centre Process and factors, roles in buying process, structural dimensions, individual factors, Buying objectives, Business Buying process.	**3**
UNIT III	**Market Segmentation, Targeting and Positioning:** Market Segmentation, requirements for effective segmentation, benefits of market segmentation, segmentation variables, Market Targeting, Differentiation, Positioning Strategies.	**2**
UNIT IV	**Formulating Product & Service Strategy:** Developing Product Strategy, Analysing Industrial Product Life Cycle, New Product Development, Business Service Marketing: Characteristics, Service Marketing mix, Service marketing strategy.	**2**
UNIT V	**Formulating Channel Strategy:** Industrial Distributor, Types of Distribution, Channel Systems, factors influencing Channel design, Channel Logistics-	**4**

	Components of Logistics, Significance of Logistics, B2B logistical services, Supply Chain Management.	
UNIT VI	**Pricing Strategies:** Characteristics of industrial prices, factors affecting Pricing Decisions, pricing objectives, methods, Pricing Strategies, Competitive Bidding, Leasing.	**3**
UNIT VII	**Industrial Marketing Communication:** Communication Mix, Major decisions in Industrial Marketing Communication, Advertising in Industrial Markets, Message Formulation, policies, media, budgetary support, evaluation of advertising, sales Promotion in Industrial Markets, trade shows and exhibitions, Managing the Industrial Sales Force, Personal Selling Process.	**4**
UNIT VIII	**Recent trends in Industrial Marketing:** Partnering/ Relationship Marketing**,** Account-based Marketing, A.I. Powered Marketing, Digital Marketing.	**3**

SectionB

At Least one Case Study from each Unit. Questions will be case/inferences/application based.

PRACTICAL COMPONENT

- Conduct one week of Industry survey in the context of Industrial marketing by visiting minimum four companies. The data collected can be analysed using appropriate statistical software and report the findings.
- Choose two B2B firms and carefully study their Product Development Strategies and prepare a Power-point Presentation on the same.
- Select one B2B and one B2C firm and carefully compare their Supply Chain Strategy.
- Write a Five-page hand-written assignment on 'Industrial Marketing Performance Measurement'.
- Students may discuss the business needs to develop a marketing strategy, formulate a marketing plan and identify and discuss the elements of a business strategy.
- Visit any business unit and understand the various philosophies which influence buyers purchase decision actions. Then, discuss these purchase philosophies and how each affects the types of relationships in which a company can engage.

BOOKS RECOMMENDED

1. Taylor, H. (2017). B2B Marketing Strategy: Differentiate, Develop and Deliver Lasting Customer Engagement, First Edition, Kogan Page.
2. Brennan, R., Canning , L. E. & McDowell, R. (2017). Business-to-Business Marketing, 3e, Sage Publications Pvt. Ltd.
3. Sharma, D., Hutt M.D. & Thomas W.S. (2014). B2B Marketing: A South-Asian Perspective, Eleventh Edition, Cengage Publishing.
4. Vitale, R. Pfoertsch, W. Joseph Giglierano, J. (2011). Business to Business Marketing, 1st edition, Pearson.
5. Brennan, R., Canning, L., McDowell, R. (2011). Business-to-Business Marketing, Sage Publications.

6. Zimmerman, A. Blythe, J. (2013). Business to Business Marketing Management: A Global Perspective, Second Edition, Routledge.
7. Reeder,R.R., Brierty,E.G. Reeder, B.H. (2004). Industrial Marketing Analysis, Planning & Control, Prentice Hall of India.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Business-to-Business Marketing, Routledge Publications.
2. International Journal of Industrial Organization, Elsevier Publication.
3. Journal of Business & Industrial Marketing, Emerald Publishing.
4. Industrial Marketing Management, Elsevier Publication

Human Resource Management Group C

S.No.	Subject Code	Subject Title
Semester III - Electives		
1	M-330	Training & Development
2	M-331	Strategic Human Resource Management
3	M-332	Manpower Planning
4	M-333	Compensation Management
5	M-334	Human Resource Development

M-330: TRAINING & DEVELOPMENT

Objectives

1. To facilitate understanding of the role, importance and place of training in organizations as well as the approach to adult learning.
2. To assist students in understanding the processes of change in organizations and implement various behavioural science principles and practices.
3. To make students learn to apply OD interventions leading towards the goal of effective organization development.

Learning Outcomes

1. Students will develop understanding regarding training programs and processes in different organizations and analyze their effectiveness.
2. Students will learn to design a training program for a specific job role.
3. Students will be able to conduct a mock training session including need identification.
4. Students will learn to evaluate the effectiveness of the training Session.

SectionA

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Employee Learning and Development in Organizations:** Learning - the forces influencing working & learning, classification of learned capabilities, learning theories, the basic principles of learning, the learning process, mental & physical processes, the learning cycle, age influences on learning.	3
UNIT II	**Training:** Introduction, concept, meaning, designing effective training, training practices, strategic training, training needs assessment. Transfer of Training: implementation of the training programme.	2
UNIT III	**Training Methods:** Traditional training methods: presentation methods, hands-on methods, group building methods. Choosing training methods, E-learning & use of technology in training, developing effective online learning, blended learning, simulations, mobile technology & training methods, systems for training delivery.	4
UNIT IV	**Evaluation of Training & Employee development:** Reasons for evaluating training, overview of the evaluation process, evaluation practices, evaluation designs, threats to validity, considerations in choosing evaluation designs, determining ROI, determining costs, measuring human capital & training activity. **Employee Development**: Introduction, approaches to employee development, the development planning process, company strategies for providing development, special	5

	issues in training & employee development.	
UNIT V	**Introduction to OD:** Definition, Introduction & Foundations of Organizational Development, Characteristics of OD, Participation & Empowerment, Teams & Teamwork, Parallel learning structures.	**2**
UNIT VI	**OD Components:** Components of OD process-Diagnosis-Diagnosing the system, its subunits & processes, Programme Management Component, Third Wave Consulting: The Action component: nature of OD intervention, analysing discrepancies.	**3**
UNIT VII	**OD Interventions:** Definition, factors to be considered, choosing & sequencing intervention activities, classification of interventions: individual (coaching, counseling, training, behavioral modeling & mentoring),group (conflict management, group facilitation, group learning, self-directed work teams, team building & virtual teams).	**3**
UNIT VIII	**Future Trends in OD:** Restructuring organizations, OD in global settings, future direction in OD.	**2**

Section B

At Least one Case Study from each UNIT. Questions will be case/inferences/ application based.

PRACTICAL COMPONENT

- Prepare skill matrix for few selected jobs and identify the types of training needed to impart those skills.
- Case studies/role plays to understand how these methodologies can be effectively used for training.
- Conduct a mock training session including need identification on a set of students to evaluate the effectiveness of the same.
- Administer training need analysis case and ask the students to find out the training needs.
- Organize a training program.
- Make a Presentation on-the-job training techniques adopted by any organization.

BOOKS RECOMMENDED

1. Raymond A Noe, Amitabh Deo Kodwani, Employee Training and Development, McGraw Hill, 7e, 2019.
2. Jean Barbazette – Training Needs Assessment: Methods, Tools, and Techniques-Wiley, 2014.
3. Rolf Lynton, Uday Pareek, Training for Development, Sage, 2012.
4. P. Nick Blanchard, James W. Thacker, A. Anand Ram, Effective Training, 4e, Pearson, 2012.
5. Holbeche Linda, Judge-Cheung Yam-Mee, Organizational Development: A Practioner's Guide for OD and HR, Kogan Page, 2011
6. Steve W.J. Kozlowski, Eduardo Salas, Learning, Training, and Development in Organizations, Routledge, 2010.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Training and Development, Wiley-Blackwell Publishing Ltd.
2. European Journal of Training and Development, Emerald Group Publishing Ltd.
3. Training and Development Journal, Indianjournals.com
4. International Journal of Human Resource Development and Management, Inderscience Publishers

M-331: STRATEGIC HUMAN RESOURCE MANAGEMENT

OBJECTIVES	1. To develop a thorough understanding of the perspective of strategic human resource management. 2. Develop an understanding of aligning HR systems with business strategy and the concept of strategy formulation. 3. Develop an insight into the strategies for performance and development with knowledge of global economy factors.
LEARNING OUTCOMES	1. Distinguish the strategic approach to human resources from the traditional functional approach. 2. Understand the relationship of HR strategy with overall corporate strategy. 3. Understand the strategic role of specific HR systems. 4. Appreciate SHRM in the context of changing forms of organization.

Section A		
UNIT	**COURSE DESCRIPTION**	**SESSIONS**
Unit I	**Understanding Strategic HRM:** HR as Assets, The VRIO Framework, Factors determining the Investment Perspective of an Organization, Strategic HR vs Traditional HR, Ulrich Framework, Leepak and Snell Employment Models.	**3**
Unit II	**Link between HR strategy and Business Strategy:** Strategic Fit: A conceptual Framework, Best Fit Approach, Configurationally Approach, Best Practice Approach.	**3**
Unit III	**Workforce Utilization and Employment Practices:** Efficient utilization of human resource – cross training and flexible work assignment -work teams – non unionization, Dealing with employee shortages, Selection of Employees, Dealing with employee surpluses.	**4**
Unit IV	**Human Resource Evaluation:** Definition, Overview-Scope, Strategic Impact, Level of Analysis, Criteria, Level of Constituents, Ethical Dimensions.	**4**
Unit V	**Approaches to Evaluation:** Audit Approach, Analytical Approach, Quantitative and Qualitative Measures, Outcome and Process Criteria, Balanced Scorecard, HR Scorecard, Benchmarking.	**3**
Unit VI	**HRM and Firm performance:** Evolving role of HRM and its Measurement, Measures of HRM performance.	**3**
Unit VII	**Strategies for performance and development:** Typology of performance types – marginal performers – under achievers-stars-solid citizens, recruitment and	**2**

	selection strategy typology, Business strategy and compensation.	
Unit VIII	**The Future of SHRM:** SHRM practice in the future. Barriers to Strategic HR, Restructuring and SHRM, Competencies of HR Professional in a SHRM Scenario.	**2**

Section B

At Least one Case Study from each UNIT. Questions will becase/inferences/application based.

PRACTICALCOMPONENT

- Identify and enact the key roles assumed by HR in the context of a strategic human resource management approach.
- Demonstrate the interventions needed to generate commitment among key stakeholders and business partners for a strategic HR agenda.
- Role plays on HR taking a seat on strategic table.
- Role plays on handling underachievers.
- Strategic approach to use Golden Handshake with live company experiences
- Strategic approach to handle retrenchment with live company experiences

BOOKS RECOMMENDED

1. Rees, G., & Smith, P. (Eds.). (2021). *Strategic human resource management: An international perspective*. Sage.
2. Jeffrey A Mello, Strategic Human Resource Management, Cengage Learning India Pvt. Ltd. 2019
3. Tanuja Agarwala, Strategic Human Resource Management, 6th Edition, 2009, Oxford University Press.
4. Bohlander, Snell & Sherman, Managing Human Resources, 2012
5. Pearce & Robinson, Strategic Management: Formulation, Implementation & Control, 12th Edition, 2010, Mc Graw Hill
6. Noe, Hollenbeck, Gerhart, Wright-IRWIN, Human Resources Management Gaining a competitive advantage, 6th Edition, 2007

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Strategic Human Resource Management (JSHRM), Publishing India Group
2. The International Journal of Human Resource Management, Taylor & Francis (Routledge)
3. Academy of Management Journal, Academy of Management (United States)
4. Asian Journal of Management Cases, Sage Publications

M-332: MANPOWER PLANNING

OBJECTIVES

1. To understand the purpose, process and applications of human resource planning in the context of different organizational strategies.
2. To create practical awareness about the current trends in human resource planning in global companies.
3. To understand and explore the operational issues involved in recruitment and selection.

LEARNING OUTCOMES

1. Develop ability to apply knowledge of human resource planning and implement techniques of job design.
2. Develop competency to recruit, train, and appraise the performance of employees and handle employee issues.
3. Demonstrate ability to create a critical appreciation and knowledge of understanding the determinants of human resource requirements and the means for meeting those requirements.
4. Demonstrate ability to undertake full and fair recruitment and selection systematically.

Section-A

UNIT	Course Description	SESSIONS
UNIT I	**Introduction:** Definition and concept of HRP, Macro Level Manpower Planning and Labor Market Analysis - Organizational Human Resource Planning.	**2**
UNIT II	**Strategic Staffing:** HR planning as a strategic process employees as resources for goal attainment, linking HR process to strategy, involvement in strategic planning process, strategic HR Planning model.	**2**
UNIT III	**HR Planning:** HR planning process-Job analysis: meaning and definition, job analysis process, techniques of job analysis, methods and practice of job analysis, competency based approach.	**4**
UNIT IV	**Competency Mapping:** Competency mapping- procedures and steps, methods of data collection for mapping, developing competency models from raw data.	**2**
UNIT V	**Recruitment & Recruitment Techniques: Nature of hiring:** regular, temporary, Internal Hiring: meaning & definition of internal recruitment. Sources of internal recruitment: circulars, intranet, employee referrals. Appointment or promotion. External hiring: meaning & definition of external recruitment, sources of external recruitment. Scouting, re-recruitment, event recruitment, online recruitment, social recruitment & mobile phone recruitment; recruitment process outsourcing, head hunting, Job advertisement: drafting, size & contents.	**4**

UNIT VI	**Employment Tests and Interviewing:** Concepts of Testing, Types of tests, use of psychological tests, Interviewing: planning the interview, interview process: preparation, 4 80 components, types, interviewing behavior & skills, structuring of interview, using the interview checklist.	**4**
UNIT VII	**Selection:** Meaning and Significance of Selection, Selection process. Evaluation of Selection System, Errors in selection. Employer branding.	**3**
UNIT VIII	**Career Planning & Succession Planning:** Introduction, Roles, Managing Career Planning, Elements of a Career Planning Programme, Career Development and Succession Planning – Concept & Process.	**3**

SectionB

At least one Case study from each UNIT. Questions will be case/ inferences/ application based.

PRACTICALCOMPONENT

- Students should identify various sources of recruitment used by Indian organizations for lower, middle level and top level management jobs.
- Mock interviews should be conducted by students.
- Identify three to four jobs generally known to most of the students and ask them to collect the data and prepare job description and job specification for the said jobs.
- Students are expected to draft job advertisements.
- Obtain online access to the resume database of job portals for a week and give at least four job descriptions and specifications to each student, to search and download from the data base at least five resumes for each position.

BOOKS RECOMMENDED

1. Picardi, C. A. (2019). *Recruitment and Selection: Strategies for Workforce Planning & Assessment*. SAGE Publications.
2. Dessler Gary; Varkkey Biju, (2016). Human Resource Management, 14th edition, Pearson India Education Services Pvt. Ltd.
3. Sekhri Arun, (2016). Human Resource Planning And Audit, Himalaya Publishing House.
4. Picardi, C. A. (2019). *Recruitment and Selection: Strategies for Workforce Planning & Assessment*. SAGE Publications.
5. Laroche Lionel, Rutherford Don, (2013). Recruiting, Retaining and Promoting Culturally Different Employees, Elsevier, USA.
6. Meara O' Bernard, Petzall Stanely, (2013). The Handbook of Strategic Recruitment & Selection, Emrald, UK.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. The International Journal of Human Resource Management, Taylor & Francis (Routledge)
2. Human Capital, People Trends Pvt. Ltd.
3. HRM Review, Elsevier Ltd.
4. Journal of Business and Management (IOSRJBM), International Organization of Scientific Research (IOSR)
5. Human Resource Management Journal, Wiley Online Library

M-333: COMPENSATION MANAGEMENT

OBJECTIVES	1. To impart knowledge in the design, implementation and administration of compensation and benefits in the organizations, taking into account the legal provisions. 2. To leverage compensation in creating a high performing organization. 3. Facilitate the student in performing the role of a contemporary compensation manager by gaining insights into current practices of compensation in Indian organizations.
LEARNING OUTCOMES	4. Recognize how pay decisions help the organization achieve a competitive advantage. 5. Analyze, integrate, and apply the knowledge to solve compensation related problems in organizations. 6. Demonstrate comprehension by constructing a compensation system encompassing: 1) internal consistency, 2) external competitiveness 3) employee contributions, 4) organizational benefit systems and administration issues. 7. Design rational and contemporary compensation systems in modern organizations.

Section A		
UNIT	**COURSE DESCRIPTION**	**SESSIONS**
UNIT I	**Compensation management:** An Introduction: Compensation Management, Compensation and Non-compensation Dimensions, 3-P Concept in Compensation Management, Compensation as Retention Strategy, Compensation for Special Groups, Significant Compensation Issues.	**3**
UNIT II	**Job Evaluation, Grading and Compensation Structure:** Concept of Salary Structure, Salary Progression, Methods of Payment, Limitations of Job Related Compensation, Competency based Compensation (Broad pay bands and 360 degree feedback).	**2**
UNIT III	**Wages and Salary Administration at Macro (National) Level:** Wage Concept, Wage Policy, Institutional Mechanisms for Wage Determination, Pay Commission, Wage Boards, Public Sector Pay Revision, ILO and Collective Bargaining, Union Role in Wage and Salary Administration.	**4**
UNIT IV	**Job Evaluation:** Compensation Strategy at Micro Level, Concept of Equity, Job Evaluation - Methods of job evaluation and System of job evaluation, Process of Job Evaluation, Problems Involved in Job Evaluation.	**2**

UNIT V	**Incentive Schemes:** Types of Incentive Schemes, Wage Incentive Plans, Pre-requisites of Effective Incentive Schemes, Merits and Demerits of Incentives, Pay for Performance Plans.	**3**
UNIT VI	**Benefits and Services:** Concept and Nature of Benefits, Classification of Employee Benefits, Employee Benefit Programs, Long term Incentive Plans, Strategic Perspectives on Benefits, Factors Influencing Choice of Benefit Program, Administration of Benefits and Services, Employee Services – Designing a Benefit Package.	**4**
UNIT VII	**Managerial Remuneration:** Managerial Remuneration – Concept and Elements, Executive Compensation: Methodology, CEO-to-worker pay ratio, Performance Linked Compensation; Balancing of Internal and External Equity.	**2**
UNIT VIII	**Rewards & Recognition:** Concept of Reward Management, Developing Reward Policies, Reward Strategy, Developing Total Reward Approach, Reward Management in Service Sector, Total Reward Framework of Service Industry in India, Factors affecting Reward Management Policies in Service Sector, Process of Designing a Successful Reward Strategy.	**4**

Section B

At Least one Case Study from each UNIT. Questions will be case/ inferences/ application based.

PRACTICALCOMPONENT

- Students have to prepare questionnaire for conducting wage survey and carry out wage survey for any selected sector and prepare a report for the same
- Students are expected to conduct a survey regarding the effective utilization of resources within the campus and find out the flaws in the existing compensation system.
- Give a wage determination case and ask the students to suggest solution.
- Give a cost to company case and ask the students to role play for negotiating with a prospective job applicant to distribute the CTC under various components.
- Give a case to identify and prepare the notices to be displayed, returns to be submitted and the registers to be maintained as per the above legislations.

BOOKS RECOMMENDED

1. Newman, Jerry M., Gerhart Barry, Milkovich, George T. (2020). Compensation, McGraw Hill.
2. Sharma, R. C., Sharma Sulabh, (2019). Compensation Management, Sage Publications Inc.
3. Singh, B. D. (2012). Compensation and Reward Management. India: Excel Books.
4. Compensation Management, Bhattacharya (2009). India: Excel Books.
5. Macky, K. A., Wilson, M. G. (2013). Rewards, Remuneration and Performance: A Strategic Approach. New Zealand: CCH New Zealand Limited.
6. Murlis, H., Armstrong, M. (2007). Reward Management: A Handbook of Remuneration Strategy and Practice. United Kingdom: Kogan Page.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Compensation and Benefits, Sage Publications
2. Journal of Economic Perspectives, American Economic Association (United States)
3. The Journal of Total Rewards, World at Work
4. Compensation & Benefits Review, Sage Publishing

M-334: HUMAN RESOURCE DEVELOPMENT

OBJECTIVES

1. This course is designed to help students in understanding various concepts of HRD, HRD systems and processes.
2. It will enable students in developing HRD facilitator's skills.
3. This course will help students to develop and design HRD programmes and implement and control them in various organizational setups.

LEARNING OUTCOMES

1. Ability to describe the role of Human Resource Development Function in an Organization.
2. Ability to enumerate the emerging trends and practices in HRD.
3. Demonstrate the use of different tools and techniques of HRD in an Organization.
4. Evaluate the developing role of human resources in the global arena.

SectionA

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**HRD- Macro Perspective:** Introduction to Human Resource Development- Concept, Relationship between human resource management and human resource development, HRD mechanisms, processes and outcomes.	**3**
UNIT II	**HRD- Micro Perspective:** HRD matrix, HRD interventions, Roles and Competencies of HRD professionals, Challenges in HRD.	**2**
UNIT III	**HRD Process:** Assessing need for HRD, Designing and developing effective HRD programs, Implementing HRD programs, Evaluating effectiveness of HRD Programs, HRD audit, HRD culture and climate.	**3**
UNIT IV	**Introduction to HRD Tools:** Need, scope and design of the HRD tools, Foundations of HRD Tools- Organizational Psychology concepts-Individual, Group and Organizational processes affecting performance.	**3**
UNIT V	**HRD Activities:** Employee development activities- Approaches to employee development, leadership development, action learning, assessment and development centres, Intellectual capital and HRD, HRD mechanisms for workers, Role of trade unions, Industrial relations and HRD, Influence of motivation on development activities.	**3**
UNIT VI	**Evaluating HRD Programs:** Purpose of HRD Evaluation, Models and frameworks of evaluation, Assessing impact of HRD Programs, Ethical issues concerning Evaluation.	**2**
UNIT VII	**HRD Applications and Trends:** Coaching and mentoring, Career management and development, Employee	**4**

counselling, Competency mapping, PCMM, Balanced Score Card, Appreciative inquiry, Integrating HRD with technology, Employer branding and other emerging trends.

UNIT VIII **HRD in Organisations:** Selected cases covering HRD practices in government organisations, manufacturing and service industries and MNCs, International experiences of human resource development. **4**

SectionB

AtLeastoneCaseStudyfromeach UNIT.Questionswillbecase/inferences/ applicationbased.

PRACTICAL COMPONENT

- Designing HRD Programmes for employees of different sectors.
- Case Study and role play on selecting training methods for the employees of different sectors and departments
- Diagnose and analyze the HR process of organizations and its aims.
- Formalize, design and evaluate various recruitment and placement policies.
- Develop ways in which human resource management might formulate a business strategy and then facilitate the internal change necessary to accomplish the strategy.

BOOKS RECOMMENDED

1. Udai Pareekh & T.V.Rao, Designing and managing Human Resource Systems, Oxford, 2015.
2. John Werner and Randy Desimone, Human Resources Development, Cengage, 2011.
3. Haldar, U. K., Human resource development, Oxford University Press India, 2009.
4. Rao, T.V., HRD Score Card 2500: Based on HRD audit, Response Books, SAGE Publications, 2008.
5. Noe, Raymond.A, Employee Training & Development, McGraw-Hill, 2018.
6. Mathur, Sumit Kishore & Mathur, Jyoti, HRD Climate: A Review, 2020.

LISTOFJOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Human Resource Development Review, Sage Publications
2. The International Journal of HRD Practice, Policy & Research, Inderscience Publishers
3. International Journal of Human Resource Development and Management, Inderscience Publishers
4. Human Resource Development Quarterly, Wiley-Blackwell

Operations& Supply Chain Management Group D

S. No.	Subject Code	Subject Title
III Semester		
1	M-340	Materials Management
2	M-341	Total Quality Management
3	M-342	Manufacturing Planning And Control
4	M-343	Management of Business Process Outsourcing
5	M-344	Export, Import Procedures and Documentation

M-340 MATERIALS MANAGEMENT

OBJECTIVES

1. Illustrate scope, role of materials management in any organization.
2. Explain the key characteristics of purchasing system and purchasing procedure.
3. To discuss the policies of Inventory Management and how to generate overall materials plan
4. To give exposure to various aspects of warehouse management.

LEARNING OUTCOMES

1. Understand importance of materials management and its various issues in manufacturing industry.
2. Determine suitable purchase procedure for procurement and evaluate purchase department.
3. Develop integrated overall materials requirement plan.
4. Apply various inventory control techniques into practice including spare parts planning.
5. Understand the importance of warehouse management.
6. Decide on selection of supplier and evolve procedure for vendor evaluation.

Section-A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Materials Management (MM):** Scope of materials management, functions, Materials cycle, Objectives of MM, Organizing for MM and role of Materials manager, Issues in materials management.	**2**
UNIT II	**Purchase System and Procedure:** Purchasing objectives, purchase cycle, inputs to purchasing, restraints, and factors, concept of Lead time, purchasing decisions: ordering systems, Price determination and negotiation, sourcing of supply: source location and supplier selection, purchasing organization, procedures, forms, and reports, evaluation of department procedures, Legal aspects of procurement: Purchase order, bid evaluation criteria, term of purchase , INCO terms, contracting and types of contracting, Make-Buy decisions.	**4**
UNIT III	**Inventory Management:** Objectives ofinventory, functions & classification, factors affecting inventory, inventory modelling, deterministic inventory models: single item, and multi-item inventory models. Inventory models with probabilistic demand: single period models. Inventory control systems: Fixed order quantity & periodic review system.	**4**
UNIT IV	**Materials requirement planning (MRP):** Principles of MRP, Objectives of MRP system, System inputs and outputs, factors affecting the computation of requirements, processing logic, lot sizing techniques, the use of system outputs. MRP I and MRP II	**3**
UNIT V	**Spare Parts Management:** Issues, features of spares, categorization, cost reduction approach to spares. Selective inventory control: ABC, VED, SDE, HML, GOLF, SOS, FSN and	**3**

	XYZ analysis. MUSIC 3D approach. Stocking Policy for spares. Simulation for spares planning.	
UNIT VI	**SAP/ ERP System for Materials management:** SAP/ ERP Introduction, various functional modules of SAP, SAP MM enterprise structure –defined (Client, company code, plant, location, Template for SAP login menu) Template for materials management, Template for materials master configuration, Template for vendor master, Template for purchasing requisition, Various transaction codes for purchasing menu.	**3**
UNIT VII	Material Classification, Codification, Standardization and Variety Reduction. **Warehouse Management:** Reasons for warehousing, definition types, Details of factory warehouse, Warehouse layout, Terms used in warehouse (Zones, Location, equipment & stations) Role of warehouse manager, Details of functions, Industry Warehouse design considerations	**3**
UNIT VIII	**Vendor Development:** Need for vendor development, levels of vendor assessment, vendor evaluation and selection process, Key supplier evaluation criteria, vendor rating methods, managing supplier relationship, vendor managed inventories.	**2**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Study and analysis of purchasing and contracting procedure and its documents of any chemical company.
- Study and preparing of piping or any Bulk materials "Bill of materials" for any infrastructure company or any project.
- Study of Spare parts interchangeability record with use of VED analysis for any chemical company Study and prepare –a chart for Vendor selection procedure for any retail company(like Rel fresh) for supply of FMCG items.
- Study and analysis for procurement strategy by use of HML Techniques for any power plant / automobile manufacturing company.
- Study and analysis for cost reduction techniques for warehouse management, especially for waste reduction in the yarn industry.
- Prepare formats of different documents used in stores, like bin card, Material issue note, material return note, Item inspection report & item warrantee record
- Study and prepare a report for Terms and concept of SAP MM Module used by any company.

BOOKS RECOMMENDED

1. J.R.Tony Arnold, Stephen N. Chapman, Lloyd M. Clive, Materials Management, Pearson, 2012.
2. Gupta & Chitle, Materials Management, Text & Cases, PHI, 2012.
3. P GopalaKrishnan, Materials Management – Text & cases by Prentice- Hall of India,2015
4. S. Sadagopan, ERP-A Managerial Perspective, Tata McGraw Hill, 2018 Edition

5. F. Robert Jacobs and D. Clay Whybark, Why ERP? A primer on SAP Implementation, McGraw-Hill Higher Education, 2016 Edition
6. Operations Now - Byron J. Finch, 3/e, Tata Mc-GrawHill, 2008.
7. Operations Management: Along the supply chain - Russel and Taylor, 6/e, Wiley India, 2009
8. Gopalakrishna and Sundaresan, "Materials Management", TMH, 2017
9. K. Datta, "Materials Management: Procedures, Text and Cases", Pearson, 2011

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. MATERIALS MANAGEMENT - European Scientific Journal,
2. International Journal of Manufacturing,
3. Materials, and Mechanical Engineering (IJMMME),
4. International Journal of Physical Distribution & Logistics Management,

M-341 TOTAL QUALITY MANAGEMENT

OBJECTIVES

1. To introduce the students to the basic concepts of total quality management its relevance in today's context.
2. To develop understanding in the implementation of a total quality management system in an organization.
3. To develop competency in assessment of Cost of Poor Quality.
4. To introduce the system approach to quality management
5. To develop competencies in performance measurement
6. To enhance knowledge in business excellence frameworks and models

LEARNING OUTCOMES

1. Evaluate the principles of quality management and to explain how these principles can be applied within quality management systems.
2. Apply the continuous quality improvement tools and techniques for process improvement.
3. Plan for implementation of QMS.
4. Develop plans for Benchmarking and assessment as per various excellence models.
5. Explain the concept of Six Sigma its DMAIC process.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Quality Characteristics, Quality Control and Quality Assurance, Total Quality System, Quality Improvement, Management of Quality, Quality and Productivity, Total Quality Management: Basic approach, TQM Axioms, TQM framework, Benefits of TQM	**3**
UNIT II	**Philosophy of Quality Leaders and its impact:** Characteristics of Quality leaders, Philosophy of Quality Guru's: Deming's PDSA Cycle, Crosby's four absolutes of quality Management, Juran's quality trilogy, Taguchi: Quality loss function, Imai's Kaizen.	**3**
UNIT III	**Customer Driven Quality:** Customer satisfaction model, customer perception of quality, Translating customer needs into requirements (Kano Model). **Quality costs:** categories, analysis, Optimum quality cost concept.	**3**
UNIT IV	**Continuous Improvement tools:** Brainstorming, Affinity diagram, Matrix diagram, Force field diagram, Check sheet, Flow chart, cause and effect diagram, Bar chart, Run charts, histogram, Pareto chart, Scatter Diagram, Criteria rating form, Process decision program chart. **Process Quality Improvement:** Statistical Process Control, Process Capability and Acceptance sampling, Pre-Control Taguchi's Quality Engineering: Introduction to Orthogonal Arrays, Signal-to-Noise Ratio and Parameter Design.	**5**

UNIT V	**Benchmarking:** Concept, Process of benchmarking, Types of Benchmarking, Issues in Benchmarking. **Six Sigma Technique**: statistical aspect, six sigma management process, DMAIC, ultimate six sigma.	**3**
UNIT VI	**Quality Management Systems:** Definition, elements of QMS, ISO 9000 & ISO 14000 series standards.	**2**
UNIT VII	**TQM awards:** Deming Prize, Malcolm Baldridge National Quality Award, European Foundation for Quality Management's EFQM Excellence Model, Golden peacock national quality award (GPNQA).	**2**
UNIT VIII	**TQM in manufacturing sector:** Implementation, Quality in design, Quality in procurement. **TQM in service sector:** Implementation, Quality in after sales service.	**3**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

Industrial cases / Examples

- Study and prepare analysis report of quality dept. procedure and tests conducted for product of any manufacturing industry.
- Prepare a documentation and requirement report for ISO 9000 for any retail/manufacturing industry, already having ISO certification.
- Study and benchmarking of customer satisfaction for any four life insurance industry/ Banking.
- Study and prepare a report on Six Sigma applicable in the industry.
- Prepare a report suggesting an zero defect program by use of quality tools for any industry.
- Prepare a report on 5S programme for better retrieval & documentation system for any retail warehouse.
- Prepare a report with parameters study (for quality assurance in manufacturing process / raw materials) for a company suggesting necessary implementation of TQM approach with procedure indicating practical benefits.
- Study and prepare a report for a company using quality award techniques for rating their quality parameters as whole of the organization.

BOOKS RECOMMENDED

1. Dale H.Besterfield et al, Total Quality Management, Third edition, Pearson Education (First Indian Reprints 2004).
2. R. Kesavan, Total Quality management, Publiser Wiley- India, 2014 edition.
3. Evans and Lindsay, An Introduction to Six Sigma & process improvement, Cengage, 2nd Edition, 2016
4. Douglas C. Montgomory, Introduction to Statistical Quality Control, Wiley Student Edition, 7th Edition, Wiley India Pvt Limited, 2012.
5. James R. Evans and William M. Lindsay, The Management and Control of Quality, Sixth Edition, Thomson, 2010.
6. Indian standard – quality management systems – Guidelines for performance

Improvement (Fifth Revision), Bureau of Indian standards, New Delhi.
7. James W. Fairfield-Sonn, Corporate Culture and the Quality Organization Quorum Books, 2001
8. John Beckford, Quality, Routledge, 2002 (2nd edition)

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Quality Policies of Corporate
2. International Journal of Quality Control
3. The TQM Journal
4. International Journal of Quality and Reliability Management

M-342 MANUFACTURING PLANNING AND CONTROL

OBJECTIVES

1. To provide knowledge for understanding demand management system.
2. To help understand the Sales and Operations Planning for an organization.
3. To gain understanding of construction of effective Master Production Schedule.
4. To discuss the Materials Requirement Planning as a basic tool for performing the detailed material planning function
5. To provide understanding in determining the capacity requirements and to match capacity with plans
6. To discuss effective Production Activity Control system.

LEARNING OUTCOMES

1. Understand and perform demand forecasting.
2. Determine the optimum production levels to meet defined demand within specified capacity limits and prepare production plan.
3. Perform the master scheduling process.
4. Understand and manage material requirements planning.
5. Prepare a capacity plan using capacity requirement planning procedures.
6. Develop an effective Production Activity Control System

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Manufacturing Planning and Control (MPC):** The context of MPC, definition of MPC system, framework of MPC system, matching the MPC system with needs of firm, Evolution of MPC system	**2**
UNIT II	**Demand Management:** Demand management in MPC systems, Demand Management and the MPC Environment: Make-to-Stock (MTS), Assemble-to-Order (ATO), Make (Engineer)-to-Order (MTO), Communicating with Other MPC Modules and Customers, Information use in Demand Management, Providing Appropriate Forecast Information: Forecasting Framework, Forecasting for Strategic Business Planning, Sales Operations Planning, Master Production Scheduling and Control. Producing and Evaluating Detailed Forecasts: Moving Average, Exponential Smoothing. Evaluating and using Forecasts, Considerations for Aggregating Forecast, Pyramid Forecasting, Organizing for Demand Management	**3**
UNIT III	**Sales and Operations Planning (SOP):** SOP in the Firm, SOP Process: Monthly SOP, SOP displays, strategies for SOP, chase strategy, pure and mixed strategies, basic trade-offs and evaluating alternatives. Management Obligations for SOP: Functional Roles, integrated strategic planning, Controlling the Operations Plan, Organizational aspects of SOP.	**3**
UNIT IV	**Master Production Scheduling(MPS):** MPS activity, Techniques of MPS, Bill of materials structuring for MPS, Assembly schedule, Master production scheduler and examples,	**2**

MPS stability.

UNIT V	**Material Requirements Planning(MRP):** MRP in manufacturing planning and control system,Record Processing: Basic MRP record, product structure tree, Bill of materials, gross to net explosion, lead time offsetting, linking MRP records, Technical Issues: Processing frequency, bucketless systems, lot sizing, safety stock and safety lead time, low-level coding, pegging, firm planned orders, service parts, planning horizon, scheduled receipts, planned order release. Using the MRP System and system dynamics.	**2**
UNIT VI	**Just-in-Time (JIT) in MPC:** Major elements of JIT, JIT's impact on MPC, JIT Building blocks, Applications: Kanban, Toyota Production System (TPS). Nonrepetitive JIT, JIT software and managerial implications. JIT manufacturing framework.	**3**
UNIT VII	**Capacity Planning and Utilization:** The Role of Capacity Planning in MPC Systems, Hierarchy of Capacity Planning Decisions, Links to Other MPC System Modules, Capacity Planning and Control Techniques, Capacity Planning Using Overall Factors (CPOF), Capacity Bills, Resource Profiles. Capacity Requirements Planning (CRP), Scheduling Capacity and Materials Simultaneously, Finite Capacity Scheduling, Finite Scheduling with Product Structure, Using APS Systems, Management and capacity planning/utilization: input/output control, managing bottleneck capacity, choosing the measure of capacity.	**3**
UNIT VIII	**Production Activity Control (PAC):** Framework for PAC, MPC System Linkages, Linkages between MRP and PMC, Just-in-Time Effect on PAC. Production Activity Control Techniques: Basic Shop-Floor Control Concepts 374 Lead-Time Management, Gantt Charts, Priority Sequencing Rules, Theory of Constraints (TOC) Systems, Vendor Scheduling and Follow-up.	**3**
UNIT VIII	**Enterprise Resource Planning (ERP):** Definition, software imperatives, scope of ERP applications, MPC fit with ERP, Performance metrices to evaluate integrated system effectiveness. Advanced Concepts in MPC: Introduction to Disaggregation. concept of linking firms MPC system with corporate strategy: MPC design options, integrating MRP and JIT. Introduction to Flexible manufacturing system.	**3**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

Case study and Examples: Manufacturing industry:

- Study and prepare a production schedule of a multiproduct manufacturing unit, based on previous year schedule (tyre& paint industry or others)

- Study and report preparation on furcating of a four vehicle segment industry.
- Study and analysis of safe working practice in a chemical and petro-chemical plant and their procedure
- A report on Flexible manufacturing system indicating the improvement process and benefits for any consumer product manufacturing unit, like frig, washing machine, air conditioner etc.
- A report on multilevel bill of materials and prepare a MRP requirement for a specific period (retail sector or others).

BOOKS RECOMMENDED

1. Seetharama, Peter J., Dennis W, Production planning & inventory control, PHI Publication,2015.
2. Stephen N. Chapman, The fundamentals of production planning and control, Pub., Pearson, Prentice hall, 2006.
3. Production and operation management- S N Chary- Tata McGraw hill, 2017.
4. Aswathappa & Bhat, Production and operation management- HimaLaya Publication House. 2016
5. Buffa, Modern Production & Operation Management –Wiley India, 2012.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International journal of Production Planning & Control,
2. International Journal of Production and Inventory Management,
3. Journal of Production and Operations Management,
4. European Journal of Operations Management,

M-343 MANAGEMENT OF BUSINESS PROCESS OUTSOURCING

OBJECTIVES

1. To introduce the students to the basic concepts of outsourcing.
2. To study the scenario of Outsourcing in India and the Global scenario.
3. To discuss related issues such as knowledge transfer, culture change.

LEARNING OUTCOMES

1. Learning the Factors to Consider for Selecting BPO/ KPO Partner.
2. Learn the important concepts, tools, and uses of Business Process Outsourcing.
3. Learn about the benefits of implementing Business Process Outsourcing processes in your work place.
4. Learn about the importance of communication skills in Business Process Outsourcing.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to BPO/KPO& Business Process Management:** Introduction to Outsourcing., Business Process Outsourcing and Knowledge Process Outsourcing, Outsourcing Objectives, Types of BPO/KPO, Emerging BPO domains. Global scenario in Outsourcing. BPO / KPO in India - Historical overview and Current trends, BPO vendor selection, Managing Buyer vendor relationship, Execution of an outsourcing project. Outsourcing contracts.	**3**
UNIT II	**Data Protection and Security:** Introduction to Data protection and security, definition of Data types of data-principals and code of practices, Data Protection Act 1998, Role of data protection authority, Data Security standards and measures.	**3**
UNIT III	**Back Office Operations:** Emergence and Concepts of Back office operations Functions, tools and techniques of back office operations. Use of technology on back office operations Transformation processes - Back office and front office operations.	**3**
UNIT IV	**Voice and Accent Training:** Communication : Process of communication, Conversational skills, Language and its function, Ways to handle customer and different types of customers, Telephone Ethics: Basic telephone rules, Making a call (During and after), Gathering Information by telephone (Before and After), Answering the telephone (before and during), Listening Skills: What is Listening, Types of Listening, Ten Aids to good listening, Communication Games, Voice:Vocal Qualities, Mechanics of speech, Vocal Modulation, Practice of Pitch, Volume, Diction, Speed & Tone, Diphthongs, Accent:MTI removal (s, sh, zh, z), How to use convincing accent, Vowel and consonant sound, Pronunciation Drills, Drills on tongue twisters, Learn the International phonetics AlphabetsLearn to make the American/British sounds.	**6**

UNIT V	**Customer Relationship Management:** Introduction to E-CRM, Evolution of CRM, Concepts and relevance of E-CRM in Indian Outsourcing industry.E-CRM and Conventional CRM, Benefits of E-CRM Implementation of E-CRM in Business.	**3**
UNIT VI	**Six Sigma Quality in Outsourcing:** Concepts, theories and emergence of Total Quality Management and six-sigma. Six sigma tools and techniques –DAMIC.	**2**
UNIT VII	**Infrastructure Considerations and Challenges:** Infrasturcture- Variety of infrasture, critical considerations in infrastructure, software and hardware infrastructure.	**2**
UNIT VIII	**Outsourcing in Human Resource Function:** Introduction,New role of HRoutsourcing,benefits of HR outsourcing, in house HR administration and V/s oursourcing,measuring the outsourcing HR function.	**2**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

Case Study on each module:

- Prepare a report for lost sales of a drinking water bottles manufacturing company for its quality improvement by six sigma approach and analysis of problems by fishbone diagram
- Study and prepare a report on communication system at BPO indicating learnings.
- Study and analysis of ECRM process of any company
- Study and report preparation for back office operations of an education industry.
- Prepare a report for ,how data are transfer and kept privacy of data in KPO firms.

BOOKS RECOMMENDED

1. SarikaKulkami , Business Process Outsourcing, 2012
2. J Brian Heywood, The Outsourcing Dilema.2015
3. Rick L Click and Thomas N. D., business process outsourcing, Pub Wiley, 2015
4. K ShridharaBhat, Business process outsourcing, Pub Himalaya, 2018
5. MadhaviGarikaparthi , E-CRM- Concepts and Cases. ICFAI Publication,2017
6. David Salomon, Data privacy and security, 2018
7. BalaBhaskaran P, KPO: A Shifting Paradigm Book Description, 2018
8. Hammonds, Data protection by Click &Duneining , 2016
9. Business Process Outsourcing-The Competitive Advantage. 2013

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Business Law
2. Journal of Business Research
3. Journal of International Business Studies
4. European Journal of Outsourcing.

M-344: EXPORT AND IMPORT PROCEDURES AND DOCUMENTATION

OBJECTIVES

1. Make understand the critical documentation and their specification
2. To know the steps for obtaining import –export licencing procedure and requirement
3. Understand Indian government initiatives and policies for exports promotion

LEARNING OUTCOMES

1. Develop an understanding of the importance of import and exports procedures
2. Develop qualities to become an entrepreneur or consultant for export and import procedures
3. Carry out certification course at later stage for becoming government associate in shipping industries
4. Develop an in-depth understanding of export packaging and logistics management at shipment process

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Preliminaries for Export:** Meaning of export & import, classification of import and exports, Categories of Exporters, Identifying foreign market, methods of entering international markets, Constraints in entering foreign markets.	**2**
UNIT II	**Evolution & Environment and organizations in International trade:** Classical theory of international trade, different aspect of demographic, social, cultural economic, political competitive environment , Introduction and features of GATT and WTO.	**2**
UNIT III	**Framework for India's Foreign Trade:** Introduction of Laws governing India's export – Import trade, A snapshot and major features of foreign trade policy (latest), Brief role and main function of institutions of foreign trade, (DGFT, EPC, IIFT, CB, FEIO, NCIT and STC).	**2**
UNIT IV	**Export Procedure and Method of Payment :** Stepped features and details in obtaining export licence Introduction, brief registration procedure, obtaining IEC number and RCMC , role of custom house agent (CHA), pre-shipment, shipment and post shipment features and requirements, procedure for shipping and custom clearance, procedure for marine insurance policy and procedure of filing insurance claim, Method of Payments and policy assistance, Letter of credit and operation through bankers, Types of letter of credit their features and risk involvedProcedure for opening letter of credit, advantages of LC, Role of commercial, EXIM banks.	**4**
UNIT V	**INCO TERM- 2010 and 2020:** Introduction of incoterms, their rules and categories (E,F, C and D) and added features in Incoterm 2020 v/s 2010, Specific features and	**4**

	destination in export and import for Air way- Ex works (EXW),Free carrier (FCA), Carriage paid to (CPT),Carriage and insurance paid to (CIP), delivery at place (DAP), Delivery at place unloaded,(DPU)Delivery duty paid (DDP) Water Way (sea worthy)- EXW, FCA,(same) Free alongside ship(FAS), Free on Board (FOB), cost and freight (CFR), Cost insurance and freight(CIF) and D terms same as air way.	
UNIT VI	**International Trade documents :**Specific features of aligned document system, categorization of documents as Master document- I and Master document-II (only name and description of documents), International trade documents, their features, specific purpose and standard format, Performa and commercial invoice, packing list, shipping bill, certificate of origin, Consular invoice, Mate receipt, Bill of lading, Guaranteed Remittance (GR) form, bill of exchange, Airway bill, Bill of Entry, Certificate of inspection, Certificate of measurement.	**4**
UNIT VII	**Incentives and Assistance for Exporters:** Duty drawback and Procedure for its calming , Major features of Export promotion capital goods scheme (EPCG), deemed exports, EOU's, EHTP, STP,SEZ, Agri export zones, Assistance to states for developing Export infrastructure and allied activities (ASIDE).	**2**
UNIT VIII	**Import procedure - brief notes and features:** Introduction, categories of import, import licence, import contract, pre import procedure, legal dimensions of import procedures, custom clearance and warehousing of imported goods, Exchange control provisions for import, Import risk and import duty, valuation of Custom duties, Import incentives under special schemes.	**4**

Section B

At least one case study/ problem from each unit. Questions will be case/ inferences/ application based

PRACTICAL COMPONENT

- Prepare a chart for international supply indicating the logistical destination and scope of seller and buyer (column) along with related Incoterms 2010/2020 (rowwise).
- Prepare the documentation for 20 tons of steel supply from SAIL , Mumbai to Shanghai, Chaina, Seaworthy.
- Calculate the price of total transection for seller based at NY, USA and Buyer at Tokyo, Japan. Supply of 2500 pair shoe with unit price $ 15.0, Custom duty (CIF) 12% of CIF price, Insurance 1% of FOB price, Ocean fright $ 2000, USA Inland fright $0.50 per pair, Japan inland freight $ 1000 per shipment, loading and unloading charges are inclusive (Tokyo). Calculate ExW at NY, FOB Los Angelis, CIFyokohama, DDU Tokyo and DDP Tokyo.

- Write examples of items covered in each category of import .
- Explain the prerequizte of SEZ park acquization and licencing for bulk item.
- Ten nos laptop are being procured from Yokoham, Japan to Mumbai India Explain the steps of airworty procurement at final primices destination Andheri west, building no 4, bandraKurla complex, Mumbai.
- Prepare a path and paste display box for obtaining export licence for petroleum product from seaworthy.
- Explain the types of letter of credit and their features. Which letter of credit will be most suitable for supplying marble from Jaipur, India to Jakarta, Indonesia through seaworthy and considering destination for minimum risk consideration to supplier
- What is specific use of mate recipt, shipping bill, bill of ladding, certificate of origin. Which is the most important document to make a claim from marine cum insurance policy due to mishap of shipment.

BOOKS RECOMMENDED

1. Khushpat S Jain, and Apexa V Jain, Foreign Trade- Theory, procedures, practices and documentation, Himalaya Publishing, 8th Edition,2019
2. C. Rama Gopal, Export import procedure, documentation and Logistics, New age International pub., 2008, ISBN (13) : 978-81-224-2326-6
3. Belay,Seyoum, Export import theory, practices, procedures, Routledge, T & F group, NY,3nd Edition.-2009.
4. Donna L Bade, Export Import procedure and documentation – American Management association , 2009
5. (AMA, V edition, 2015) , www.amanet.org, ISBN-978-0-8144-3475-8(hardcover:alk.paper)
6. Thomas E Jhonson, Export Import procedure and documentation- American Management association (AMA, IV edition,), ISBN 0-8144-0734-X (hardbound)

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Export Marketing
2. The Journal of International Trade & Economic Development
3. The International Trade Journal
4. Asian journal of Import and export

Management Group E

S. No.	Subject Code	Subject Title
III Semester		
1	M-350	Software Engineering
2	M-351	E-Business
3	M-352	Strategic Management of Information Technology
4	M-353	Information Security and Cyber Law

M-350: SOFTWARE ENGINEERING

OBJECTIVES

1. To learn and understand the concepts of Software Engineering.
2. To apply the project management and analysis principles to software project development.
3. To apply the design & testing principles to software project development.

LEARNING OUTCOMES

1. Understand software specifications to classify different types of software models.
2. Understand Software Design Process and different Software Testing techniques.
3. Analyze cost of software projects using cost estimation models.
4. Able to explain the software engineering principles and techniques that are used in developing quality software products.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Software Engineering Fundamentals:** Software Engineering - A layered Technology, The importance of software, Software Characteristics, Software myths, Software Engineering Paradigms, Software Components, Role of management in software development.	**2**
UNIT II	**Software Process Models:** Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Software Process Models: Incremental Model, Spiral Model, Component Assembly Model, Formal Methods, Fourth-Generation Techniques.	**3**
UNIT III	**Software Requirement Engineering :** Requirements Engineering, System and software requirements, Types of software requirements: Functional and non-functional requirements, Domain Requirements, User Requirements, Feasibility Study, Requirements Elicitation: Overview of techniques ,Viewpoints, Interviewing , Scenarios, Use-cases	**3**
UNIT IV	**Software Requirement Specification:** Requirement Analysis: Entity Relationship Diagram, Data Dictionary, Requirement Validation, Requirement Documentation, Requirement Management, Requirement Specification: Software requirement Specification (SRS), Structure and contents, SRS format.	**3**
UNIT V	**Software Project Planning:** Software Project Planning, Size Estimation, Cost Estimation, Models, Static, single variable models, Static, Multivariable Models, COCOMO, Risk Identification and Projection: RMMM, Project scheduling and Tracking.	**4**
UNIT VI	**Software Design Process:** Design concepts: Abstraction, Architecture, Patterns, Modularity, Cohesion, Coupling, Information hiding, Functional independence, Refinement, Design of input and Control, User Interface Design: Elements	**3**

	of good design, Design issues, Features of GUI.	
UNIT VII	**S/W Testing Fundamentals:** Verification and validation, Techniques of testing: Black-box and White-box testing, Inspections, Levels of Testing: Unit Testing, Integration Testing, Interface Testing, System Testing, Alpha and beta Testing, Regression Testing, Design of test cases.	**3**
UNIT VIII	**Software Maintenance & Quality Assurance:** Maintainability – maintenance Tasks, Characteristics of a good quality software. Quality management activities, Product and process quality Standards: ISO9000, Capability Maturity Model (CMM).	**3**

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICALCOMPONENT

1. Preparing Software Requirements Specifications.
2. Identifying Domain Classes from the Problem Statements.
3. Creating document after completion of software design phase.
4. Modeling UML Use Case Diagrams.
5. Designing Object Oriented Metrics
6. Designing Test Cases.

BOOKS RECOMMENDED

1. Roger S Pressman, Bruce R Maxim, "Software Engineering: A Practitioner"s Approach", 8th Edition, 2019.
2. Ian Sommerville," Software engineering", Addison Wesley Longman, 9th Edition, 2017.
3. Ali Behforooz, Hudson, "Software Engineering Fundamentals", Oxford, 2009.
4. Hans Van Vliet ," Software Engineering Principles and Practice",3rd Edition,Wiley, 2010
5. Ali Behforooz, Hudson, "Software Engineering Fundamentals", Oxford, 2009.
6. K.K. Aggarwal, Yogesh Singh, "Software Engineering", 3rd Edition, 2008

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. IEEE Transactions on Software Engineering, IEEE
2. Journal of Systems and Software, Elsevier
3. Journal of Software: Evolution and Process, Wiley
4. ACM Transactions on Software Engineering and Methodology, ACM

M-351: E-BUSINESS

OBJECTIVES

1. To understand terminology and concepts of e-Business and the impact of e-Business on society and market commerce.
2. To become aware of the global nature of e-Business and how traditional means of doing business will need to change in the electronic age.
3. To identify organizational processes and relationships that may have value added, through the application of an e-Business strategy.

LEARNING OUTCOMES

1. Understand the E- business infrastructure and trends and Integrate theoretical frameworks with business strategies
2. Analyze different types of technologies and methodologies used for developing e-Business.
3. Analyze real business cases regarding their e-business strategies and transformation processes and choices.
4. Understand the knowledge hierarchy to e-Business and related business processes and marketing techniques.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Overview:** Definitions Of Electronic Commerce/ Electronic Business, Characteristics, Elements of e-Business, Categories Of e-Business (B2B, B2C, B2A etc.), Role of e-Business, Difference between E-Business and E-commerce, Evolution of e-Business	**2**
UNIT II	**Building Blocks of e-Business:** e-Business infrastructure components, Managing e–business infrastructure–Hardware and Software, Technical e-Business challenges, Internet Technology, Web Technologies & Applications, Collaborative Technologies–EDI, Workflow systems, Building e-presence– need of a website	**3**
UNIT III	**Electronic Markets:** Definition and use of Electronic Markets, Advantages , Disadvantages, Electronic Market vs Traditional Market, Functions and Working of e-Markets, Electronic Market Success factors, Online Market Place Analysis, Location of Trading in Market Place	**3**
UNIT IV	**e-Business Strategies:** Introduction, Levels of e-Business Strategy, The changing competitive agenda–Business & Technology drivers, e-Business Models, Strategic Analysis, Theory of competitive strategy, Success factors for implementation of e- Business Strategies	**3**
UNIT V	**e-Business Applications:** **e**-Procurement, e-Payment Systems, ERP, e-SCM, e-CRM, e-Governance, e-Marketing, e-Advertising, e-Sales, e-Products, Internet Shopping and the e-Shop	**4**
UNIT VI	**The Impact of e-Business on Different Fields and Industries:** e-Tourism, Employment and Job Market Online,	**3**

	Online Real Estate, Online Publishing and e-Books, Banking and Personal Finance Online, On-Demand Delivery Systems and E-Grocers, E-Learning and Online Education	
UNIT VII	**Contemporary Issues in e-Business:** Reliability for e–Business, Quality requirements, Trust, e – Business Risk, e–Business security mechanism, Designing for Security – Assessing the security needs for the firm, Establishing a good policy, Fulfilling web security needs, Structuring the security environment, Monitoring the system	**3**
UNIT VIII	**Impact Of e-Business On Society:** Issues Related To The Job Market, Current Global Situation, Work Patterns, Skills Required And Continuous Learning, How Local Becomes Global, Positivity Of IS/IT, What Needs To Be Done In Order to cater for the future e-Business/Information Society?	**3**

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICALCOMPONENT

1. Study of marketing strategies of any two companies.
2. Analyzing Mission and Vision statements of any five companies and comparing them.
3. Learning the concept of Michael Porter's five forces model through its application to any one industry (Retail, Telecom, Infrastructure, FMCG, Insurance, Banking etc.)
4. Analyzing the change in the internet architecture in order to measure and sustain relevant e-Business criteria.
5. Study on the impact of e-Business on Industry and Society with 2 Real Life examples
6. Comparing the growth trends of any 2 retail outlets with the e-Business applications and without e-business applications.

BOOKS RECOMMENDED

1. J Deitel, Deitel & Nieto, Internet and World Web- How to Program, Paperback – Import, December 1999
2. J Deitel, Deitel & Nieto, e-Business and e-Commerce How to Program, Pearson, 2001
3. Dave Chaffey, e-Business & e-Commerce Management: Strategy, Implementation, Practice, Pearson Education, 5th Edition, 2013
4. Michael P. Papazoglou, Pieter Ribbers, e-Business: Organizational and Technical Foundations, Wiley India (P) Ltd, January 2006
5. Colin Combe, Introduction to E- Business: Management and Strategy, Elsevier Ltd., February 2006
6. Jelassi, Tawfik, Martínez-López, Francisco J, Strategies for e-Business, ISBN 978-3-030-48950-2, 2020

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Electronic Business, Inderscience Publications
2. International Journal of e-Business Research (IJEBR), IGI Global
3. International Journal of Electronic Business Management, Inderscience Publications
4. e-Business - Global Journals

M-352: STRATEGIC MANAGEMENT OF INFORMATION TECHNOLOGY

OBJECTIVES

1. To develop an understanding of use of Information Technology as a Strategic Tool for Business Management.
2. To enable the development of Information Technology Leadership and identification of IT strategies to support the firm's global business goals and operation.
3. To help learners to determine IT planning methods that support strategic development within an organization and make an effective contribution to the IT planning process.

LEARNING OUTCOMES

1. Understanding of IT strategic decisions that organizations make and have an ability to engage in strategic planning.
2. Knowledge of the basic concepts, principles and practices associated with strategy formulation and implementation.
3. Ability to integrate and apply knowledge gained in basic concepts to the formulation and implementation of strategy from holistic and multi-functional perspectives.
4. Acquisition of skills to analyze and evaluate critically real life company situations and develop creative solutions, using a strategic management perspective.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Key Issues in Information system & Management, the Role of CEO. Sustaining Competitive Advantage of use of IT & Management. I.T. & Intensive Strategic Growth, Introduction to Strategic Management-Concept importance of strategic Management, Role of IT in strategic management, strategic management issues, Strategy management for IT services, Stages of IT Strategic Management	3
UNIT II	**Strategic Planning of IT:** Introduction of an IT strategic plan, Components of IT Plan, IT strategic Plan model, phases in development of IT strategic Plan, challenges in implementing an IT Strategy Plan	3
UNIT III	**Enterprise Architecture:** Enterprise IT design, Enterprise integration, Enterprise ecosystem adaptation, Architecture of an enterprise, enterprise architecture development	2
UNIT IV	**IT Landscape Management:** Importance of IT Landscape, Landscape Architecture, Business Model Innovation for Sustainable Landscape	2
UNIT V	**Analyzing Business Environment:** Creative Learning, Organizational Learning and Role of Information technology in Business Transformation, Analytical Framework for Strategic IT Initiatives.	3
UNIT VI	**Competitive Strategy And Competitive Advantage In IT:** Industry and competitive analysis, strategy and	4

	competitive advantage, Strategic Growth of Information Technology , Impact of Competitive Strategy and Information Technology	
UNIT VII	**Recent Trends In Strategic Management In IT Sector:** Introduction, Strategic Thinking, Organizational Culture and its Significance, Organizational Development and Change, Strategic leadership, Models of Leadership Styles and its Roles, Creating effective Organizational designs. Managing innovation and fostering corporate entrepreneurship.	4
UNIT VIII	**Technical Standardization:** Information Partnerships, Managing in the Market space- National Information Infrastructure and IT Policy at the National Level. Planning for strategic IT Resource. Managing the IT Function. Outsourcing IT Function.	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICALCOMPONENT

1. Implement the transformation of corporate goals into IT goals.
2. Case study on developing a five year plan using IT strategies for growing the business beyond its current operations.
3. Case study to develop a function to reduce risks & costs through efficient use of IT resources, quality services.
4. Case study on IT contribution to develop a new business model.
5. Case study of an efficient IT strategy for a business scenario.
6. Case study to show the importance of IT in strategic business decisions.

BOOKS RECOMMENDED

1. Hitt, M., Ireland, R. and Hoskisson, R. "Strategic Management: Competitiveness and Globalization – Concepts", 9th edition, Cincinnati, OH: Southwestern College Publishing, 2010.
2. Hanschke, Inge, "Strategic IT Management: A Toolkit for Enterprise Architecture Management", 1st edition, Springer publication, 2009.
3. Anand Thakur, "Strategic Management", 1st edition, Excel Books Private Limited, 2018.
4. Pilorget, Lionel, Schell, Thomas, "IT Management", 1st edition, Springer Vieweg, Wiesbaden, 2018.
5. Fred R. David ,"Strategic Management: Concepts and Cases", 16th edition ,Pearson publication, 2017.
6. Ewa, Ziemba, "Information Technology for Management",1st edition, Springer publication, 2015.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. The International Journal of Information Systems Theories and Applications, Elsevier
2. International Journal of Information Technology and Management, Inderscience publications
3. Strategic Management Journal, Wiley Online library
4. Journal of Information Technology, Palgrave Macmillan Ltd.

M-353: INFORMATION SECURITY AND CYBER LAW

OBJECTIVES

1. To enable to understand the fundamental principles of Information Security and the importance of security in daily lives in the IT field.
2. To provide understanding of Infrastructure and Information Security
3. Elementary understanding of the authorities under IT Act and help comprehend Penalties and offences under IT Act.

LEARNING OUTCOMES

1. Gain fundamental Information Security and business knowledge.
2. Acquire knowledge regarding IT Act, 2000.
3. Design countermeasures against common Information Security Attacks.
4. Implement Information Security in a Network Environment.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Security threats, Sources of security threats, Motives, Target Assets and vulnerabilities – Consequences of threats, E-mail threats, Web threats, Intruders and Hackers, Insider threats, Cyber-crimes. Network Threats: Active/ Passive – Interference, Interception, Impersonation, Worms, Virus, Spams, Ad ware, Spy ware, Trojans and covert channels, Backdoors, Bots, IP, Spoofing, ARP spoofing, Session Hijacking, Sabotage, Internal treats Environmental threats, Threats to Server security.	3
UNIT II	**Internet and Web security**: Web Servers and Browsers, HTTP, Cookies, Caching, Plug-in, ActiveX, Java, JavaScript, Secure Socket Layer (SSL), Secure Electronic Transaction (SET). E-mail Risks, Spam, E-mail Protocols, Simple Mail Transfer Protocol (SMTP), Post Office Protocol (POP), Internet Access Message protocol (ICMP). **Secured Mail**: Pretty Good Privacy (PGP), S/MIME(Secure/Multipurpose Internet Mail Extensions)	4
UNIT III	**Electronic Business and Legal Issues:** Evolution and development in Ecommerce, paper vs paper less contracts, E-Commerce models Security. Application area: Business, Taxation, Electronic Payments, Supply Chain, EDI, E-markets, Emerging Trends.	2
UNIT IV	**Authentication**: Definitions, Types of authentication, Password Authentication, Password Vulnerabilities & Attacks: Brute Force & Dictionary Attacks. Password Policy & Discipline, Single Sign-on – Kerberos, Alternate Approaches, Biometrics: Types of **Biometric Techniques**: False Rejection, False Acceptance, Cross over Error Rates.	3
UNIT V	**Infrastructure and Information Security;** Risk Management, Basics of Cybercrime: Digital Evidence and Computer Forensics, Interception, Search and Seizure, and Surveillance	3

UNIT VI	**Cyber Forensic Basics-** Introduction to Cyber Forensics, Cell Phone / Mobile Forensics, Computer Ethics and Application Programs, Storage Fundamentals, File System Concepts, Data Recovery	3
UNIT VII	**Cyber Crimes and Cyber Laws-** Introduction to IT laws & Cyber Crimes – Internet, Hacking, Cracking, Viruses, Virus Attacks, Pornography, Software Piracy, Intellectual property, Legal System of Information Technology, Social Engineering, Mail Bombs, Bug Exploits, and Cyber Security	3
UNIT VIII	**IT acts and Cyber Laws IT Act:** Salient Feature of IT Act 2000, Legal Provisions under the Information Technology Act, Recent amendments by the IT (Amendment Act) 2008, ActSection66(A, B, C, D, E, F), IT Act Section 67 (A,B,C)	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICALCOMPONENT

1. Antivirus installation, Biometric techniques.
2. Setting up Email Encryption
3. Setting up browser security and Digital signature.
4. Investigation of malicious applications
5. Password management

BOOKS RECOMMENDED

1. K.Kumar, "Cyber Laws: Intellectual property & E Commerce, Security",1st Edition, Dominant Publisher,2011.
2. Vakul Sharma, "Information Technology Law and Practice- Cyber Laws and Laws Relating to Ecommerce" Paperback Edition, Universal Law Publishing, 2016
3. Pawan Duggal, "Cyber Law ", 2nd Edition, Lexis Nexis, Universal Law Publishing, 2018
4. William Stallings, "Cryptography and Network Security: Principles and Practice", 8th Edition, Pearson Education, 2018.
5. Jack Balkin, James Grimmelmann, Eddan Katz, Nimrod Kozlovski, Shlomit Wagman, Tal Zarsky, "CYBERCRIME: Digital Cops in a Networked Environment ", NYU Press, 2007.
6. William Stallings and Lawrie Brown, "Computer Security: Principles and Practice", Prentice Hall, 2008.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. National Journal of Cyber Security Law, STM Journals.
2. The Computer Law and Security Review, Elsevier.
3. International Journal of Information Security and Cybercrime, Romanian Association for Information Security Assurance (RAISA).
4. Info security Magazine, Info security Group.
5. CISO MAG, Information Security Magazine.

Business Analytics Group F

S. No.	Subject Code	Subject Title
III Semester		
1	**M-360**	Data Science & Analytics
2	**M-361**	Data Warehousing & Data Mining
3	**M-362**	Big Data Technologies
4	**M-363**	BlockChain Technologies

M-360: DATA SCIENCE & ANALYTICS

OBJECTIVES

1. Develop in depth understanding of the key technologies in data science.
2. Apply principles of data science to the analysis of business problems.
3. Understand and integrate data science and analytics capabilities into the formation of situation analysis.

LEARNING OUTCOMES

1. Apply mathematical principles to the analysis of data.
2. Analyze very large data sets in the context of real world problems.
3. Demonstrate knowledge of statistical data analysis techniques utilized in business decision making.
4. Formulate and use appropriate models of data analysis to solve hidden solutions to business related challenges.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Data Science:** Evolution of Data Science, Data Scientist vs. Data Engineer vs. Business Analyst, Data Scientists Roles and Responsibility, Career in Business Analytics, Stages in a Data Science Project, Applications of Data Science in various fields, Data Security Issues. Data Science Project Life Cycle: Business Requirement, Data Acquisition, Data Preparation, Hypothesis and Modeling, Evaluation and Interpretation, Deployment, Operations, Optimization.	3
UNIT II	**Introduction to Big Data:** What is big data, why big data, convergence of key trends, unstructured data, industry examples of big data, web analytics, big data and marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, big data and healthcare, big data in medicine, advertising and big data, big data technologies, introduction to Hadoop.	2
UNIT III	**Introduction Evolution of Cloud Computing**: Essential Characteristics of cloud computing – Operational models such as private, dedicated, virtual private, community, hybrid and public cloud, Service models such as IaaS, PaaS and SaaS – Example cloud vendors – Google cloud platform, Amazon AWS, Microsoft Azure	2
UNIT IV	**Machine Learning Foundations**: Overview, Design of a Learning System, Types of Machine Learning, Supervised Learning and Unsupervised Learning, Mathematical Foundations of Machine Learning, Applications of Machine Learning.	3
UNIT V	Application of Business Analysis: Retail Analytics, Marketing Analytics, Financial Analytics, Healthcare Analytics, Supply Chain Analytics.	4
UNIT VI	**Statistical Analysis:** Introduction to statistics, Meaning and scope, Limitation of Statistics, Data, Types of data, Methods	4

	of data collection, Presentation of data, Tabulation, Frequency Distribution , Graphical Representation	
UNIT VII	**Introduction to data analytics:** Types of data analytics, Applications of data analytics, Big Data versus Analytics; Analytics trends and the industry trend of leveraging analytics.	2
UNIT VIII	**Descriptive Analytics:** Analytics, Sampling distributions, resampling, statistical inference, prediction error. Regression modeling, Predictive analytics, Demand Forecasting, Prescriptive analytics, Making impact with analytics: Understand the 4Ps (Problem, Product, People & Process); Communicating Analytics.	4

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based PRACTICAL COMPONENT

PRACTICALCOMPONENT

1. Perform Case Studies on Data Science projects
2. Explore machine learning tool "WEKA"
3. Perform data preprocessing tasks and Demonstrate performing on Statistical data
4. Load dataset into Weka and perform Machine learning algorithms
5. Perform Regression using Excel
6. Explore other Statistical methods and visualization techniques in Excel

BOOKS RECOMMENDED

1. Foster Provost & Tom Fawcett, " Data Science for Business", O' Reilly, 2013
2. James Warren and Nathan Marz, "Big Data: Principles and Best Practices of Scalable Realtime Data Systems", Manning Publications, 2015
3. Anil Maheshwari, " Data Analytics", McGrawHill Publications, 2017
4. Ramesh Sharda, Dursun Delen & Efraim Turban, "Business Intelligence, Analytics, and Data Science: A Managerial Perspective", Pearson, 4th Edition, 2017
5. Toby Velte, Anthony Velte & Robert Elsenpeter, "Cloud Computing, A Practical Approach", McGraw Hill Education, 2017
6. Hans Weber, "Big Data and Artificial Intelligence: Complete Guide to Data Science, AI, Big Data and Machine Learning", Editorial Alex Pubished, Vendedor Draft2Digital, LLC 2020

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Data Science, Methods, Infrastructure, and Applications, IOS Press.
2. Data Science Journal, CODATA, Paris, France
3. International Journal of Data Science, Inderscience Publishers.
4. International Journal of Data Analytics (IJDA), IGI Global.

M-361: DATA WAREHOUSING & DATA MINING

OBJECTIVES

1. To teach principles, concepts and applications of data warehousing
2. To introduce the task of data mining as an important phase of knowledge discovery process
3. To inculcate Conceptual, Logical, and Physical design of Data Warehouses, OLAP applications and OLAP deployment

LEARNING OUTCOMES

1. Perform the data preparation tasks and understand the implications Apply, analyze various Data warehouse models
2. Develop an understanding of the strengths and limitations of popular data mining techniques and to be able to identify promising business applications of data mining.
3. Acquire the knowledge of managing, economics for conventional, modern and future Data warehousing and Data Mining.
4. Understanding of the alternative knowledge representations such as rules and various Mining Techniques

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction to Databases and Transactions:** Classification of Data, Introduction to database system, purpose of database system, Types of database management system, relational databases, database architecture, transaction management	3
UNIT II	**Data Warehousing:** Introduction, Definition, Difference between Data Mining and Data Warehouse, Multidimensional data transformation, OLAP operations, Data Warehouse schema, Data Warehouse Server	3
UNIT III	**Data Pre-processing:** Introduction, Data Cleaning, Descriptive Data Summarization, Data Integration and Transformation, Data Reduction, Data Discretization.	3
UNIT IV	**Data Mining:** Introduction, Definition, KDD vs. DM, DBMS vs. DM, DM Techniques, Issues and Challenges in DM, DM Applications.	3
UNIT V	**Association Rules:** Generalized association rule, Basic Algorithms, Concepts of Lift, Confidence and Support Parameters, Measuring the Quality of Rules, Market Basket Analysis	3
UNIT VI	**Classification:** Parametric and Non-parametric technology, Introduction to classification, Types of classification **Artificial Neural Networks The Neuron:** Activation Function, Gradient Descent – Stochastic Gradient Descent, Back Propagation – Business Problem	3
UNIT VII	**Clustering:** Introduction to Cluster Analysis, Hierarchical and Non-hierarchical Techniques, Similarity and Distance Measures	3
UNIT VIII	**Applications and Trends in Data Mining:** Data Mining applications , Introduction to Data mining System Products	3

and Tools , Introduction to Web Mining and Text Mining

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICALCOMPONENT

1. Perform Case Studies on Data Warehouse models.
2. Compare OLAP vs. OLTP
3. Apply different discretization filters on numerical attributes on association rule algorithm. Study the rules generated. Derive interesting insights and observe the effect of discretization in the rule generation process.
4. Exercise the data mining techniques with varied input values for different parameters.
5. Compare classification results of different algorithms.
6. Compare clustering results of different algorithms.

BOOKS RECOMMENDED

1. Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Third Edition, Elsevier, 2012.
2. Alex Berson and Stephen J.Smith, Data Warehousing, Data Mining and OLAP, Tata McGraw – Hill Edition, 35th Reprint 2016.
3. K.P. Soman, Shyam Diwakar and V. Ajay, Insight into Data Mining Theory and Practice, Eastern Economy Edition, Prentice Hall of India, 2006.
4. Ian H.Witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, Elsevier, Second Edition.
5. G. K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
6. Daniel T. Larose, "Data Mining Methods & Models", Wiley-India, 2007.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Data Warehousing and Mining (IJDWM), IGI Publication
2. International Journal of Data Warehousing (IJDW), Serial Publication
3. Code Magazine, Articles on Data warehousing and Data Mining, EPS Software Corporation
4. Journal of Data Mining in Genomics & Proteomics Open Access, Hindawi Publication

M-362: BIG DATA TECHNOLOGIES

OBJECTIVES
1. To define the basic concepts of big data.
2. To introduce the tools required to manage and analyze big data.
3. Develop skills to solve complex real world problems.

LEARNING OUTCOMES
1. Understanding of the concepts of Big Data.
2. Illustrate how to use tools to manage big data
3. Compare different tools used in big data analytics.
4. Apply MapReduce to solve problems.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Understanding Big Data:** Introduction, Need, Importance of Big data, Classification of Digital Data, Four Vs, Drivers for Big data, Big data Terminology, Industry examples and Top Challenges Facing Big Data, Responsibilities of data scientists, Technology Challenges for Big data, Convergence of key trends, Big data Architecture.	3
UNIT II	**Web analytics:** big data and marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, Open source technologies, cloud and big data, Crowd Sourcing Analytics, inter and trans firewall analytics.	3
UNIT III	**Introduction to Hadoop & Hadoop Ecosystem-I:** Introduction to Hadoop, Features of Hadoop, Hadoop Versions, Hadoop Architecture, Hadoop Ecosystem: Introduction to Hadoop Ecosystem, Introduction to Data Management and Data Access tools: Data Management using Flume, Oozie, Zookeeper; Hive, Pig, Avro, SQOOP for data access.	3
UNIT IV	**The Hadoop Ecosystem-II:** Introduction to Data Processing and Data Storage tools: MapReduce, YARN, HDFS, HBase.	3
UNIT V	**HDFS:** Intoduction to HDFS, HDFS concepts, NameNode, Secondary NameNode and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Design and working of Hadoop distributed file system (HDFS).	3
UNIT VI	**MapReduce:** Introduction, MapReduce workflows, Split, map, combine, scheduling, shuffle and sort.Problems & examples in MapReduce.	3
UNIT VII	**NO SQL Data Management:** Problem with Relational Database Systems. Introduction to NOSQL, Advantages of NOSQL, SQL versus NOSQL. Aggregate data models, key-value and document data models, relationships, graph databases, schemaless databases.	3
UNIT VIII	**Big data Applications:** Healthcare, Finance, Advertising, Marketing, Transportation, Education, Government, Cyber Security etc.	3

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICALCOMPONENT

1. Applying concepts of Web analytics, crowd sourcing analytics to solve real world problems.
2. Tracing the data flow through Hadoop Tools for tasks at hand.
3. Representation of HDFS ecosystem.
4. Solving problems using MapReduce.
5. How NOSQL solves the database problems for Big Data.
6. Exploring Big data applications in diverse domains.

BOOKS RECOMMENDED

1. Michele Chambers, Michael Minelli, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013
2. Anil Maheshwari, " Big Data", McGraw-Hill; Second edition, 2019
3. Subhashini Chellappan Seema Acharya, "Big Data and Analytics", Wiley, 2019
4. Arshdeep Bahga, Vijay Madisetti, "Big Data Analytics: A Hands-On Approach", VPT, 2018
5. Nandhini Abirami R, Seifedine Kadry, Amir H. Gandomi, Balamurugan Balusamy, "Big Data: Concepts, Technology, and Architecture", Wiley, 1st edition 2021
6. EMC Education Services, " Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", 2015

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Big Data, Springer
2. Big Data & Society, SAGE Journals
3. International Journal of Big Data Intelligence, Inderscience Publishers.
4. Big Data Research, ScienceDirect

M-363: BLOCKCHAIN TECHNOLOGIES

OBJECTIVES

1. Discuss and describe the history, technology, and applications of Blockchain.
2. Understand Blockchain and its main application Cryptocurrency.
3. Learn how this system works and how can it be utilized.

LEARNING OUTCOMES

1. Assess Blockchain applications in a structured manner.
2. Present Blockchain concepts clearly and persuasively.
3. Able to use cryptocurrency exchanges and wallets safely.
4. Gain familiarity with investing in Blockchain startups.

Section A

UNIT	COURSE DESCRIPTION	SESSIONS
UNIT I	**Introduction:** Need of Decentralized Ledger System, Advantage and Disadvantage of Centralized Trusted System, Security, Integrity and Privacy Issues of a Decentralized System, Main Barriers to Blockchain Adoption, Use of Blockchain technology.	3
UNIT II	**Technological and Cryptographic Elements in Blockchain:** Public Key & Private Key, Digital Signature & Hash Value, Real-life Scenario Challenges, Key Questions for Blockchain, Transactions, Modify Transactions, Maintain Transactions.	4
UNIT III	**Classification of Blockchain Platforms**: Trustlessness and Immutability of Blockchain Technology, Proof of Work and Proof of Stake, Token, Tokenizing Shares and Fund Raising, Hyperledger.	3
UNIT IV	**Risks and Limitations of Blockchain**: The Evil Sides of Blockchains: Ransomware, Money Laundering, Cyber Currencies.	3
UNIT V	**Cryptocurrency:** History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Side chain, Name coin	3
UNIT VI	**Cryptocurrency Regulation:** Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy.	3
UNIT VII	**Selection Criteria for Blockchain Applications**: Blockchain for Supply Chain Financing, Blockchains for Trade Finance, Permissioned Blockchains used in Enterprise Network.	3
UNIT VIII	**Blockchain Applications:** Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain	2

Section B

At least one Case Study from each UNIT Questions will be case/ inferences/ application based

PRACTICALCOMPONENT

1. Mining puzzles.
2. Hashcash implementation.
3. Go-ethereum.
4. Smart Contract Construction.
5. Toy application using Blockchain.

BOOKS RECOMMENDED

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, " Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, 2016.
2. Andreas M. Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media, Inc, 2014.
3. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger", Yellow paper Press, 2014
4. Paul Vigna & Michael J. Casey, " The age of cryptocurrency: How Bitcoin and the Blockchain Are Challenging the Global Economic Order", Picador, 2015 .
5. Don Tapscott, Alex Tapscott, "Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World", Notion Press, 2016.
6. David Lee Kuo Chuen, "The Handbook of Digital Currency", Academic Press, 2015.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Special Issue on Blockchain, Springer Open.
2. Making Smart Contracts Smarter, ACM.
3. International Journal of Blockchains and Cryptocurrencies, IJBC .
4. Advances in Blockchain Technology and Applications, MDPI.
5. Blockchain: Research and Applications , Elsevier.

RAJASTHAN TECHNICAL UNIVERSITY

KOTA

REVISED SCHEME & SYLLABUS

OF

FIRST YEAR

MBA

(EFFECTIVE FROM THE SESSION: 2020-21)

MBA

WITH DUAL SPECIALIZATION

IN

MARKETING

HUMAN RESOURCE

FINANCE

OPERATIONS & SUPPLY CHAIN

INFORMATION SYSTEMS

BUSINESS ANALYTICS

SCHEME OF MBA PROGRAM

1. The Master of Business Administration (MBA) is 4 semesters program. The Program structure and credits for MBA have been taken as per AICTE guidelines and model Scheme based on the stakeholders needs and general structure of the program.

2. Minimum number of classroom contact teaching credits for MBA is 96 credits and field work/ internship of 06 credits, thus the minimum number of credits for award of MBA course is 102 credits. Out of 96 credits, 54 credits are allotted for core courses and rest 42 credits for electives including laboratory work.

3. The following shall be the scheme for teaching and examination of MBA Course for academic session 2020-21. The teaching scheme is given in terms of number of sessions for a course/lab work. Each session is of 90 minutes. There will be 5 days teaching in a week.

FIRST SEMESTER MBA TEACHING SCHEME

SN	Course Type	Paper Code	Paper Title	No of Sessions		Credits	Internal	External	Total
				Per Semester	Per Week				
1	PCC	M-101	Fundamentals of Management	24	2	3	30	70	100
2	PCC	M-102	Managerial Economics	24	2	3	30	70	100
3	PCC	M-103	Operations Management-I	24	2	3	30	70	100
4	PCC	M-104	Marketing Management	24	2	3	30	70	100
5	PCC	M-105	Information Technology for Managers	24	2	3	30	70	100
6	PCC	M-106	Organizational Behavior	24	2	3	30	70	100
7	PCC	M-107	Cost and Management Accounting	24	2	3	30	70	100
8	PCC	M-108	Business Statistics and Analytics for Decision Making	24	2	3	30	70	100
9	MCC	MCC	AUDIT COURSE	12	1	0	30	70	100*
10	REW	M-109	Seminar on Contemporary Issues	24	2	1	60	40	100
11	PCC	M-110	Data Analytics Lab.	24	2	1	60	40	100
12	PCC	M-111	Business Communication Lab.	24	2	1	60	40	100
13	SODECA		Social Outreach, Discipline & Extra Curriculum Activities	-		1	-	100	100
			Total for I Semester	276	23	28	420	780	1200

***Note:** Marks of audit course will not be considered for credit purpose*

SECOND SEMESTER MBA TEACHING SCHEME

SN	Course Type	Paper Code	Paper Title	No of Sessions		Credits	Internal/ Minimum Marks	External/ Minimum Marks	Total
				Per Semester	Per Week				
1	PCC	M-201	Legal and Business Environment	24	2	3	30	70	100
2	PCC	M-202	Corporate Strategy	24	2	3	30	70	100
3	PCC	M-203	Quantitative Techniques	24	2	3	30	70	100
4	PCC	M-204	Financial Management	24	2	3	30	70	100
5	PCC	M-205	Human Resource Management	24	2	3	30	70	100
6	PCC	M-206	Marketing Research	24	2	3	30	70	100
7	PCC	M-207	Operations Management- II	24	2	3	30	70	100
8	PCC	M-208	New Enterprise and Innovation Management	24	2	3	30	70	100
9	MCC		AUDIT COURSE	12	1	0	30	70	100*
10	REW	M-209	Mini-Project	24	2	1	60	40	100
11	PCC	M-210	Business Ethics Lab.	24	2	1	60	40	100
12	PCC	M-211	Managérial Computing Lab.	24	2	1	60	40	100
13	SODECA		Social Outreach, Discipline & Extra Curriculum Activities	-		1	-	100	100
			Total for II Semester	276	23	28	420	780	1200

***Note:** Marks of audit course will not be considered for credit purpose*

4. The first year of the MBA Program provides the incoming students, a thorough grounding in the basic and functional disciplines and courses are delivered with managerial focus. The first-year courses in the core curriculum are common to all students, and are aimed at providing contextual understanding, conceptual knowledge, analytical skills, tools and techniques, social, cultural, and environmental sensitivity. This will enable them to enter any stream of management when they embark upon a career, regardless of the choice of specialization they make in the second year.

5. All first-year courses are compulsory. The duration of external examination for each paper would be 3 hours. The minimum passing marks in each course will be 40% in each individual component of internal and external separately. A student must obtain 50% marks in aggregate in individual course for qualifying and to obtain pass grade.

6. Laboratory Work:

6.1 M-109/M-110/M-210/M-211: There shall be regular assessment of students in which internal assessment would be done by the concerned teachers taking the lab. A batch of 60 students is to be divided into 4 groups of 15 students per group for conducting lab classes. Each group is assigned a teacher for conducting the lab and assessment of the students will be done by the teacher out of 60 marks. The assessment of 40 marks shall be done by the external examiner appointed by the Head of the department in consultation with Director/Principal of the college.

6.2 The sessional examination for M-109/M-110/M-210/M-211 shall be conducted at the end of semester before theory examinations and schedule shall be notified in the MBA timetable by the RTU.

7. The evaluation of academic performance is based on internal assessment of the following components The distribution of internal assessment marks will be:

SN	COMPONENT	MARKS
1	Term Test (Minimum two tests for each course)	10
2	Assignments/ Quiz/Case analysis	05
3	Project Work/ Term Paper	10
4	Class Participation and attendance	05
	TOTAL	30

8. A systematic record for the award of internal assessment marks shall be maintained in the department signed by the faculty member concerned and counter signed by the Head of the Department. This type of assessment shall be done for all the four semesters.

9. Seminar on Contemporary issues (M-109)

9.1 In first semester, the students are required to take seminar on contemporary issues. The faculty members will assign contemporary issues concerning with Indian Corporate sector like, merger & acquisition, current economic issues, global interface, stock market developments, new HR initiatives, recent trends in marketing trends etc, to the students.

9.2 The students will prepare seminar under guidance of faculty members allotted by the Director/ Principal /Head of Department of the institute. There will be regular internal assessment and regular classroom interactions as per the number of sessions allotted to it.

9.3 The student will submit written report of seminar work, prepared individually and shall make an oral presentation before a panel consisting of internal and external examiner (Preferably from Industry) appointed by Director/Principal/HOD. The assessment of 40 marks shall be done by the external examiner appointed by the Head of the department in consultation with Director/Principal of the college.

9.4 The average number of pages in the report shall be 40 and should be typed by student himself. The format of the report is to be provided to students by the institute.

10. Mini-Project (M-209)

10.1 The Student should be able to identify the issues and challenge of the industry and is able to prepare report on the application of emerging technologies in the selected industry.

10.2 In second semester, the students are required to take one industry as per his/her interest, for analysis and prepare a project report. Preference should be given on the application of emerging technologies in the selected industry.

10.3 The students will prepare project report under guidance of faculty members allotted by the Director/ Principal /Head of Department of the institute. There will be regular internal assessment and regular classroom interactions as per the number of sessions allotted to it.

10.4 The student will submit written report of project work, prepared individually, and shall make an oral presentation before a panel consisting of internal and external examiner (Preferably from Industry) appointed by Director/Principal/HOD. The assessment of 40 marks shall be done by the external examiner appointed by the Head of the department in consultation with Director/Principal of the college.

10.5 The average number of pages in the report shall be 40 and should be typed by student himself. The format of the report is to be provided to students by the institute.

11 Summer Training Work/Internship

11.1 Summer Training Project offers an opportunity to put learning into practice and it also serves as an important experiential channel for students to move towards finalizing their preferences on various specializations.

11.2 At the end of the second semester examination, it is mandatory for every student of MBA to undergo on-the- job practical training in any manufacturing, service or financial organization. The training will be of 6 to 8 weeks duration. The college/institute will facilitate this compulsory training for students.

11.3 During the training, the student is expected to learn about the organization and analyze and suggest solutions to a live problem. The objective is to equip the students with the knowledge of actual functioning of an organization and problems faced by them for exploring feasible solutions.

11.4 During the course of training, the organization (where the student is undergoing training) may assign a problem/project to the student.

11.5 The student, after the completion of training will submit a report to the College/Institute which will form part of the third semester examination. The report must be submitted by the end of September 30. The report (based on training and the problem/project studied) prepared by the student will be known as Summer Training Report. It should reflect in depth study of an organization where the student undergoes training.

11.6 One comprehensive chapter must be included about the organization where the student has undergone training. This should deal with brief history of the organization, its structure, performance products/services and problem faced. This chapter will form part 1 of the report. Part 2 of the report will contain the study of problem undertaken during training. The average size of report ordinarily will be of minimum 100 pages in standard font size (12) and double spacing. Two neatly typed (one sided only) and soft bound copies of the report will be submitted to the College/Institute. The report will be typed on A-4 size paper.

11.7 The report will have three certificates, one by the Head of the Department, another by the Faculty guide and third one from reporting officer of the organization where the student has undergone training. These three certificates should be attached in the beginning of the report.

11.8 The Summer Training Project Report carry 200 marks and will be evaluated by two examiners (external and internal). The evaluation will consist of (1) Project Report evaluation (2) Project Presentation and Viva Voce. The Project Report evaluation will comprise of 120 sessional marks and would be evaluated by internal project guide. The Presentation and Viva Voce would comprise of 80 marks and would be evaluated by two examiners (1 external and 1 internal).

11.9 The external examiner will be appointed by University from the panel proposed by BOS and approved by DEAN/HVC, RTU. **The concerned institute will bear the travelling, remuneration, DA and other incidental expenditure of external examiner with recourse to RTU.**

11.10 Only such person will evaluate the project report who has minimum three years of experience of teaching MBA classes in a College/University.

11.11 The parameters on which external evaluation would be carried out are as under:

Project Report External Evaluation: Evaluation Criteria					
SN	**Unsatisfactory**	**Satisfactory**	**Good**	**Excellent**	**Score**
	4	**8**	**12**	**16**	
1	Understanding of Objectives with topic				
2	Understanding of Reliance of topic				

3	Interpretation & Analysis					
4	Presentation					
5	Query handling					

11.12 It is mandatory that the student will make presentation in the presence of teachers and students. The student is expected to answer to the queries and questions raised in such a meeting.

11.13 The student shall prepare the Summer Training Report as per the format given in the Summer Training Manual as prescribed by the University

11.14 The students will also be required to submit a completed feedback form from these summer organizations.

12 The specialization once selected in third semester would continue in fourth semester also. The university shall offer following specialization in various functional areas:

A. Financial Management
B. Marketing Management
C. Human Resource Management
D. Operations and Supply Chain Management
E. Information Systems
F. Business Analytics

13 Audit Courses: In addition to the core and elective courses, students can take one audit course in each semester covering subjects of developing desired attitude among the learners. The enrolment in a such a course will permit a student to attend the without being evaluated for credit. These courses will be termed as MBA Common Courses.

College can offer any two audit courses per semester from the list of approve audit courses. The same can be facilitated through seminars, workshop, Industry visits, assignments, case studies, MOOC's platform.

MBA Common Courses (Audit Courses):	
SN	Course Title
1	English for Research Paper Writing
2	Disaster Management
3	Sanskrit for Technical Knowledge
4	Value Education
5	Constitution of India
6	Pedagogy Studies
7	Stress Management by Yoga
8	Personality Development through Life Enlightenment Skills
9	Indian Ethos and Business Ethics
10	Corporate Social Responsibility

RAJASTHAN TECHNICAL UNIVERSITY

KOTA

DETAILED SYLLABUS

OF

FIRST YEAR

MBA

WITH DUAL SPECIALIZATION

IN

MARKETING, HUMAN RESOURCE,

FINANCE, OPERATIONS & SUPPLY CHAIN,

INFORMATION SYSTEMS, BUSINESS ANALYTICS

EFFECTIVE FROM THE SESSION: 2020-21

M-101: FUNDAMENTALS OF MANAGEMENT 9
M-102:MANAGERIAL ECONOMICS 9
M-103: OPERATIONS MANAGEMENT - I 10
M-104: MARKETING MANAGEMENT 11
M-105: IT FOR MANAGERS 13
M-106: ORGANIZATIONAL BEHAVIOUR 13
M-107: COST AND MANAGEMENT ACCOUNTING 15
M-108: BUSINESS STATISTICS AND ANALYTICS FOR DECISION MAKING 15
M-109: SEMINAR ON CONTEMPORARY ISSUES 16
M-110: DATA ANALYTICS LAB 17
M-111: BUSINESS COMMUNICATION LAB 17
M-201: LEGAL AND BUSINESS ENVIRONMENT 18
M-202: CORPORATE STRATEGY 19
M-203: QUANTITATIVE TECHNIQUES 20
M-204: FINANCIAL MANAGEMENT 21
M-205: HUMAN RESOURCE MANAGEMENT 22
M-206: MARKETING RESEARCH 23
M-207: OPERATIONS MANAGEMENT II 24
M-208: NEW ENTERPRISE AND INNOVATION MANAGEMENT 25
M-209: MINI-PROJECT 26
M-210: BUSINESS ETHICS LAB 26
M-211: MANAGÉRIAL COMPUTING LAB 27
SOCIAL OUTREACH, DISCIPLINE & EXTRA CURRICULAR ACTIVITIES (SODECA) 28
Audit course: ENGLISH FOR RESEARCH PAPER WRITING 29
Audit course:: DISASTER MANAGEMENT 29
AUDIT COURSE: SANSKRIT FOR TECHNICAL KNOWLEDGE 30
Audit course: VALUE EDUCATION 30
Audit course: CONSTITUTION OF INDIA 31
Audit course: PEDAGOGY STUDIES 31

M-101: FUNDAMENTALS OF MANAGEMENT

OBJECTIVES
1. To familiarize students with the basic concepts, principles, and practices of management.
2. To gain an understanding of the historical development of management theories and the implications for the management of any organization.
3. To help students identify and imbibe the key competencies needed to be an effective manager and resolve any management problem when presented

LEARNING OUTCOMES:
1. Understand the history and concepts related to Business Management.
2. Demonstrate the roles, skills, and functions of management.
3. Apply knowledge of Principles and Practices of Management to diagnose and solve organizational problems and develop optimal managerial decisions.
4. Learn from the management practices of Business leaders, the art of management.

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Basic Concepts of Management:** Management an Overview- Concept, Functions, Scope and Significance of Management, Managerial Roles, Managerial Skills, Schools of Management Thought: Classical Perspective- Scientific Management, Administrative Management, Bureaucratic Management; Behavioral Perspective; Systems and Contingency Approach for understanding organizations.	4
II	**Contribution of Management Thinkers:** Kautilya, Peter Drucker, C.K. Prahlad and Herbert Simon.	3
III	**Fundamentals of Planning:** Essentials of Planning, Objectives, Strategies, Policies; Decision making.	3
IV	**Fundamentals of Organizing:** Organizing - Nature and purpose, Departmentation, Span of Management, Line and Staff authority, Centralization and Decentralization.	3
V	**Staffing:** Human resource Management and Selection, Selection Process, Techniques of Selection-Tests and Interviews.	2
VI	**Directing and Leading:** Effective Directing, Supervision, Leadership- Concept, Styles and Theories- Trait Theory, Behavioral Theories, Contingency Theories.	3
VII	**Controlling and Coordinating:** Control- Concept, Types and Process, Techniques of Controlling. Coordination- Concept, Importance, Principles and Techniques of Coordination.	2
VIII	**Management Practices of:** Dhirubhai Ambani, Narayan Murthy, Azim Premji, Ratan Tata, Steve Jobs, Bill Gates.	4

SECTION B

At least one Case study/Problem from each UNIT
Questions will be case/inferences/application based
PRACTICAL COMPONENT:

- Studying organizational structures of any 10 companies and classifying them into different types of organizations which are studied above and justifying why such structures are chosen by those organizations.
- Preparing the leadership profiles of any 5 business leaders and studying their leadership qualities.
- Conducting Role plays on each function of Management.
- Preparing presentations on management practices of business leaders.
- Assigning group tasks to be accomplished in stipulated time.

Note: Faculty can either identify the organizations / leaders or students can be allowed to choose the same.

BOOKS RECOMMENDED:

1 Weihrich, Heinz and Koontz, Harold. Management A Global and Entrepreneurial Perspective. McGraw Hill.
2 Koontz. Essentials for Management: An International Perspective. Tata McGraw-Hill.
3 Robbins, Stephen P., Decenzo, David, A. Essentials of Management. Pearson Education.
4 Bhat. Management: Principles, Processes and Practices. Oxford University Press.
5 PC Tripathi and PN Reddy, "Principles of Management", Tata McGraw-Hill, Fifth Edition.
6 Drucker, Peter. The Practices of Management. Allied Publishers.
7 James AF *Stoner*, R. Edward Freeman, Daniel R. Gilbert, "Management", Prentice Hall International.

LIST OF JOURNALS / PERIODICALS / MAGAZINES / NEWSPAPERS

1. Harvard Business Review
2. Vikalpa: The Journal of Decision Makers, Journal of IIM, Ahmedabad
3. SANKALPA: Journal of Management & Research
4. Business India / Business Today / Business World/Effective Executive

M-102:MANAGERIAL ECONOMICS

OBJECTIVES
1. To develop analytical skills related to economic theories in business contexts.
2. To analyze the demand and supply conditions and assess the position of a company.
3. To design competitive strategies according to the natures of products and the structures of the markets.
4. To formulate and apply the right economic tools for business decision-making.

LEARNING OUTCOMES:
1. Assess critically the main determinants of demand and supply of the firm.
2. Apply the tools of economic theory to explain optimal production and pricing decisions by the firm in each market structure.
3. Appraise emerging issues in economics at the national and international levels.

4. Analyze mechanism by which the total amount of resources possessed by a firmware allocated among alternative uses.

SECTION A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Introduction to Managerial Economics:** Managerial Economics: Meaning, Nature, Scope, & Significance. Relationship of Managerial Economics with Statistics.	3
II	**Fundamental Concepts:** Opportunity Costs, Incremental Principle, Time perspective, Discounting and Equi-Marginal principles. Theory of the Firm: Firm and Industry.	3
III	**Demand and Supply Analysis:** Theory and Law of Demand, Individual and Market Demand, Determinants of Demand, Concept of Elasticity of Demand, Types of elasticity of demand, Uses of elasticity of demand for Managerial decision making, Measurement of elasticity of demand. Concept of Demand Forecasting, Methods – Qualitative and Quantitative (basic concepts only). Supply – Law of Supply, Its determinants and Elasticity of supply.	3
IV	**Cost Analysis and Pricing Approach:** Cost - Concept and Types of Costs, Short Run Cost Analysis - Fixed, Variable, Total, Average and Marginal Cost Curves. Long Run Cost Analysis - Economies and Diseconomies of Scale, Factors affecting cost at Micro-level. Full cost pricing, Product line pricing, Product lifecycle pricing. Pricing Strategies: Price Skimming, Penetration Pricing, Differential Pricing, Promotional Pricing, etc.	4
V	**Production and Utility analysis:** Concepts, production function with one variable input - Law of Variable Proportions. Production function with two variable inputs and Laws of returns to scale. Consumer behavior and Surplus. Marginal Utility Analysis, Economies of scale.	4
VI	**Market structure and pricing practices:** Perfect Competition: Features, Pricing under perfect competition. Monopoly: Features, Pricing under monopoly. Price Discrimination. Monopolistic Competition: Features, Pricing under monopolistic competition, Product differentiation. Oligopoly: Features, Kinked demand Curve, Cartels, Price leadership.	2
VII	**Concepts of National Income, Index Number and Business Cycle:** National Income- Concept, GNP,NNP,GDP,PCI Methods and difficulties in Measurement of National Income. Review of index Number- Meaning, Importance and Limitations. Meaning and Features of Business Cycles, Phases of Business Cycles	3
VIII	**Profits**: Determinants of Short-term & Long-term profits. Classification - Measurement of Profit. Break Even Analysis - Meaning, Assumptions, Determination of BEA, Limitations, Uses of BEA in Managerial decisions.	2

SECTION B

At Least one Case Study from each UNIT. Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Assessing the Impact of Social Media on the demand of a product/Services.
- Mini project may be given to students to assess the long-term and short-term cost incurred for producing goods/services
- Considering an industry and analyzing its features, and pricing strategies implemented by any two rivalry firms.
- Considering an industry and critically analyzing the impactof COVID 19 on business cycle
- Preparing a project proposal for a new business venture to understand the BEP using real time data.

BOOKS RECOMMENDED:

1. D.N.Dwivedi, Managerial Economics, Vikas Publishing House, Eighth Edition.
2. D. M. Mithani, Managerial Economics - Theory and Application, Himalaya Publishing House, Eighth Edition.
3. Damodaran. Managerial Economics. Oxford University Press, second Edition.
4. Keat/ Banerjee, Managerial Economics: Economic Tools for Today's Decision Makers, Pearson Education, Seventh Edition.
5. Petersen, H. Craig., Lewis and Jain. Managerial Economics. Pearson Education, Fourth Edition.
6. Geetika, PiyaliGhosh, Purba Roy Chowdhury, Managerial Economics, McGraw-Hill Education, Third Edition.
7. Gillespie, Business Economics, Oxford University Press, Second Edition.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Margin- The Journal of Applied Economic Research
2. South Asia Economic Journal
3. Global Journal of Emerging Market Economics
4. Asian Journal of Management Cases
5. Economic Times Newspaper

M-103: OPERATIONS MANAGEMENT - I

OBJECTIVES

1. To acquire a set of skills and tools to improve Productivity to get competitive advantage through operations.
2. To comprehend planning, creation and management of resource capabilities used by a business to make services or products.
3. To analyze service operations system and its relationship with all other functions and activities in the organization.

LEARNING OUTCOMES:

1. Understand the different process technologies
2. Identify similarities and differences between products and services and basic manufacturing process.
3. Acquire the knowledge of Demand Forecasting and its techniques

4. Understand the importance of stores management and different techniques of inventory control.

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	Operations Management: Introduction, Scope of Operations Management, Operations Management and Decision Making, Historical Evolution of Operations Management, Key Issues for Today's Business Operations. Competitiveness, Strategy, and Productivity, Mission and Strategies, Operations Strategy, Implications of Organization Strategy for Operations Management , Productivity and its improvement	2
II	Demand Management and Forecasting; Need, objectives, Approaches to Forecasting, Qualitative and, Quantitative Methods, Forecasts Based on Time-Series Data, Associative Forecasting Techniques, Other Techniques: Focus Forecasting, Web-Based Forecasting-Collaborative planning, Forecasting, and Replenishment (CPFR). Accuracy and monitoring the forecast.	4
III	Product and Service Design: Introduction, Reasons for Product/ Service Design or Redesign. Idea Generation, Design Considerations, Strategies of Product or Service Life Stages, Degree of Standardization, Designing for Mass Customization, Phases in Product Design and Development, Designing for Production. Service Design: Overview.	2
IV	Capacity Planning: Introduction to capacity, Capacity Strategy, Defining and Measuring Capacity, determinants of effective capacity, developing capacity strategies, and evaluating alternatives. Cost-Volume analysis	2
V	Facilities Planning: Strategic Facilities Planning, Process Selection: Process Types, Product-Process matrix, Facility Location: Need for location decisions, Strategic Importance and Objectives. Factors affecting location, General Procedure for Making Location Decisions, qualitative and quantitative techniques of location analysis.	3
VI	Facilities Layout: Product, Process, Fixed Position, and Cellular layouts, Service Layout, Designing Product Layouts: Line Balancing, Designing Process Layouts, Systematic Layout planning, Materials Handling	3
VII	Planning levels: long range, Intermediate range and Short-range planning, Aggregate planning: Objective, Strategies, and techniques of aggregate planning. Master scheduling; Bill of materials, MRP; inputs processing and outputs, and overview of MRPII , use of MRP to assist in planning capacity requirements, Introduction to ERP	4
VIII	Inventory Control: The Nature and Importance of Inventories, Functions and Objectives, Inventory Costs, Inventory Ordering Policies, Economic Order Quantity Models, Basic Economic Order Quantity (EOQ) Model, Economic Production Quantity (EPQ), Quantity Discounts, Reorder Point Ordering, Shortages and Service Levels, Fixed-Order-Interval Model, Single-Period Model, Continuous Stocking Levels, Discrete Stocking Levels, Selective Inventory control techniques.	4

SECTION B

At least one Case Study from each UNIT. Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Visit any industrial unit and understand the processes performed in the unit.
- Use the theoretical knowledge to understand the operations.
- Prepare a report on how the above concepts used in selected industrial unit under the guidance of your subject teacher.
- Practical Assignment on calculating EOQ of a manufacturing company
- Collect data for identifying forecasting techniques of five national brands
- Student Groups may carry out a project work by visiting industrial unit/plant to demonstrate the application of principles of operations and submit written report/make presentation using infographics/Video.

BOOKS RECOMMENDED:

1 Chase, R. B. et al., Operations and Supply Management, Tata McGraw-Hill, 2010.
2 Blanchard, David., Supply Chain Management Best Practices, NY, John Wiley & Sons, 2006.
3 Stevenson. Operations Management with Student DVD (SIE). Tata McGraw-Hill.
4 Russell & Taylor, III. Operations Management. Prentice Hall of India.
5 Nair. Production and Operations Management. Tata McGraw-Hill.
6 Govil, M., and Proth, J., Supply Chain Design and Management, Academic Press, 2001.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Supply and Operations Management (IJSOM)
2. Operations and Supply Chain Management:(OSCM)
3. Journal of Operations and Supply Chain Management (JOSCM)
4. International Journal of Operations & Production Management(IJOPM)
5. International Journal of Supply Chain Management (IJSCM)

M-104: MARKETING MANAGEMENT

OBJECTIVES

1. To learn various dimensions of Marketing Management, Concepts and Applications.
2. To understand analytical perspectives, management decision tools for Planning, designing & implementing marketing strategy.
3. To have right understanding of consumer motivation and expectations.

LEARNING OUTCOMES:

1. Develop strong conceptual knowledge in the functional area of marketing management.
2. Analyze consumer markets, identify market segments, targets and craft the brand positioning.

3. Apply analytical skills in developing right marketing strategies and plans.
4. Devise effective product, pricing, promotion and placing strategies after environmental scanning for creating long-term loyalty relationships.

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Introduction:** Concept and Scope of Marketing, Philosophies of Marketing Management, Elements of Marketing - Needs, Wants, Demands, Customer, Markets and Marketers; Marketing Vs. Selling, Marketing – Mix, The Modern Components of the Mix- The Additional 3Ps, Holistic Marketing Concept. Co-Creation and Customer Engagement concept.	3
II	**Marketing Environment & Marketing Strategy:** Marketing Environment: Internal and External, Factors Affecting Marketing Environment, Functions of Marketing Management, Strategic Marketing Planning, Managing and controlling marketing program	3
III	**Segmentation, Targeting and Positioning:** The STP process, Concept of Market Segmentation, Benefits of Market Segmentation, Requisites of Effective Market Segmentation, Process of Market Segmentation, Bases for Segmenting Consumer Markets, Targeting strategies, Positioning concept and strategies.	3
IV	**Consumer buying behavior:** Introduction, Characteristics, Types of Buying Decision Behavior, Factors influencing Consumer Buying Behavior, Buying Decision Process, Buying Motives, Buyer Behavior Models	3
V	**Product Management-Brand and Branding Strategy:** Key concepts, Levels of Products, Classification of Products, Product Hierarchy, Product Line Strategies, Product Mix Strategies, Packaging and Labeling, New Product Development process, Product Life Cycle (PLC) – Stages and strategies, concept of a brand, brand elements and types	3
VI	**Pricing and Channel Decisions :** Pricing Objectives, Policies, Methods of Setting Price, Pricing Strategies, Distribution Channel Management, Member channel functions, Factors Affecting Channels of Distribution, Distribution channels design strategy, Introduction to logistics management, Current Trends in Wholesaling and Retailing. B2B, B2C	3
VII	**Integrated Marketing Communication:** Role of Marketing communications mix, Marketing Communications Tools- Advertising, Sales Promotion, Personal Selling, Public Relations, Direct Marketing, Social Media Marketing, Marketing Communications Planning,	3
VIII	**Evaluating Marketing Performance and Recent Trends in Marketing:** Marketing Strategy Implementation and Tools of measuring marketing performance- annual plan control, profitability control, efficiency control and strategic control., Introduction to importance of Data Analytics in Marketing Strategies, Customer Relationship Marketing, Digital Marketing, Sustainable marketing, Rural Marketing. Introduction to Global Marketing, Incoterms and its types	3

SECTION B

At Least one Case Study from each UNIT. Questions will be case/inferences/application based

PRACTICAL COMPONENT

1. Students should choose three companies- FMCG, Consumer Durable and Service Company and study their marketing-mix variables, customer retention strategies and innovative marketing strategies for enhancing customer engagement with the company brands.
2. Students are expected to visit and explore website of three of their preferred brands to identify the Segment & Target customer, Positioning strategy and effectiveness of their marketing strategies in making them popular.
3. Using smartphone or any other recording device students are expected to make a short video (12-15 mins duration) covering marketing-mix strategy (Product, Price, Place, Promotion) of a recently launched new product.
4. Students have to visit a Retail store targeting young people (for example Cafe Coffee Day, Benetton, Shoppers Stop, Adidas, etc). and make observations and assessment on the following:
   (a) Target market and strategic location of the store
   (b) Length and breadth of the store's product assortments
   (c) Internal and external atmospherics of the retail store (Lighting, décor, music, colour, spaces etc.)
   (d) Services offered by the store(limited service or full service)
   (e) Role of Personal Selling in the store
5. Selecting one television advertisement and one print advertisement students will describe the television and print advertisements in their assignment and answer the following questions:
   (a) Objective of both advertisements and the highlighted USP
   (b) Type of appeals (rational, emotional, moral) and execution-styles used in the advertisements
   (c) Target customer and media selection decision.
   (d) As creative and media planner for these brands what would be their suggestions regarding creative strategy, selection of media type, vehicle, timing etc.

BOOKS RECOMMENDED:

1. Kotler, P. T., & Armstrong, G. (2017). Principles of Marketing, Global Edition.
2. Chernev Alexander (2019) Strategic Marketing Management - The Framework, Cerebellum Press.
3. Dr .G. Bhuvaneshwari, Dr .S. Ramachandran (2018). Marketing Management, Airwalk Publications.
4. V S Ramaswamy (2017).Marketing Management: A Strategic Decision Making Approach, McGraw Hill Education
5. Michael J Etzel, Bruce J Walker, William J Stanton, Ajay Pandit, (2017). Marketing, 14e, McGraw Hill Education.
6. David A. Aaker& Amp; Damien McLoughlin; (2017). Strategic Market Management; John Wiley & Sons (Asia) Pvt. Ltd.
7. Baines, P., Fill, C., & Page, K. (2013). Essentials of marketing. Oxford University Press.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Marketing (USA)
2. International Marketing Review
3. International Journal of Online Marketing
4. Indian Journal of Marketing,
5. Marketing Master Mind, Etc.

M-105: IT FOR MANAGERS

OBJECTIVES

1. To acquire fundamental knowledge essential to manage Information technology functions successfully within an organization.
2. To define Information System from both a Technical and Business perspective.
3. To understand knowledge representations methods and IT Techniques as strategic tools to make business more competitive.

LEARNING OUTCOMES:

1. Apply frameworks and management principles to cope up with challenges inherent in rapidly advancing technology.
2. Design, plan, analyze, budget and propose technical requirement that impact the performance of business process to create a competitive edge.
3. Apply knowledge and evaluate the role of Information Technology in supporting various levels of Business strategy.
4. Access and interpret the relationship between Organizations, Information Systems and Business Processes.

SECTION A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Business value of telecommunication networks:** The basics of doing business on the Internet- the Internet revolution - the business value of Internet, Intranet and Extranet. Introduction to Web page Design. Creating Web Pages using HTML. Introduction to Cloud Computing.	4
II	**Information Systems (IS):** Concept of Data and Information, Kinds of Information Systems (IS); Elementary study of: Operations Support System (OSS), Transaction Processing System(TPS),Process Control System(PCS), Management Information System(MIS), Decision Support System(DSS). Artificial Intelligence (AI), Neural Networks, Expert Systems (ES).	3
III	**Developing MIS Systems:** System Development Life Cycle, Investigation Phase, Prototyping, Feasibility Analysis, System Analysis(DFD and ER Diagram), System Design, Implementing Business Systems, Testing, Documenting, Training and Maintenance.	4
IV	Data Organization issues, Exposure to Database Management System and SQL, Fundamentals of Data Warehouse and Data Mining for Decision Support	3
V	**e-Business and e-Commerce:** E-Business systems: e-Business models - Enterprise e-Business systems -E-Commerce systems – essential-Commerce processes - electronic payment processes - e-commerce application trends - Web store requirements, m-commerce.	3
VI	**IT application in business:** Functional business systems - cross-functional enterprise systems - Enterprise resource planning (ERP) - Customer relationship management (CRM) and Supply chain management (SCM).	4
VII	**Management challenges:** Security and Ethical Challenges of IT, Ethical Responsibility - Business Ethics, Technology Ethics; Cyber Crime and Privacy Issues.	3

SECTION B

At least One Case study/ Lab session for each UNIT. Questions will be inferences/application based

PRACTICAL COMPONENT

- Students should see actual/virtual assembling of a computer system.
- Considering an organization of repute study, the Management Information system of the organization.
- Develop MIS for small business application

BOOKS RECOMMENDED:

1. Kumar, K. And Rajkumar, S. Computer Applications in Business. Tata McGraw-Hill.
2. Lucas.Information Technology for Management. Tata McGraw-Hill.
3. David Cyganski, John A. Orr, Richard F. Vaz, Information Technology: Inside and outside, Pearson.
4. Laudon K C and Laudon J P., Rajanish Dass., Management Information Systems: Managing the Digital Firms, Pearson.
5. Stair, Ralph. M. Reynolds, George. Reynolds, George. W., Principles of Information System. Cengage Learning.
6. Murdick, Ross &Claggett. Information Systems for Modern Management Prentice Hall of India.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. CIS Communications, Computer Society of India.
2. MIS Quaterly, University of Minnesota.
3. Journal of Management Information System (Taylor & Francis Online)
4. Journal of Information System & e-Business management (Scimago Journal)
5. IGI Global (International Journal of E-Business Research)

M-106: ORGANIZATIONAL BEHAVIOUR

OBJECTIVES

1. To facilitate the development of a perspective to diagnose & effectively deal with the issues of human behavior in organizations.

2. To enhance understanding of the dynamics of interaction and integration between the individual and the organization.
3. To explore the organization system in totality to capture the full complexity of organizational behavior.

LEARNING OUTCOMES:

1. Analyze the behavior of individuals and groups in organizations in terms of the key factors that influence organization behavior.
2. Critically evaluate the potential effects of important developments in the external environment on organizational behavior.
3. Analyze organizational behavioral issues in the context of organizational behavior theories, models, and concepts.
4. Manage conflict in organizational context and deal with stress.

SECTION A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Concept of Organizational Behavior:** Models of Organizational Behavior, Emerging issues in organizational behavior, International OB: An Introduction to Individual & Interpersonal Behavior in Global Perspectives.	2
II	**Perception and Attribution:** Concept, Nature, Process, Importance. Management and behavioral Applications of Perception, Attribution theory.	3
III	**Attitude:** Concept, and Importance, Attitude Measurement. Attitudes and Workforce Diversity.	2
IV	**Personality and Learning:** Concept, Nature, Determinants of Personality, Freuds psychoanalytical theory of personality. The Myers-Briggs Type Indicator model of personality, The Big five model of personality, traits of personality, Concept and Theories of Learning	3
V	**Motivation:** Definition, Nature and Importance, Basic Content & Process Theories of Motivation-,Maslow's Hierarchy of Needs Theory, Herzberg's Motivation-Hygiene Theory, Alderfer's ERG Theory, Mc Clelland's Achievement Motivation Theory, Cognitive and Behavioral theories- Expectancy, Equity, Goal-Setting theories.	4
VI	**Group Dynamics:** Transactional Analysis, Group Dynamics: Concept, Definition, Stages of Group Development, Group Cohesiveness, Types of Groups, Group Decision Making,	3
VII	**Organizational Power, Culture and Change: Power**: Concept, Sources of Power, Distinction between Power, Authority and Influence, Approaches to Power. **Organization Culture**: Concept, Characteristics & Importance of Culture. **Organizational Change**: Concept, process and managing change.	4
VIII	**Conflict and Stress Management**: Conflict: Concept, Sources, Types of Conflict, approaches to conflict, Levels of conflict: Intra, Individual, Interpersonal, and Intergroup, Conflict management techniques. **Stress**: Understanding Stress Management and Its Consequences, Causes of Stress, Managing Stress	3

SECTION B

At Least one Case Study from each UNIT. Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Preparing the leadership profiles of any 5 business leaders and studying their behaviours with respects to the trait, behavioural and contingency theories studied.
- Identifying any five job profiles and listing the various types' abilities required for those jobs and also the personality traits/attributes required for the jobs identified.
- Students will be divided into groups of four to five members. The group's task will be to use concepts from the course to identify, analyze, and develop a plan for resolving a key problem that an organization is facing. The goal of this assignment is to analyze and apply OB concepts in a real organization.
- The key elements of motivation are intensity, direction and persistence. Based on these elements various motivation theory have been proposed. Compare the application of different motivational theories within the identified local organization to study using interviews, observations, and/or surveys.
- Based on learning of the concept of perception, conduct a study among managers in an organization to find out the impact of perceptual errors on perceptual interpretation.
- Study the various sources of stress across different levels in an organization. Identify individual and organizational strategies adopted to cope with stress. Suggest changes that could be brought into handle the stress more effectively in the organization.
- Stress Management: Workshop on Stress Management and importance of Yoga and Meditation for mental health

BOOKS RECOMMENDED

1. Stephen P. Robbins, Timothy A. Judge, Neharika Vohra, Organization Behavior, Pearson Education, 18th Edition, 2019.
2. Ashwathappa, K., Organizational Behavior, Himalaya Publication, 12th Edition 2019.
3. Fiona M. Wilson, Organizational Behavior and Work, Oxford University Press, 5th Edition, 2018.
4. Robbins & Judge, Essentials of Organizational Behavior, 14th edition, Pearson Education 2017.
5. Shashi K. Gupta, Rosy Joshi, Organisational Behavior,10th Edition, Kalyani Publication, 2017.
6. Suja Nair, Organisational Behavior-Text & Cases, Himalaya Publication, 2017.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Harvard Business Review, Harvard University.
2. Vikalpa, The Journal of decision maker, Sage publication.
3. Journal for Organisation Behaviour, Wiley online library.
4. Research in organization behavior, Elsevier.
5. Organisation Behaviour & Human resource magazine, Brock university library.

M-107: COST AND MANAGEMENT ACCOUNTING

OBJECTIVES
1. To inculcate an ability of preparing the financial statements of a business organization.
2. To develop the ability of performing analysis and deriving the interpretation from financial statements using different techniques of financial statement analysis.
3. To develop an orientation towards standards of accounting practices accepted and adopted at international level under IFRS.

LEARNING OUTCOMES:
1. Understand and describe management accounting.
2. Critically analyze and provide recommendations to improve the business operations using accounting techniques.
3. Identify problems associated with relying on financial accounting information for internal decision making.
4. Apply managerial accounting and its objectives in a way that demonstrates a clear understanding of ethical responsibilities.

SECTION A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Introduction to Accounting:** Need and Types of Accounting, Users of Accounting, concepts and conventions of Accounting, Accounting Equations.	2
II	**Elementary Preparation of Books of Accounts:** Journals, ledgers and trial balance. Final Accounts, Trading, Profit Loss account without adjustments, Balance Sheets	5
III	**Financial Statements preparation, analysis and Interpretation:** Income statement, Comparative, common size statements, Analysis techniques- Ratio Analysis, Cash flow Statement analysis as per AS3 and Fund flow statement analysis	5
IV	**Cost Accounting -An Introduction:** Concept, classification and Elements of Cost, Cost Sheet, Basics of Marginal costing	3
V	**Standard Costing**: Introduction, Material Variances only **Budgetary Control** – Concept, Types and Formats with basic calculations	3
VI	**Accounting Standards and Introduction to IFRS:** IFRS and proposed changes in Indian Accounting Standards.	2
VII	**Emerging issues in Financial Accounting :** Introduction to **Human Resource Accounting**, Responsibility Accounting and Basic concept of GST	2
VIII	**Valuation:** Valuation of goodwill, Inventory Management (LIFO, FIFO and HIFO methods)	2

SECTION B

At least One Case Study from each module. 50% of the Questions will be Numerical & Cases/Inferences based.

PRACTICAL COMPONENT:

- Study published financial statements of any three NSE listed companies and draw inferences and interpret the results.
- Prepare journals, ledgers and trial balance of any two companies of your choice.
- Prepare the statement of changes in the financial position of any two firms and comment.
- Study and report on any three companies following Responsibility Accounting.
- Do a ratio analysis of any two BSE listed companies and interpret results.

Books Recommended:

1 Anthony, Hawkins & Merchant, Accounting: Text and Cases, Tata McGraw Hill Education, 2010.
2 M Y Khan& P K Jain, Managerial Accounting, Tata McGraw Hill Publication,6th Edition, 2017.
3 Narayanaswamy R., Financial Accounting: A Managerial Perspective, PHI, 6th Edition, 2017.
4 Ravi M Kishore, Advanced Cost Accounting & Cost Systems, Taxmann's Publication,6th Edition 2016 .
5 Vijay Kumar, Accounting for Management, McGraw Hill Publication,4th Edition, 2010.
6 Anthony, Hawkins, Merchant, Accounting: Text and Cases, Tata McGraw Hill Publication,12th Edition 2015.
7 Ramachandran & Kakani, Financial Accounting for Management, Tata McGraw Hill, 4th Edition, 2016.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/ARTICLES:

1. Journal of International Financial Management and Accounting.
2. Journal of Management Accounting Research.
3. Accounting and Business Research.
4. Accounting, Auditing & Accountability Journal.
5. Accounting Horizons.

M-108: BUSINESS STATISTICS AND ANALYTICS FOR DECISION MAKING

OBJECTIVES
1. To familiarize with basic mathematical and statistical techniques and their applications in managerial decision making.
2. To develop understanding for managerial implications of the mathematical techniques.
3. To understand significance of measures of central tendency, symmetrical and asymmetrical distribution, patterns.

LEARNING OUTCOMES:
1. Use of matrices for solving business problems.
2. Statistically analyze business data using various tools.
3. Apply distribution techniques in business context.
4. Carry out basic Investment Analysis

SECTION A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Matrices and Determinants:** Definition of a matrix, types of matrices, algebra of matrices, Transpose, Adjoint, Inverse of a matrix.	2
II	**Business Applications using Matrices:** Solving linear equations by using matrices, Input-Output analysis. Application of matrices for solution to simple business and economic problems.	3
III	**Descriptive Statistics:** Measures of central tendency and dispersion and their implications, Mean, Mode, Median, Variance and standard deviation and Coefficient of Variation, Z Score, Exploratory data analysis, Box and Whisker Plot	3
IV	**Correlation:** Covariance and coefficient of correlation. Visual explorations using software like Microsoft Excel/MINITAB etc.	3
V	**Regression:** Types of Regression models, determination of simple linear regression equation using least square method, coefficient of determination, Overview of Partial and Multiple regressions.	3
VI	**Index Numbers:** Meaning, Types of index numbers, uses of index numbers, Construction of Price, Quantity and Volume indices: Fixed base and Chain base methods. Fisher ideal index number. Ration and Proportion.	3
VII	**Probability:** Basic probability concepts, conditional probability, marginal probability, and its uses in business decision making; Bayes' theorem and its applications. Probability Distributions: Concept and application of Binomial, Poisson, Exponential and Normal distributions	4
VIII	Investment Analysis: Interest: simple, compound, nominal and effective rate of interest. time value of money, discounting. Annuity, amortization and sinking funds. Breakeven Analysis.	3

SECTION B

Note: 50% of the Questions will be Numerical & Cases/Inferences based.

PRACTICAL COMPONENT:

- Identifying a business problem and solving it using matrices & determinants.
- Illustrate practical usage of Index Numbers
- Analyzing relationship between different probability distributions
- Understanding managerial implications of correlation & regression
- Conducting investment analysis of five individual investors

BOOKS RECOMMENDED:

1 Doane. Applied Statistics in Business and Economics. Tata McGraw-Hill.
2 Aczel. Complete Business Statistics, Tata McGraw-Hill.
3 Gupta, S.P. Statistical Methods. Sultan Chand & Sons.
4 John C. Lee., Business and Financial Statistics Using Minitab 12 and Microsoft Excel 97. World Scientific Publisher
5 Sharma, J.K.., Business Mathematics, Theory and Application, Ane Books India.
6 Francis Andre, Ben Mousley,Business Mathematics and Statistics (2014), Cengage Learning
7 C. R. Kothari, Quantitative Techniques, Vikas Publishing House, 2009.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/ARTICLES:

1. Proceedings of the Indian Academy of Sciences: Mathematical Sciences
2. Journal of the Ramanujan Mathematical Society
3. Journal of the Indian Mathematical Society
4. Sankhya: The Indian Journal of Statistics
5. Journal of Applied Statistics

M-109: SEMINAR ON CONTEMPORARY ISSUES

1. In first semester, the students are required to take seminar on contemporary issues. The faculty members will assign contemporary issues concerning with Indian Corporate sector like, merger & acquisition, current economic issues, global interface, stock market developments, new HR initiatives, recent trends in marketing trends etc, to the students.
2. The students will prepare seminar under guidance of faculty members allotted by the Director/ Principal /Head of Department of the institute. There will be regular internal assessment and regular classroom interactions as per the number of sessions allotted to it.
3. The student will submit written report of seminar work, prepared individually, and shall make an oral presentation before a panel consisting of internal and external examiner (Preferably from Industry) appointed by Director/Principal/HOD. The assessment of 40 marks shall be done by the external examiner appointed by the Head of the department in consultation with Director/Principal of the college. University shall not appoint any examiners for M-109.
4. The average number of pages in the report shall be 40 and should be typed by student himself. The format of the report is to be provided to students by the institute.

M-110: DATA ANALYTICS LAB.

OBJECTIVES To equip the students with an understanding of the, tools like MSEXCEL/Solver, LINGO /SYSTAT /R/SAS/MINITAB/Design Expert etc to facilitate managerial decision making.

LEARNING OUTCOMES: Use software's like MSEXCEL/Solver, LINGO /SYSTAT /R/SAS/MINITAB/Design Expert for taking managerial decisions.

SN	DETAILS OF LAB WORK
1	To use the following basic features of MSECXEL using the given dataset: Essential shortcuts, Paste Special (Value, Transpose), Absolute & Relative referencing. Data Analytics using Excel: Sort & Filter, SUBTOTAL, SUMIFS, COUNTIFS, Pivot Table for multivariable analysis, Computations, Sum, Max, Min, Average, Count.
2	To use the following advanced features of MSECXEL using the given dataset: Generating multiple reports, VLOOKUP, HLOOKUP, IF, Nested IFs, AND, OR etc. Data Cleaning and MIS reporting: LEFT, RIGHT, MID, UPPER, PROPER, LOWER, TRIM, Find & Replace, Go To Etc. MIS reporting: Automatic row-wise Subtotal, Conditional Formatting, File Password Select Dashboard Techniques, Grouping, Hide-Unhide Columns & Rows etc
3	To develop tables and charts for categorical and numerical data: Bar Chart, PIE Chart, Pareto Diagram, Steam and Leaf display, Frequency distribution, Histogram, Scatter plot and Time Series plots for the given dataset.
4	To compute the numerical descriptive statistics, covariance and coefficient of correlation for the given raw data and to construct Box and Whisker plot
5	Data Execution: Data Exporting, Data Validation, Data Analysis, V-Lookup, Data Segregation, creating a Pivot Table, working with Pivot Charts, Advance Statistical Functions
6	To construct contingency table, compute conditional, marginal probability and use Bayes theorem for the given data and interpret results
7	To construct the distribution plot for discrete distribution and continuous distribution probability distributions and infer results.
8	To compare the characteristics of data with theoretical properties of Normal distribution and to construct the normal probability plot
9	To carry out break even analysis using Excel's Goal Seek feature for the given problem.
10	Case Study on Demand Forecasting
11	To compute PV, NPV, XNPV, EMI, term of loan, IRR and infer the result for the given data set.

Note: The above list is suggestive. Experiments/case studies may be added relevant to the theory courses taught in the semester

BOOKS RECOMMENDED:

1. Stephen L. Nelson, Elizabeth C. Nelson "Microsoft Excel Data Analysis For Dummies, 2018 , Wiely
2. MacInnes, J. (2016), "An Introduction to Secondary Data Analysis with IBM SPSS Statistics", Sage Publishing.
3. Maheshwari, A. (2017), "Data Analytics", McGraw Hill Education.
4. Manohar Hansa Lysander, "Data Analysis and Business Modelling Using Microsoft Excel Paperback – 1", January 2016, PHI
5. Mize Edward, " Data Analytics: The Ultimate Beginner's Guide to Data Analytics", 2019, Venture Ink

M-111: BUSINESS COMMUNICATION LAB.

OBJECTIVES
1. To understand the fundamentals and importance of communication for managers.
2. To prepare students to acquire necessary communication skills required for better effective performance.
3. To enhance soft skills that are important to achieve goals.

LEARNING OUTCOMES:
1. Learning key principles of effective business communication and business etiquette.
2. Effectively solving problems and making good decisions
3. Developing and delivering business presentations
4. Collaborating in business with team and cross-functional teams

SN	DETAILS OF LAB WORK
1	**Introduction:** Business Communication-Process, Barriers to Communication, the Importance of Communication at Workplace, Applying 7 C's of communication. **Practice:** Describing about personal life and work life, one way and two-way communication and understand the various communication barriers, noise, filters. Select a text-based data (e.g., a newspaper article, a story, etc.) and analyze the effectiveness of 7 C's of communication.
2	**Oral Communication:** Paralanguage - appropriate use of Voice, tone, pauses and vocabulary. Elevator Speech. Practice: creating an outline for a short (30 to 90 second) Elevator Speech to introduce yourself
3	**Written Communication:** Introduction, need, significance and practice of: a) Cover Letters/Business letters b) Preparation of CV/Resume, c) Email writing and etiquette, d) Social Media writing e) Write your own one-page resume, Cover Letters/Business letters etc.
4	**Written Communication:** need, significance and practice of: **a)** Memo **b)** Circulars **c)** Press Release
5	Communication Media Etiquette: Telephone, Mobile, E-mail, social settings etc. a) To practice etiquette using communication media by using Role Plays b) To discuss do and don'ts while interacting on communication media.

6 **Group Discussion:** Practicing Mock Group Discussions, types of GD's, Applying leadership skills in a GD. Goal Setting. Conduction of Group Discussion on any topic.

7 **Art of Presentation:**
   a) To discuss the various elements of effective presentation, Designing Content, Use of creative ideas and interesting audio-visual aids, impressive grooming as per occasion – appearance, posture and gestures, Handling Stage fear and anxiety, Practicing delivery of presentation.
   b) **Practice:** Initial Planning, Preparation and Handling questions. To make effective use of Power Point Presentation demonstrating the use of animation, effects, hyperlinks, and productivity tools etc., Each student is required to give presentation of 5 minutes (this can be spread throughout the semester) and to be evaluated by the faculty

8 **Teamwork:**
   a) Discuss the elements of teamwork, stages of team formation, essential building block of effective teams
   b) To perform the given exercise on team building.

9 **Employability Skills:**
   a) Account creation on various social Media Platforms for employability and Networking,
   b) Getting ready for interview: First Impression and Clothing styles; Practicing Mock interviews, types of interviews, creating first right impression while approaching interview panel, analyzing interview questions (FAQ)

10 **Business Etiquette and Success Abilities:** Business and social etiquette, Guidelines for a meeting, a workshop or a conference and common mistakes, Time Management Skills, Art of giving and receiving feedback, Identifying and mapping success habits from successful people.
   a) To demonstrate conduction of Online Meetings / Video conferencing with the help of Google Meet, WebEx, Microsoft Teams etc. in the class.
   b) To conduct a mock meeting of students in the class identifying an issue of their concern. The students should prepare notice, agenda, and minutes of the meeting.

11 **Case Analysis and Presentation:** A suitable case is to be selected and administered in the class sticking to all the guidelines of case administering and analysis.

12 **Group Activity:** Form Student groups and ask them to write a persuasive letter and proposal for an innovative product or service. Circulate the work from each group among all other groups and ask them to evaluate the letter and proposal in line with possible responses to a letter (pleased, displeased, neither pleased nor displeased but interested, not interested)

Note: The above list is suggestive.

BOOKS RECOMMENDED:

1. Murphy, Effective Business Communication, 7th edition, Tata McGraw-Hill.
2. Sethi, Anjanee, and Bhavana Adhikari. Fundamentals of Communication, McGraw-Hill Education, 2013
3. Kaul, Asha, Effective Business communication, Prentice Hall of India.
4. Chaturvedi, P. D. and MukeshChaturvedi, Business Communication: Concepts, Cases and Applications, Pearson Education.
5. Ludlow, Ron & F. Panton, The Essence of Effective Communication, Prentice Hall of India.
6. Sally Chew. Business Etiquette: An Essential Guide for Executives. Times Books, 1992
7. Thill, John & C. V. Bovee, Excellence in Business Communication, McGraw Hill.

M-201: LEGAL AND BUSINESS ENVIRONMENT

OBJECTIVES

1. To have practical knowledge of legal issues to become more informed, sensitive and effective business leaders.
2. To understand various micro and macro environmental forces that affect business decision making.
3. To comprehend emerging trends in business environment. Also, to understand the government policies and current issues in Indian perspective.

LEARNING OUTCOMES:

1. Realize the importance of creating general legal boundaries that define the regulation of business.
2. Evaluating the role of law in an economic, political and social context.
3. Analyze the interaction between External and Internal forces of business environment.
4. Assess the changing business environment of India.

SECTION A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Legal Aspect of Business:** Introduction to Business Laws- Business Management and Jurisprudence; structure of the Indian Legal Systems: sources of Law; Manager and Legal System.	1
II	**Law of Contract:** Meaning of Contract; Essentials of a Valid Contract; Nature and Performance of Contract; Termination and Discharge of Contract. Contract of Indemnity and Guarantee- Definition and Concept Basic Essentials of a valid contract of Indemnity and Guarantee, Difference between contract of guarantee and contract of indemnity, Contract of Bailment: Definition and essentials. Rights and Duties of bailer and bailee and Law of Agency: Definition, Kinds of agents, Rights and Duties of agent and principal only. Elements of Law relating to Sale of Goods: Essentials of a Contract of Sale; Sale Distinguished from Agreement to Sell & Doctrine of Caveat Emptor.	5
III	**Law relating to Business Organizations:** Partnership Act, 1932: Partnership and its essentials, Rights and Duties of Partners, Types of Partners, Registration of Firms, and Modes of Dissolution of firms. Elements of Company Law 2013: Meaning and Nature of Company, Incorporation of a Company, Concept of Memorandum of Association, Article of Association , Concept of Board of Directors, Company Meetings and Winding of Company.	3

IV	**Protecting the property of Business:** Introduction to Copyright, Trademark, Secret, Geographical Indications, and Legislation for Anti-competitive and Unfair Trade Practices. Alternate Dispute resolutions: Introduction to Arbitration or Conciliation. Introduction to Consumer Protection Act 2019: Formation & Working of Consumer redressal agencies.	3
V	**Business Environment:** Nature, Concept and Significance, Types of environment: economic and non-economic environment and their interaction, Environment scanning and its process, Interaction between internal and external environments, Emergence of Market Driven Economies, Essential of competitive economies, emerging sectors of Indian economy.	3
VI	**Liberalization, Privatization and Globalization (LPG):** Introduction of Liberalization, Privatization and Globalization (LPG) Assessment of LPG in India with respect to Financial, Automobile and FMCG. Current industrialization trends and industrial policy. Agriculture and Business Role of Agriculture in Economic Development, Dependence of Business on Agriculture, Business opportunities in the rural sector.	3
VII	**Economic and Monetary Policies of India:** Emergence of Micro, Small and Medium (MSME) enterprises and Role of Institutions Micro, Small and Medium enterprises in India, Role of SIDBI and other institutions. Public sector reforms and performance; public-private partnership Monetary policy, Fiscal policy, current inflationary position and their impact on business environment. Stock exchange, Commodity exchanges in India, the role of SEBI, IRDA, Pension, and Board of Financial Supervision. Trends in service sector growth; Role of RBI and various Banking reforms and challenges	3
VIII	**Globalization trends and challenges:** Foreign Trade and Global Trends - Foreign Trade Policy, Balance of payment and Balance of Trade, Exchange rate and competitiveness, foreign capital flows and foreign collaboration, FDI in India. India's competitiveness in the world economy.	3

SECTION B

At least one Case Study from each UNIT Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Students to collect prospectus, memorandum of association and articles of association of any two companies and present,.
- Students should select real life cases from Government and/or Corporate world, study the same and make presentation.
- Prepare an assignment on different business laws as applicable to managerial functions.
- Students should be divided in groups to select a firm from an industry and prepare report on various micro and macro environmental factors affecting the firm.
- Monitoring trends of FDI in a particular industry in India for five years and preparing a report.

BOOKS RECOMMENDED:

1. Kapoor G.K., Suri A. P. Corporate Laws, Taxmann Publications, Third Edition.
2. Ghosh ,B.N., Business Environment, Oxford University Press, First Edition.
3. Veena Keshav Pailwar, Business Environment, First Edition
4. Justin Paul, Business Environment Text & Cases, Tata McGraw Hill Publishing Co. Ltd., Fourth Edition.
5. Francis Cherunillam, Business Environment-Text and Cases, Himalaya Publishing House, Twelfth Edition.
6. A Comparative Study of Companies Act 2013 with Rules and Companies Act 1956 with Rules (2014)
7. Corporate Laws, The Companies Act 2013, Lexis-Nexis

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Company Law Journal
2. International Journal of Information Processing and Management
3. Journal of Strategy and Management
4. Business Standard Newspaper
5. Business World Magazine

M-202: CORPORATE STRATEGY

OBJECTIVES
1. To evaluate major concepts and techniques of strategic management.
2. To have an overview of issues relevant to corporate and business strategy.
3. To develop strategic decision-making skills.

LEARNING OUTCOMES:
1. Develop understanding of the key dimensions of strategic management.
2. Apply diagnostic and practical skills to analyze and evaluate a range of business situations.
3. Develop skills in generating alternative solutions to complex problem areas in various business settings,
4. Demonstrate understanding of the concept of competitive advantage and its sources.

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**INTRODUCTION OF STRATEGIC MANAGEMNT:** Strategic Management: introduction, nature & scope, need, strategic decision making. Strategic Intent through Vision and Mission Statements, Core Competencies of Business. Need for explicit mission, Components of mission statement, Formulation of mission & objectives and their specificity. Goals and Objectives of Business.	3
II	**Environmental Scanning:** Component of environmental scanning-SWOT analysis, Scanning of Socio economic, Technological, Political environment, Techniques for environmental analysis. Industry analysis: Porter's approach, Environmental threat & opportunity profile.	3
III	**Internal Environment Scanning:** Factors of internal analysis; Marketing & distribution. R&D & engineering, Production & operations, Finance & accounting, Corporate resources & personal factors, Analyzing strengths & weaknesses of enterprise (SWOT). Value chain analysis,	3

IV	**Strategy Formulation- Business Strategy:** Generic Business Strategies, Tactics for Business Strategies, Business strategies for different Industry Condition, Tools and Techniques for Strategic Analysis: Porter's Five forces Model of competition. SWOT analysis, McKinsey's 7's framework; GE-9 Cell Model, Bostan's Consultancy Model. Components of Competitor Analysis, Strategic Plan.	4
V	**Strategy Formulation- Corporate Strategy :** Grand Strategies –Stability, growth, retrenchment & combination strategies- Modernization, Diversification, Integration, Merger, Take-over and Joint Venture strategies, Turnaround – divestment and Liquidation strategies.	4
VI	**Strategy Implementation:** Nature of Strategic Implementation; Barriers to strategy implementation, Interrelationship of formulation and implementation Resource Allocation, Factors affecting resource allocation, Values, Ethics and strategy, Social Responsibilities and Strategic Management. Corporate Governance – Introduction & meaning, different stakeholders, ownership & management, governing board, governance issues, governance & strategic implementation.	4
VII	**Evaluation and Control:** An Overview and Nature of strategic evaluation and Control, Importance of Strategic Evaluation, Barriers in Evaluation, Strategic Control, Operational Control, Techniques of strategic evaluation and control.	2
VIII	International Strategy: Opportunities and Challenges of operating internationally, strategy in a global context, Multinational Corporation.	1

SECTION B

At least one Case study / Problem from each module. Questions will be case / inferences / application based

PRACTICAL COMPONENT:

- Analyzing Mission and Vision statements of any five companies and comparing them.
- Applying concept of Michael Porter's five forces model to any one industry (Retail/Infrastructure/FMCG/Insurance etc)
- Study of International strategies of any two companies.
- Preparing Environmental Profile of any two companies.
- Preparing presentation on corporate strategy of any one company of choice.

BOOKS RECOMMENDED

1. J. D. Hungerand T.L. Wheelen, Strategic Management and Business Policy, Pearson Education,N. Delhi.
2. Azhar Kazmi, Business Policy & Strategic Management, Tata McGraw Hill.
3. Thompson & Strickland, Strategic Management-Concepts and Cases; Tata McGraw Hill Publishing Co. Ltd. New Delhi
4. Garth Saloner, Andrea Shepard and Joel Podolny : Strategic Management, John Wiley & Sons.
5. John A. Pearce & R. B. Robinson, Strategic Management ,Strategy Formulation and Implementation, AIBT Publishers & Distributors, New Delhi
6. Ramaswamy and Namakumari, Strategic Planning Formulation of Corporate Strategy, MacMillan India Ltd. New Delhi
7. Budhiraja S Band Athreya MB,Casesin Strategic Management, Tata Mc Graw-Hill

LIST OF JOURNALS / PERIODICALS / MAGAZINES / NEWSPAPERS

1. Harvard Business Review
2. Vikalpa–A Journal for Decision Makers, IIM Ahmedabad
3. IIMB Management Review (IMR).
4. SANKAL PA: Journal of Management & Research(ISBN:22311904)
5. Business Standard/Economic Times/Financial Times/ Management Review

M-203: QUANTITATIVE TECHNIQUES

OBJECTIVES

1. To give an exposure to operations research techniques to support business decisions.
2. To understand simulation and its application in decision making

LEARNING OUTCOMES:

1. Apply quantitative tools in managerial decision making.
2. Apply decision theory for business decisions.
3. Effectively use simulation tool in relevant application areas.

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	Introduction to Quantitative Approaches to decision making, Classification of models, general method of solving quantitative models, Quantitative models in practice	2
II	**Linear Programming:** Structure of LP model, Assumption, Advantages, Limitations, General Structure of LPP, Model Formulation, of LP model, graphical method, simplex method. Application to production, marketing, agriculture etc., Introduction to Duality.	4
III	**Transportation and Assignment models:** Transportation problem, General structure of transportation problem, methods of finding initial basic feasible solution (NWCM, LCM & VAM), test for optimality (MODI Method), degeneracy, Assignment problems, Introduction, General structure, Hungarian method of solution, variations of assignment problems: minimization, maximization, unbalanced cases and restrictions	4
IV	**Decision Theory: D**ecision-making under uncertainty- Maximin, Maximax, Laplace and Hurwicz criteria; decision-making under Risk- Expected Value (EMV, EOL,EVPI), decision tree analysis	3
V	**Game Theory:** Theory of games- formulation of game models, Two person Zero sum games & their solution, 2 x N and M x 2 games, pure strategies with saddle point, rule of dominance, solution methods for games without saddle point: Mixed strategies (Algebraic, Arithmetic, Graphical method only), Limitations of game theory.	3
VI	**Replacement Theory:** Replacement Problems: Replacement of items that deteriorate with time; Replacement of items that fail completely; staffing problem.	2

VII	**Queuing Theory:** Characteristics of Single Server Queueing model, Application of Poisson and Exponential distribution in estimating arrival rate and service rate; Applications of Queue model for better service to the customers. (No derivation, only application aspects)	3
VIII	**Simulation:** Simulation, process of simulation, types of simulation, steps in simulation process, Monte Carlo simulation, application in queuing, inventory, finance, marketing and HR areas, Advantages & Disadvantages.	3

SECTION B

At least one Case Study from each unit. Questions will be case/inferences/application based

PRACTICAL COMPONENTs:

- Solving and analyzing theoretical problems
- Application of problems by using excel
- Application of Techniques for real life problems
- Conducting data analysis using TORA and MS-Project
- Solving a real business problem using quantitative technique

BOOKS RECOMMENDED:

1. Frederick S. Hillier, Gerald J. Lieberman, Introduction to Operations Research - 9/e, Tata McGraw-Hill, 2011.
2. Sharma S. D, Operations Research: Theory, Methods and Applications, Kedar Nath, Ram Nath& Co.
3. Vohra N. D, Operations Research - 4/e, TMH, 2010
4. Taha H. A, Operations Research: An Introduction - 9/e, PHI
5. Gupta, P. K., and Hira, D. S., Operations Research, S. Chand & Company
6. Ravindran, A., et al., Operations Research, John Wiley & Sons.
7. Kapoor, V. K., Operation Research: Quantitative Techniques for Management, Sultan Chand, 2011

LIST OF JOURNALS/PERIODICALS/MAGAZINES/ARTICLES:

1. International Journal of Operations Research
2. Operations Research Perspectives-Journal-Elsevier
3. Journal of the Operational Research Society
4. Journal of Operations Management
5. International Journal of Production Research

M-204: FINANCIAL MANAGEMENT

OBJECTIVES

1. To understand the financial aspects of managerial decisions.
2. To develop skills to determine capital structure and other financial policies.
3. To develop managerial skills in areas related to investment, financing, and dividend policy decisions.

LEARNING OUTCOMES:

1. Apply financial management concepts and tools to the financing decisions and dividend decisions.
2. Appraise risk profile of firms; specifically, estimate the costs of capital, including debt and equity capital using financial data.
3. Apply concepts and tools to the decisions faced by a manager in investment decisions.
4. Select and apply techniques in assessing and managing working capital

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Financial Management:** Introduction to financial management, objectives of financial management. Changing role of finance managers in contemporary business environment. Interface of Financial Management with other functional areas.	2
II	**Sources of Financing:** Shares, Equity Shares, Preference Shares Debentures, Term loans.	2
III	**Time value of Money:** Future value of single cash flow & annuity, present value of single cash flow, annuity & perpetuity. Capital recovery & loan amortization.	2
IV	**Investment Decisions:** Investment evaluation techniques-Net present value, Internal rate of return, Modified internal rate of return, Profitability index, Payback period, Discounted payback period, Average Rate of Return Method Estimation of cash flow for new project, replacement projects	4
V	**Cost of Capital:** Cost of capital - basic concepts. Cost of term debenture capital, cost of preference capital, cost of equity share capital. Cost of retained earnings. Determination of Weighted average cost of capital (WACC)	4
VI	**Financial Decisions:** Working Capital Management: Working capital determinants, **Current Assets financing policy.** Determination of operating cycle. Estimation of working capital requirements of a firm: Operating Cycle Method and Net Assets Method. Leverage: Operating Leverage, Financial Leverage and Total Leverage.	4
VII	**Capital Structure: Theory and Policy-** Net Income Approach, Modigillani – Miller Approach, Modern Theories, Optimal Capital Structure, EBIT- EBT Analysis, Financial Break- Even.	3
VIII	**Dividend Policy Decisions:** Dividend Policy-Factors affecting the dividend policy - Dividend policies-stable dividend, stable payout. Dividend Theories: Walter, Gordon and MM Approach.	3

SECTION B

At least one Case/Problems from each unit/ Questions will be case/inferences/application based.

Note: 50% of the questions will be numerical.

PRACTICAL COMPONENT:

- Study the sources of finance of any five BSE listed companies & calculate the proportions of their sources of finance.
- Calculate future value of annuity of any five fixed deposits schemes offered by Banks/NBFCs.
- Calculate working capital requirement of any two firms using operating cycle method and net assets method.

- Evaluate investment decisions of any two firms using NPV and payback period method.
- Study dividend policy of any three growth firms for past five years and comment.

BOOKS RECOMMENDED:

1. Pearson Hunt, Charles Marvin Williams, Gordon Donaldson Basic Business Finance: A Text. R. D. Irwin.
2. Hampton, John. J. Financial Decision Making: Concepts, Problems, and Cases. Prentice-Hall International.
3. Prasanna, Chandra.Financial Management. Tata McGraw-Hill.
4. Pandey, I.M. Financial Management.Vikas Publishing House.
5. James, C. Van, Horne. Wachowicz,John. M. Fundamentals of Financial Management. Prentice Hall of India.
6. Khan, M. Y., & Jain, P. K. (2017). Financial Management: Text and Cases. 7th edition.
7. S. B., Hirt, G. A., & Short, J. D. (2000). Foundations of Financial Management. Toronto: McGraw-Hill Ryerson.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/ARTICLES:

1. Journal of Finance.
2. The Review of Financial Studies.
3. Journal of Financial Economics
4. Journal of Financial and Quantitative Analysis
5. Journal of Banking and Finance

M-205: HUMAN RESOURCE MANAGEMENT

OBJECTIVES

1. To acquire basic knowledge of Human Resource Management and develop insight into the managerial skills required to effectively manage people in an organization.
2. To comprehend various facts of managing people and to create an understanding of the various policies and practices of human resource management.
3. To understand significance of career and succession planning.

LEARNING OUTCOMES:

1. Develop understanding of the basic concepts, functions and processes of human resource management.
2. Ability to apply knowledge of human resource planning and implement techniques of job design.
3. Design HRM processes such as Recruitment/Selection/Training/Performance appraisals/Reward Systems etc.
4. Develop competency to recruit, train, and appraise the performance of employees and handle employee issues.

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Introduction:** Human Resource Management- Meaning and significance, Major functions of HRM, HR as a factor of Competitive advantage, Line and Staff responsibility of HR Managers, HR Competencies.	2
II	**Human Resource Planning and Job Analysis:** HR Planning: Meaning, Significance and Process of Human Resource Planning. Job Analysis: Meaning, Importance, Process of Job Analysis. Job Design- Job Enlargement, Job Enrichment, Job Rotation.	3
III	**Recruitment and Selection:** Recruitment: Meaning, Significance and Sources of Recruitment, Cost-Benefit Analysis; Selection: Meaning, Significance and Process, Techniques-Tests and Interviews.	3
IV	**Training and Development:** Meaning and Significance of Training and Development, Process, Training Needs Analysis, Methods of Training- On the Job Methods and Off the Job Methods.	3
V	**Compensation Management:** Job Evaluation: Concept & Methods of Job Evaluation, Types of Compensation: Direct and Indirect, Salary/Wage Fixation, Allowances, Incentives, Bonus, ESOPs, and Fringe Benefits, Emerging Statutory aspects of Compensation & Benefits.	3
VI	**Performance Appraisal:** Meaning and Significance of Performance Appraisal, Methods of Performance Appraisal, Limitations and Problems. Potential Appraisal.	3
VII	**Industrial Relations:** Dynamics of Industrial Relations, Discipline and Domestic Enquiry, Grievance Management, Collective Bargaining, Legal aspects of Employee Relations with reference to Trade Union Act, Industrial Disputes and Settlement Machinery.	4
VIII	**Career and Succession Planning:** Career Planning: Meaning, Significance and Process of Career Planning, Stages of Career Development, Career Anchors. Succession Planning: Meaning, Significance and Process of Succession Planning.	3

SECTION B

At least one Case study/Problem from each module. Questions will be case/inferences/application based

PRACTICAL COMPONENT:

- Expose students to simulated recruitment exercises- Job profile, personal profile, advertisements, etc. and also standard selection tests followed in various sectors.
- Give a job analysis case and ask the students to prepare job description and job specification.
- Give a case and ask the students to prepare the recruitment advertisement for a news paper.
- Ask the students to prepare an appointment letter for the post of office manager of a company known to you.
- Give a performance goal setting case and ask the students to perform dyadic role playing.

Books Recommended:

1. Byars, L & Rue, L. Human Resource Management. McGraw Hill.
2. Aswathappa, K. Human Resource Management. Tata McGraw-Hill.
3. Dessler, Varkkey. Human Resource Management. Pearson.
4. Jyothi. Human Resource Management. Oxford University Press.
5. Mondy, R. Human Resource Management. Prentice Hall.
6. Steve Fleetwood, Anthony Hesketh, Explaining the Performance of Human Resource Management, Cambridge University Press.

7. Michael Armstrong, Human Resources Management Practice, Kogan Page, 10th edition.

LIST OF JOURNALS / PERIODICALS / MAGAZINES / NEWSPAPERS

1. Human Capital
2. Indian Journal of Industrial Relations
3. HRM Review
4. Human Resource Management Journal
5. Indian Journal of Training and Development

M-206: MARKETING RESEARCH

OBJECTIVES

1. To understand the concept and process of Market Research in business environment.
2. To develop the analytical abilities and market research skills.
3. To effectively report research findings.

LEARNING OUTCOMES:

1. Explain research process, and its implementation in functional areas of Business.
2. Apply research design in Qualitative and Quantitative context.
3. Elaborate Exploratory Research Design, Descriptive Research Designs and Experimental Design.
4. Collect field data, formulate appropriate Hypothesis cad carry out Hypothesis Testing.
5. Elaborate Concept of Measurement and Levels of measurement.

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Introduction:** Meaning, Objectives and significance of marketing research, types of marketing research problems, Emerging issues in research. **Marketing Research Process:** Steps Involved in Research Process. Research Design: Various Methods of Research Design	3
II	**Collection of Data:** Concept of Sample, Sample Size and Sampling Procedure, Various Types of Sampling Techniques, Determination and Selection of Sample Member, Types of Data: Primary and Secondary, Various Methods of Collection and Data, Preparation of Questionnaire and Schedule, Types of Questions, Sequencing of Questions, Check Questions, Length of Questionnaire, Precautions in Preparation of Questionnaire and Collection of Data.	4
III	**Data Analysis and Scaling Techniques** Coding, Editing and Tabulation of Data, Various Kinds of Charts and Diagrams Used in Data Analysis: Bar and Pie Diagrams and their Significance, Use of software like SPSS etc., in Data Analysis, Non-parametric & Parametric tests. Measurement Scales, Sources of Error in Measurement scales, Meaning and Classification of Scaling, Attitude Scaling Techniques.	4
IV	**Estimation Theory and Hypothesis Testing:** Sampling theory; Formulation of Hypotheses; Application of Z-test, t-test, F-test and Chi-Square test.	5
V	**Techniques of association of Attributes & Testing :** Application and Analysis of Variance (ANOVA). Nonparametric tests: Mann-Whitney test, Kruskal-Wallis test, Kolmogorov Smirnov Test.	3
VI	Applications of Marketing Research – Customer attitude and satisfaction research, brand equity, advertising effectiveness, copy testing, readership and viewership survey etc.	3
VII	**Research Report Preparation:** Types and Layout of Research Report, Significance of Report writing, Process of report writing, Mechanics of writing a research report, Precautions in Preparing the Research Report. Plagiarism, Paraphrasing & Citation.	1
VIII	**Bibliography and Referencing:** Significance of Bibliography & Referencing, APA style of referencing	1

SECTION B

At least one Case and Problems from each module. Questions will be case/inferences/application based

PRACTICAL COMPONENT:

- Identifying the Problem
- Preparing the Research Proposal
- Designing the Data Collection Instrument
- Conducting Pilot Survey, Final survey, Analyzing the Data using Software's like SPSS, Minitab, IBM Analytics, etc
- Preparing the Research Report.

BOOKS RECOMMENDED:

1. Cooper, Donald. Schindler, R. and Pamela, S. Business Research Methods. McGraw-Hill.
2. Bryman.Business Research Methods.Oxford University Press.
3. Naval Bajpai, Marketing Research:An Indian perspective, Pearson India, 2017
4. Aaker, Kumar & Day: Marketing Research, John Wiley & Sons, 1998
5. Malhotra, N.K, Dash S. (2010), "Marketing Research: An Applied Orientation", (6th Ed.), Pearson Education, India.
6. Zikmund, W.G. and Babin, B. J. (2016), "Essence of Marketing Research", (11th Ed.), Cengage Learning.
7. Beri, G.C. (2013), "Marketing Research", (5th Ed.), Tata McGraw Hill.
8. Green, P. E., Tull, D. S. and Albaum, G., "Research for Marketing Decisions", Prentice Hall of India

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Research in Marketing, Elsevier
2. International Journal of Social Research Methodology
3. Organizational Research Methods: Sage Journals
4. Journal of Marketing Research
5. International Marketing Review

M-207: OPERATIONS MANAGEMENT II

OBJECTIVES

1. To understand the ways and means of making processes or operating systems easier and efficient to use.
2. To comprehend students with the concept of supply chain and logistics management and its significance in business operations.
3. To increase understanding of the problems and opportunities faced by the operations manager in operations.

LEARNING OUTCOMES:

1. Apply Work study techniques in operations.
2. Use continuous improvement techniques for process improvement.
3. Explain different operations processes, and identify different types of process product matrix
4. Prepare a service blueprint for given service providing organization
5. Explain the importance, scope & functions of and issues & integrated framework in Supply Chain

SECTION-A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Work Study:** Motion and Time Study, Problem solving process, Work Method Design, Process analysis, Work measurement: Time Study, Rating, Allowances, Stopwatch time study, predetermined time standards, standard data, Work sampling.	3
II	**Quality Management**: The Dimensions of Quality, Evolution, Quality Gurus, Inspection, Quality Control, Quality Assurance, Quality Cost. Quality Awards, Certification: Introduction to ISO 9000, 14000 and 24700. Total Quality Management, QC Tools	3
III	**Process Quality Improvement**: Statistical Process Control (SPC), Variability, Control Charts for Attributes and Variables, Process capability analysis. Acceptance sampling, Six sigma for process Improvement Introduction to Product Quality Improvement: Quality Function Deployment, Robust Design and Taguchi Method	4
IV	Production Control, Shop-Floor Control, Scheduling Operations, Scheduling in High-Volume Systems, Intermediate-Volume Systems and Low-Volume Systems. Loading: Order Release. Loading and Assignment: Gantt Charts, Infinite and finite loading, Sequencing , priority rules, sequencing jobs through two work centers, scheduling services	3
V	JIT and Lean Operations: Toyota approach, Goals and building blocks of lean systems, Value stream mapping. Transitioning to a lean system, Lean services,	3
VI	Introduction to Maintenance Management: Importance of Maintenance, Types of Maintenance, Breakdown, Preventive, Predictive Maintenance and Total Productive Maintenance	1
VII	Supply Chain Management: Introduction to supply chain and SCM, Trends in Supply Chain Management, Global Supply Chains, ERP and Supply Chain Management, Management Responsibilities: Strategic, tactical, and Operational. E-Business, Supplier management, Inventory Management: bull whip effect, vendor managed inventory, Creating an Effective Supply Chain	3
VIII	Project Management : Introduction, Project Life Cycle, Behavioral Aspects, The Nature of Projects, Key Decisions in Project Management, The Project Manager, Certification, Work Breakdown Structure, Planning and Scheduling with Gantt Charts, PERT and CPM, The Network Diagram, Network Conventions, Computation of Critical Path, Time–Cost Trade-Offs: Crashing, Resource smoothing and levelling. Introduction to Project Management Software.	4

SECTION B

At least one Case Study from each module is to be discussed. Questions will be case/inferences/application based

PRACTICAL COMPONENT:

1. Visit any industrial unit and understand the processes performed in the unit.
2. Use the theoretical knowledge to understand the operations.
3. Prepare a report on how the above concepts used in selected industrial unit under the guidance of your subject teacher.
4. Study of Lean Operations of two Indian Companies.
5. Managerial Implications of Work Study

BOOKS RECOMMENDED:

1 Chase, R. B. et al., Operations and Supply Management, Tata McGraw-Hill, 2010.
2 Blanchard, David., Supply Chain Management Best Practices, NY, John Wiley & Sons, 2006.
3 Stevenson, Operations Management with Student DVD (SIE). Tata McGraw-Hill.
4 Russell & Taylor, III. Operations Management. Prentice Hall of India.
5 Nair, .Production and Operations Management. Tata McGraw-Hill.
6 Govil M., and Proth, J., Supply Chain Design and Management, Academic Press, 2001.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. International Journal of Supply Chain and Operations Resilience
2. Journal of Operations Management (JOM)
3. Journal of Production Research & Management (JoPRM)
4. International Journal of Production Management and Engineering
5. American Journal of Operations Management and Information Systems (AJOMIS)

M-208: NEW ENTERPRISE AND INNOVATION MANAGEMENT

OBJECTIVES
1. To develop the expertise required for creating and starting a new venture.
2. To design creative strategies for pursuing, exploiting and further developing new business opportunities.
3. To analyze issues associated with securing and managing financial resources in new and established organizations.

LEARNING OUTCOMES:
1. Understand the key concepts underpinning entrepreneurship and its application.
2. Enhance the abilities to critically analyze situations and constructing viable solutions to entrepreneurial problems.
3. Conceptualize and implement concepts of innovation and the issues for facilitating innovation within the organizations.
4. Realize the importance of personal attributes that enable best use of entrepreneurial opportunities.

SECTION A

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Introduction to Entrepreneurship:** Entrepreneurship and enterprise: Concept, role in economic development. Entrepreneurial competencies: awareness, assessment, and development. Entrepreneurial and Intrapreneurial mind. Entrepreneur– meaning, importance, traits, types. Entrepreneurial environment – Global Entrepreneurship Environment and Business climate in India.	3
II	**Starting the Venture:** Generating business idea – sources of new ideas, methods of generating ideas, creative problem solving, opportunity recognition; environmental scanning, competitor, and industry analysis; feasibility study – market feasibility, technical/operational feasibility, financial feasibility.	3
III	**New Venture creation:** Minimum Viable Product development and testing, Preparation of Business Plan and its importance. Requisites of a good business plan.	3
IV	**Functional plans: Marketing plan:** Marketing research for the new venture, steps in preparing marketing plan, contingency planning; organizational plan: form of ownership, designing organization structure, Financial plan: Preparing Financial plan for new venture—Need and significance of cash budget, working capital, Performa income statement, Performa cash flow, Performa balance sheet, break even analysis.	4
V	**Sources of finance:** Sources of external finance, short term as well as long term, Debt or equity financing, commercial banks, Angel Investors, venture capital; financial institutions supporting entrepreneurs;	3
VI	**Entrepreneurship Development and Government:** Role of Central Government and State Government in promoting Entrepreneurship, Statutory obligation in starting a unit (general like Income Tax, VAT, CST or GST, Service tax, excise and customs, labour laws, etc.) Start up strategies. Dealing with outside agencies like consultant, contractors, etc. Key marketing issue of new venture. Starting a franchising business. Starting an e-commerce venture. Buying a running business. Introduction to various incentives, subsidies and grants, Export Oriented Units, Fiscal and Tax concessions available. Development of women Entrepreneurs. Institutes supporting entrepreneurs - SIDBI, NABARD, KVIC, NBMSME. Start Up India, Make in India	4
VII	Legal issues: intellectual property rights patents, trademarks, copy rights, trade secrets, licensing, franchising. Cause of failure of new ventures and strategies to deal with, Growth strategies for a new enterprise.	2
VIII	**Innovation Management**: Innovation management an introduction, Types of Innovations organizational setups that facilitate innovations, Incubators and Accelerators- Role in facilitating entrepreneurship.	2

SECTION B

At least one Case Study from each UNIT. Questions will be case/inferences/application based

PRACTICAL COMPONENT

- Prepare a feasibility report/business plan and make presentation in the class.
- Prepare an assignment on at least three leading entrepreneurs
- Visit a franchisee and prepare a report and/or make presentation in the class
- Prepare an assignment on Intellectual Property Rights granted to Indian firms in any specific industry.
- Conducting survey for SME owners to understand the challenges that are faced by them in setting up their business.

BOOKS RECOMMENDED:

1. Rajeev Roy, Entrepreneurship, Oxford University Press, Second Edition.
2. Vasanth Desai, Dynamics of Entrepreneurial Development and Management, Himalaya Publishing House, First Edition.
3. Hisrich, Robert D., Michael Peters and Dean Shephered, Entrepreneurship, Tata McGraw Hill, Eleventh Edition.
4. Charantimath, Poornima, Entrepreneurship Development and Small Business Enterprises, Pearson Education.
5. Kumar Arya, "Entrepreneurship: Creating and Leading an Entrepreneurial Organization", Pearson Education, First Edition.
6. Harvard Business Review Entrepreneur's Handbook (HBR Handbooks)
7. B. Janakiram, M. Rizwana, Entrepreneurship Development: Text & Cases, First Edition.

LIST OF JOURNALS/PERIODICALS/MAGAZINES/NEWSPAPERS

1. Journal of Entrepreneurship and Innovation in Emerging Economies (JEIEE)
2. Journal of Small Business Management
3. Journal of Business Venturing
4. The Economic Times Newspaper

5. Business World Magazine

M-209: MINI-PROJECT

1. The objective is that a student should be able to identify the issues and challenge of the industry and is able to prepare report on the application of emerging technologies in the selected industry.
2. In second semester, the students are required to take one industry as per his/her interest, for analysis and preparing a project report. Preference should be given on the application of emerging technologies in the selected industry. It may consist of Financial Services, Data Science, Social Entrepreneurship, or any other suitable area of interest.
3. The students will prepare seminar under guidance of faculty members allotted by the Director/ Principal /Head of Department of the institute. There will be regular internal assessment and regular classroom interactions as per the number of sessions allotted to it.
4. The student will submit written report of seminar work, prepared individually and shall make an oral presentation before a panel consisting of internal and external examiner (Preferably from Industry) appointed by Director/Principal/HOD. The assessment of 40 marks shall be done by the external examiner appointed by the Head of the department in consultation with Director/Principal of the college. University shall not appoint any examiners for M-209.
5. The average number of pages in the report shall be 40 and should be typed by student himself. The format of the report is to be provided to students by the institute.

M-210: BUSINESS ETHICS LAB.

OBJECTIVES:
1. To comprehend Indian Ethos and values
2. To understand ethical problems and issues in various corporate situations.
3. To participate in case discussions of ethical issues that are grounded in strategic business settings.

LEARNING OUTCOMES:
1. Imbibe concept of ethical issues in corporate governance and adhere to ethical codes.
2. Develop knowledge of various CSR for implementing professional life.
3. Use their ethical imaginations in resolving dilemmas and enhancing business decision-making.
4. Appreciate the relevance of personal values in the business/workplace setting.

SN	DETAILS OF LAB WORK
1	Introduction Business Ethics: Discussion on theories of Ethics. • Case: Rajanna's Ethical Dilemma • Case: The Rise and fall of Vijay Mallya • Case; Business Ethics and Governance Issues at HP: The pretexting Controversy
2	Discussion on relevance of Indian ethos in organization, Indian Management thought Vs Western Management thought, Theory of GUNAS (Sattva, Rajas, Tamas), Doctrine of Karma. Discussion on: • Management lessons from Ramayana • Leadership and Management lessons from Chanakya Nitti • Corporate Lessons from Mahabharat • Management Lessons from Bhagavad Gita. • Presentation on implication of Indian Ethos in Business organizations.
3	Ethical Leadership: Case Study/Discussion with focus on Ethical leadership, • Case: The CEO of Starbucks and the Practice of Ethical Leadership • Case: Case on Executive Integrity • Ethical Leadership Story of Naranmurthy, Infosys • Ethical Leadership Story of Ratan Tata and India's Tata Group • Ethical Issues in Snap's IPO: Evaluating Leadership Character • Role play on Ethical Leadership behaviour
4	Corporate Social Responsibility: Legal Perspectives, Economic Perspectives, Ethical Perspectives. • Case: Managing for Stakeholders • Case: Corporate Social Responsibility in an Indian Public Sector Organization: A Case Study of NTPC • Field work on Corporate Social Responsibility
5	Discussion/ Case Study on Corporate Social Responsibility: • Case: CSR-Amul • Case: Havells India Ltd. • Case: Coca-Cola India: Is It an Eco-friendly Company? • CSR activity of BPCL Ltd. • CSR Activities of Mahindra & Mahindra Ltd. • CSR activities of ITC Ltd.
6	Ethical Issues in Business Area: Discussion on Ethical Issues in business arena of Finance, Marketing, IT etc. • Case: Facebook and our Fake News Problem • Case: Targeting a Broken Heart • Case: The Debacle and Revival of Nestlé India's Maggi

	• Case: Chaos at Uber: The New CEO's Challenge • Case: Volkswagen Emission Cheating Scandal: Matthias Muller's Big Challenge. • Case: Instagram and the Ethics of Privacy • Group Discussion on Ethical Issue (Case reading and discussion on Accounting Scandal of Satyam Ltd.and SAHARA India Fiasco)
7	Ethical Dilemma's: Divide the class into small groups of 4-6 students. Give them exercise on ethical dilemma's and ask each group to do brainstorming and arrive at the possible solutions. They may be present in the class to discuss various perspectives.
8	Corporate Governance: Significance of Corporate Governance in business • Case: Corporate Governance at Unilever • Case: Corporate Governance at Infosys • Assignment on studying Indian Corporate Governance framework

Note: The above list is suggestive. Case studies may be added

CASE REFERENCES:	
1. https://www.etcases.com 2. https://www.icmrindia.org/casestudies 3. https://www.icmrindia.org/casestudies 4. https://www.scu.edu/ethics/focus-areas/internet-ethics 5. https://www.scu.edu/ethics/focus-areas/internet-ethics 6. https://www.scu.edu/ethics/focus-areas/internet-ethics 7. https://www.etcases.com 8. https://distpub.com/product/aid14863-case-study-amul-corporate-social-responsibility 9. theinvestorsbook.com	10. https://www.etcases.com 11. https://www.scu.edu/ethics/focus-areas/internet-ethics 12. https://www.scu.edu/ethics/focus-areas/internet-ethics 13. https://www.etcases.com 14. https://icmrindia.org/casestudies 15. https://www.icmrindia.org/casestudies 16. https://www.scu.edu/ethics/focus-areas/business-ethics 17. https://www.icmrindia.org/casestudies 18. https://www.icmrindia.org/casestudies

BOOKS RECOMMENDED:

1. Zabihollah Rezaee &Timothy Fogarty, Business Sustainability, Corporate Governance, and Organizational Ethics Wiley ,2019
2. Richard A. Spinello, Business Ethics: Contemporary Issues and Cases, SAGE Publications, Inc; 2019
3. Joseph Des Jardins, An Introduction to Business Ethics, McGraw-Hill Education; 2019
4. Denis Collins Business Ethics-Best Practices for Designing and Managing Ethical Organizations, SAGE Publications, Inc. 2018
5. Archie B. Carroll , Jill Brown, Ann K. Buchholtz, Business & Society: Ethics, Sustainability & Stakeholder Management Cengage Learning, 2017
6. Christine Mallin, Corporate Governance, Oxford University Press, 5th Edition, 2015
7. Shitangsu K. Chakraborty, Samir R. Chatterjee, Applied Ethics in Management: Towards New Perspectives, Springer Science & Business Media, 2012

M-211: MANAGÉRIAL COMPUTING LAB

OBJECTIVES
1. To understand relevant applications software related to various courses taught in the semester such as QT, FM, HRM, MM, OM etc.
2. To use the application software packages like MS Excel/ SPSS/ MINITAB/ SYSTAT/R/ SAS/ Statgraphics/ TORA etc.
3. Make optimal business decisions by integrating the concepts of economics, mathematics and statistics.

LEARNING OUTCOMES:
1. Use appropriate computational tools to solve managerial problems using Software
2. Apply the Quantitative Techniques to real life business situations.
3. Use appropriate strategies and tools to analyze data.

SN	DETAILS OF LAB WORK
1	To determine the optimal solution using LPP Technique for problems/case study related to the following with the help of Excel Solver: • Product Mix/Diet/Blending Problems • Production applications • Marketing Applications • Financial Applications
2	To determine the optimal solution using Excel Solver for the problems/case study related to • Transportation • Assignment
3	Using the given survey data, construct the 95% confidence interval estimate of population characteristics for each variable and draw conclusions
4	Case study on correlation and regression analysis
5	Case study on application of Chi Square test to business situation
6	Case Study on discriminant analysis in marketing
7	Case Study on logistic regression for classification and prediction
8	Case study on Factor analysis for data reduction/ cluster analysis for market segmentation
9	To use p-value approach to hypothesis testing to test a mean or proportion: One sample test
10	To use hypothesis testing for comparing between difference between means, proportions, and variances of two populations
11	To carry out One-way ANOVA and Two-way ANOVA
12	To carry out Nonparametric test on the given data and infer results

Note: The above list is suggestive. Experiments/case studies may be added relevant to the theory courses taught in the semester

BOOKS RECOMMENDED:

1. Understanding Educational Statistics Using Microsoft Excel and SPSS, Martin Lee Abott , Wiley 2011
2. Statistics for Managers Using Microsoft Excel (5th Edition)David M. Levine David F. Stephan Timothy C. Krehbiel Mark L. Berenson, Prentice Hall
3. Statistics for Management, 7th edition, Levin & Rubin, Pearson Education Publication
4. Applied Statistics and Probability for Engineers , 6th edition, D. C. Montgomery and G. C. Runger, John Wiley & Sons.
5. Statistical Analysis with Excel For Dummies Joseph Schmuller, John Wiley & Sons, Inc. 2013
6. Business Data Analysis Using Excel, David Whigham ,OUP 2007

SOCIAL OUTREACH, DISCIPLINE & EXTRA CURRICULAR ACTIVITIES (SODECA)

(FOR SEMESTER- I & II MBA)

OBJECTIVES:

- To appreciate the importance and values of social life prevailing in Village.
- To understand the value of Social Work.
- To Understand the Significance of Discipline in student's Life through involving student in plantation, waste management, no plastic campaign, electricity, and water saving activities.
- To understand the value of extra co-curricular activities.

The following various activities are categorized as SODECA:

A. Games and Sports / Field Based Activities: Sports Activities or any other field related activity.

B. Cultural/ Literary Activities: Activities under the banner of Student Body, Celebration of recognized National Days/ Birth Anniversary of great personalities, Hostel Day/ Annual Day/ Fresher's Day or any other related activity.

C. Academic/Technical/ Professional Development Activities: Attending workshops, seminars, FDPs for reasonable duration/numbers. Attending/ paper presentation in conferences**.**

D. Social Outreach / Personality Development Based Activities: Contribution towards social up-gradation based activities, Activities by social organization like, Art of Living, Yoga etc., Blood donation, Awareness programs, personality development programs, activities under different clubs (if not covered under above heads) like, photography etc., NGO activities, Plantation/ cleanliness activities etc.

Involve student in plantation, waste management, no plastic campaign, electricity/Water saving activities and ask written suggestion from each student individually.

E. Anandam Program Activities:

The students are expected to perform the following activates:
Do at least one act of individual service each day
Record this act of service in a dedicated Register/Personal Diary (PD)
Participate in a sharing and presentation on the group service in the discussion session held once a month

Awarding Marks:

Effective contribution and active participation may be judged for awarding the marks. Additionally, following levels may be defined in each components A, B, C, D & E:

Component B	**Level wise Marks**			
	Level-1	Level-2	Level-3	Level-4
A. Games and Sports / Field Based Activities	-	-	50	60
B. Cultural/ Literary Activities	30	40	50	60
C. Academic/Technical/ Professional Development Activities	30	40	50	60
D. Social Outreach / Personality Development Based Activities	30	40	50	60
E. Anandam Program Activities	30	40	50	60
Maximum Marks	**100**			

Level-1:
i. Active Participation in activities at College/City Level
ii. Do at least one act of individual service each day in category E

Level-2:
i. Active participation in multiple activities at Level-1
ii. Participation at State level
iii. Getting award/ recognition at District/State Level
iv. Record this act of service in a dedicated Register/Personal Diary in category E

Level-3:
i. Active participation in multiple activities at Level-2
ii. Participation at National level
iii. Getting award/ recognition at National Level
iv. Participate in a sharing and presentation on the group service in the discussion session held once a month in category E

Level-4:
i. Active participation in multiple activities at Level-3
ii. Participation at International level
iii. Getting award/ recognition at International Level
iv. Providing technical solutions for the social problems

AUDIT COURSE: ENGLISH FOR RESEARCH PAPER WRITING

Course objectives: Students will be able to:

1. Understand that how to improve your writing skills and level of readability
2. Learn about what to write in each section
3. Understand the skills needed when writing a Title
4. Ensure the good quality of paper at very first-time submission

UNIT	COURSE DESCRIPTION	SESSIONS
I	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	2
II	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction	2
III	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.	2
IV	key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature,	2
V	skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions	2
VI	useful phrases, how to ensure paper is as good as it could possibly be the first- time submission	2

BOOKS RECOMMENDED:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)
2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press
3. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman'sbook .
4. Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011

AUDIT COURSE:: DISASTER MANAGEMENT

Course Objectives: -Students will be able to:

1. learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
2. critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
3. develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.

UNIT	COURSE DESCRIPTION	SESSIONS
I	**Introduction** Disaster: Definition, Factors And Significance; Difference Between Hazard And Disaster; Natural And Manmade Disasters: Difference, Nature, Types And Magnitude.	2
II	**Repercussions Of Disasters And Hazards**: Economic Damage, Loss Of Human And Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.	2
III	**Disaster Prone Areas In India** Study Of Seismic Zones; Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics	2
IV	**Disaster Preparedness And Management** Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.	2
V	**Risk Assessment**	2

	Disaster Risk: Concept And Elements, Disaster Risk Reduction, Global And National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation In Risk Assessment And Warning, People's Participation In Risk Assessment. Strategies for Survival.	
VI	**Disaster Mitigation** Meaning, Concept And Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs Of Disaster Mitigation In India.	2

BOOKS RECOMMENDED:

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies "'New Royal book Company.
2. Sahni, PardeepEt.Al. (Eds.)," Disaster Mitigation Experiences And Reflections", Prentice Hall Of India, New Delhi.
3. Goel S. L. , Disaster Administration And Management Text And Case Studies" ,Deep &Deep Publication Pvt. Ltd., New Delhi.

AUDIT COURSE: SANSKRIT FOR TECHNICAL KNOWLEDGE

Course Objectives

1. To get a working knowledge in illustrious Sanskrit, the scientific language in the world
2. Learning of Sanskrit to improve brain functioning
3. Learning of Sanskrit to develop the logic in mathematics, science & other subjects enhancing the memory power
4. The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature

UNIT	COURSE DESCRIPTION	SESSIONS
I	Alphabets in Sanskrit, Past/Present/Future Tense, Simple Sentences	4
II	Order, Introduction of roots Technical information about Sanskrit Literature	4
III	Technical concepts of Engineering-Electrical, Mechanical, Architecture, Mathematics	4

BOOKS RECOMMENDED:

1. Abhyaspustakam" – Dr.Vishwas, Samskrita-Bharti Publication, New Delhi
2. "Teach Yourself Sanskrit" Prathama Deeksha-VempatiKutumbshastri, Rashtriya Sanskrit Sansthanam, New Delhi Publication
3. "India's Glorious Scientific Tradition" Suresh Soni, Ocean books (P) Ltd., New Delhi.

Course Outcomes: Students will be able to

1. Understanding basic Sanskrit language
2. Ancient Sanskrit literature about science & technology can be understood
3. Being a logical language will help to develop logic in students

AUDIT COURSE: VALUE EDUCATION

Course Objectives

1. Understand value of education and self- development
2. Imbibe good values in students
3. Let the should know about the importance of character

UNIT	COURSE DESCRIPTION	SESSIONS
I	Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism. Moral and non- moral valuation. Standards and principles. Value judgements	2
II	Importance of cultivation of values. Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. Honesty, Humanity. Power of faith, National y. Patriotism. Love for nature ,Discipline	3
III	Personality and Behavior Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline. Punctuality, Love and Kindness. Avoid fault Thinking. Free from anger, Dignity of labour. Universal brotherhood and religious tolerance. True friendship. Happiness Vs suffering, love for truth. Aware of self-destructive habits. Association and Cooperation. Doing best for saving nature	4
IV	Character and Competence –Holy books vs Blind faith. Self-management and Good health. Science of reincarnation. Equality, Nonviolence ,Humility, Role of Women. All religions and same message. Mind your Mind, Self-control. Honesty, Studying effectively	3

BOOKS RECOMMENDED:

1. Chakroborty, S.K. "Values and Ethics for organizations Theory and practice", Oxford University Press, New Delhi

Course outcomes: *Students will be able to*

1. Knowledge of self-development
2. Learn the importance of Human values
3. Developing the overall personality

AUDIT COURSE: CONSTITUTION OF INDIA

Course Objectives: Students will be able to:

1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
2. To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
3. To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

UNIT	COURSE DESCRIPTION	SESSIONS
I	History of Making of the Indian Constitution: History Drafting Committee, (Composition & Working)	1
II	**Philosophy of the Indian Constitution:** Preamble Salient Features	2
III	**Contours of Constitutional Rights & Duties:** Fundamental Rights, Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion,Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy Fundamental Duties.	3
IV	Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions	2
V	**Local Administration:** District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Pachayati raj: Introduction, PRI: ZilaPachayat. Elected officials and their roles, CEO ZilaPachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy	2
VI	Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.	2

BOOKS RECOMMENDED:

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

Course Outcomes: Students will be able to:

1. Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
2. Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
3. Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
4. Discuss the passage of the Hindu Code Bill of 1956.

AUDIT COURSE: PEDAGOGY STUDIES

Course Objectives:

Students will be able to:

1. Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers.
2. Identify critical evidence gaps to guide the development.

UNIT	COURSE DESCRIPTION	SESSIONS
I	Introduction and Methodology:	

	• Aims and rationale, Policy background, Conceptual framework and terminology • Theories of learning, Curriculum, Teacher education. • Conceptual framework, Research questions. • Overview of methodology and Searching.	3
II	Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher education.	1
III	Evidence on the effectiveness of pedagogical practices, Methodology for the in depth stage: quality assessment of included studies.	2
IV	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? • Theory of change. • Strength and nature of the body of evidence for effective pedagogical practices. • Pedagogic theory and pedagogical approaches. • Teachers' attitudes and beliefs and Pedagogic strategies.	3
V	Professional development: alignment with classroom practices and follow- up support, Peer support, Support from the head teacher and the community. Curriculum and assessment, Barriers to learning: limited resources and large class sizes	3

BOOKS RECOMMENDED:

1. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, Compare, 31 (2): 245-261.
2. Agrawal M (2004) Curricular reform in schools: The importance of evaluation, Journal of Curriculum Studies, 36 (3): 361-379.
3. Akyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1. London: DFID.
4. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33 (3): 272–282.
5. Alexander RJ (2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.

Course Outcomes: Students will be able to understand:

1. What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
2. What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
3. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

AUDIT COURSE: STRESS MANAGEMENT BY YOGA

Course Objectives

1. To achieve overall health of body and mind
2. To overcome stress

UNIT	COURSE DESCRIPTION	SESSIONS
I	Definitions of Eight parts of yog. (Ashtanga)	4
II	Yam and Niyam. Do`s and Don't's in life. Ahinsa, satya, astheya, bramhacharya and aparigraha Shaucha, santosh, tapa, swadhyay, ishwarpranidhan	4
III	Asan and Pranayam Various yog poses and their benefits for mind & body Regularization of breathing techniques and its effects-Types of pranayam	4

BOOKS RECOMMENDED:

1. 'Yogic Asanas for Group Tarining-Part-I" :Janardan Swami Yogabhyasi Mandal, Nagpur
2. "Rajayoga or conquering the Internal Nature" by Swami Vivekananda, AdvaitaAshrama (Publication Department), Kolkata

Course Outcomes:

Students will be able to:

1. Develop healthy mind in a healthy body thus improving social health also
2. Improve efficiency

AUDIT COURSE: PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS

CourseObjectives

1. To learn to achieve the highest goal happily
2. To become a person with stable mind, pleasing personality and determination
3. To awaken wisdom in students

UNIT	COURSE DESCRIPTION	SESSIONS
I	Neetisatakam-Holistic development of personality • Verses- 19,20,21,22 (wisdom); Verses- 29,31,32 (pride & heroism); Verses- 26,28,63,65 (virtue); Verses- 52,53,59 (dont's); Verses- 71,73,75,78 (do's)	4
II	Approach to day to day work and duties. • Shrimad BhagwadGeeta: Chapter 2-Verses 41, 47,48; Chapter 3-Verses 13, 21, 27, 35; Chapter 6-Verses 5,13,17, 23, 35; Chapter 18-Verses 45, 46, 48.	4
III	Statements of basic knowledge. • Shrimad BhagwadGeeta: Chapter2-Verses 56, 62, 68 ; Chapter 12 -Verses 13, 14, 15, 16,17, 18 • Personality of Role model. Shrimad BhagwadGeeta: Chapter2-Verses 17, Chapter 3-Verses 36,37,42, Chapter 4-Verses 18, 38,39; Chapter18 – Verses 37,38,63	4

BOOKS RECOMMENDED:

1. "Srimad Bhagavad Gita" by Swami SwarupanandaAdvaita Ashram (Publication Department), Kolkata
2. Bhartrihari's Three Satakam (Niti-sringar-vairagya) by P.Gopinath, Rashtriya Sanskrit Sansthanam, New Delh

Course Outcomes: *Students will be able to*

1. Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
2. The person who has studied Geeta will lead the nation and mankind to peace and prosperity

4. Study of Neetishatakam will help in developing versatile personality of students

AUDIT COURSE SYLLABUS: INDIAN ETHOS AND BUSINESS ETHICS

History & Relevance, Principles Practiced by Indian Companies, Role of Indian Ethos in Managerial Practices, Management Lessons from Vedas, Mahabharata, Bible, Quran, Kautilya's Arthashastra, Indian Heritage in Business, Management-Production and Consumption.

Ethics v/s Ethos , Indian v/s Western Management, Work Ethos and Values for Indian Managers- Relevance of Value Based Management in Global Change- Impact of Values on Stakeholders, Trans-Cultural Human Values, Secular v/s Spiritual Values , Value System in Work Culture.

Stress Management-Meditation for mental health, Yoga.

Contemporary Approaches to Leadership- Joint Hindu Family Business–Leadership Qualities of Karta, Indian Systems of Learning-Gurukul System of Learning, Advantages- Disadvantages of Karma, importance of Karma to Managers-Nishkama Karma- Laws of Karma, Law of Creation- Law of Humility- Law of Growth- Law of Responsibility- Law of Connection-Corporate Karma Leadership.

Understanding the need for ethics, Ethical values, myths and ambiguity, ethical codes, Ethical Principles in Business; Theories of Ethics, Absolutism verses Relativism, Teleological approach, the Deontological approach, Kohlberg's six stages of moral development (CMD), Managing Ethical Dilemma; Characteristics, ethical decision making, ethical reasoning, the dilemma resolution process; ethical dilemmas in different business areas of finance, marketing, HRM and international business.

Ethical Culture in Organization, Developing codes of Ethics and conduct, Ethical and value-based leadership. Role of scriptures in understanding ethics, Indian wisdom & Indian approaches towards business ethics

8/4/21
(BOS Convener)

MDA-10– Corporate Social Responsibility

Course Objectives:

1. Capacity building in CSR activities
2. Knowledge and skills in monitoring of CSR activities

Learning Outcomes:

- **Develop an understanding of corporate Social responsibility and Sustainability**
- **To sensitize on concepts of Corporate Social Responsibility**

Unit 1

Introduction: The concept of CSR in Indian Context:

Meaning & Definition of CSR; History & evolution of CSR; Concept of CSR; Principles of CSR; Theories of CSR; CSR through triple bottom line and Sustainable Business; relation between CSR and Corporate governance; Chronological evolution of CSR in India; Models of CSR in India; Concept of Charity, Corporate philanthropy, Corporate Citizenship; Concept of sustainability & Stakeholder Management; Environmental aspects of CSR.

Unit 2

Implementation, Governance and Monitoring of CSR activities:

Constitution of CSR committee and its composition, CSR Design, CSR Budget; Implementation of CSR; CSR Process; CSR Activities; CSR through NGOs; Charitable Societies; Charitable Trusts, Section & Companies; Funding for various CSR activities; Monitoring of CSR activities; Bases for Evaluation of CSR Activities; Ethics, Corporate Citizenship and CSR.

Unit 3

CSR and Corporate Sustainability:

Integration of Corporate Sustainability with CSR; CSR and leadership; CSR and Corporate Governance; CSR and risk Management; CSR as Organizational Brand Building; Board's responsibility towards CSR, CSR for Central Public Sector Enterprises; CSR as multi-organizational system.

Books Recommended:

- Karim, A.(2021). Corporate Social Responsibility, SBPD Publishing House.
- Garg, K. (2021). Corporate Social Responsibility, Edition 3, BHARAT LAW HOUSE PVT LTD.
- Lumde, N. (2018).Corporate Social Responsibility in India: A Practitioner's Perspective, Notion Press; 1st edition.
- Ravichandran, K.S.(2016). Corporate Social Responsibility Emerging Opportunities And Challenges In India, Lexis Nexis; First edition.

25/9/2021
(BOS Convenor)