SCHEME AND SYLLABI

FOR

MASTER OF TECHNOLOGY
Computer Engineering

REGULAR
(SEMESTER SYSTEM)
YEAR 2018-2020
Batch 2018

PART TIME
(SEMESTER SYSTEM)
YEAR 2018-2021
Batch 2018

FACULTY OF ENGINEERING AND TECHNOLOGY
PUNJABI UNIVERSITY, PATIALA
# Scheme for Regular M. Tech. Computer Engineering

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Subject Title</th>
<th>Subject Code</th>
<th>Teaching</th>
<th>Sessional Awards</th>
<th>Theory Awards</th>
<th>Exam Hrs.</th>
<th>Total Marks</th>
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### SEMESTER – I

1. **Computer Network Technologies**
   - MCE-101
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

2. **Design Principles of Operating System**
   - MCE-103
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

3. **Research Methodology**
   - MCE-106
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

4. **Elective Course-I**
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

5. **Elective Course-II**
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

6. **Research Lab**
   - MCE-150
   - Teaching: 0 0 4 2.0
   - Sessional Awards: 100
   - Theory Awards: --
   - Exam Hrs.: --
   - Total Marks: 100

7. **Audit Course – 1**
   - Teaching: 2 0 0 2.0
   - Sessional Awards: 50
   - Theory Awards: --
   - Exam Hrs.: --
   - Total Marks: 50

**Total Credits : 22**

**Total Marks : 650**

### SEMESTER – II

1. **Advance Database Systems**
   - MCE-105
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

2. **Software Engineering Concepts and Methodologies**
   - MCE-104
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

3. **Advanced Data Structure And Applications**
   - MCE-102
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

4. **Elective Course-III**
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

5. **Elective Course-IV**
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

6. **Self Study & Seminar**
   - MCE-151
   - Teaching: 0 0 6 3.0
   - Sessional Awards: 100
   - Theory Awards: --
   - Exam Hrs.: --
   - Total Marks: 100

7. **Open Elective**
   - Teaching: 3 0 0 --
   - Sessional Awards: --
   - Theory Awards: --
   - Exam Hrs.: --
   - Total Marks: --

**Total Credits : 23**

**Total Marks : 600**

### SEMESTER – III

1. **Elective Course-V**
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

2. **Elective Course-VI**
   - Teaching: 3 1 0 4.0
   - Sessional Awards: 50
   - Theory Awards: 50
   - Exam Hrs.: 3 hrs.
   - Total Marks: 100

3. **Major Project**
   - MCE-152
   - Teaching: 0 0 6 3.0
   - Sessional Awards: 100
   - Theory Awards: --
   - Exam Hrs.: --
   - Total Marks: 100

**Total Credits : 11**

**Total Marks : 300**

### SEMESTER – IV

1. **DISSERTATION**
   - MCE-153
   - Teaching: -- -- --
   - Sessional Awards: 10
   - Theory Awards: --
   - Exam Hrs.: --
   - Total Marks: 400

**Total Credits : 10**

**Total Marks : 400**

**Total Credits : 68**

*In addition to above mentioned subjects, there will be an optional 'Open Elective' course (non-compulsory). The student may opt any one 'Open Elective' subject from the list of Punjabi University approved open elective courses, offered by various University departments, with the consent of ACD/Head/Course Mentor of ME department. The list of Open Elective Subjects will be notified by the department to the students.

The Open elective course is optional and not mandatory. Students can opt for this course as an additional subject.
### Scheme for Part-Time M. Tech. Computer Engineering

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<tr>
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<th>Total Marks</th>
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Total Credits : 68

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# LIST OF CORE SUBJECTS

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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>MCE 101</td>
<td>COMPUTER NETWORK TECHNOLOGIES</td>
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<tr>
<td>MCE 102</td>
<td>ADVANCED DATA STRUCTURE AND APPLICATIONS</td>
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<tr>
<td>MCE 103</td>
<td>DESIGN PRINCIPLES OF OPERATING SYSTEM</td>
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<tr>
<td>MCE 104</td>
<td>SOFTWARE ENGINEERING CONCEPTS AND METHODOLOGIES</td>
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<td>MCE 105</td>
<td>ADVANCED DATABASE SYSTEMS</td>
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<td>MCE 106</td>
<td>RESEARCH METHODOLOGY</td>
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# LIST OF ELECTIVES

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<td>MCE 202</td>
<td>DIGITAL IMAGE PROCESSING</td>
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<td>MCE 203</td>
<td>OBJECT ORIENTED ANALYSIS AND DESIGN USING UML</td>
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<td>MCE 204</td>
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# SEMINAR AND MINOR PROJECT

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<tr>
<td>MCE 151</td>
<td>SELF STUDY &amp; SEMINAR</td>
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<td>MCE 152</td>
<td>MAJOR PROJECT</td>
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# DISSERTATION

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# AUDIT COURSE - 1

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<td>ENGLISH FOR RESEARCH PAPER WRITING</td>
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<tr>
<td>MME 302</td>
<td>DISASTER MANAGEMENT</td>
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<td>MME 303</td>
<td>VALUE EDUCATION</td>
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<tr>
<td>MME 304</td>
<td>STRESS MANAGEMENT BY YOGA</td>
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*LIST OF OPEN ELECTIVE COURSES*
(STUDENT CAN OPT ANY NUMBER OF COURSES FROM OPEN ELECTIVE LIST IN ANY SEMESTER)

1. MICRO ECONOMIC ANALYSIS (M.A. BUSINESS ECONOMICS)
2. QUANTITATIVE TECHNIQUES (M.A. BUSINESS ECONOMICS)
3. THEOREY AND PRACTICE OF WAR – I (M.A. DEFENCE & STRATEGIC STUDIES)
4. PROFESSIONAL PHOTOGRAPHY (B. TECH TV, FILM PRODUCTION AND MEDIA TECHNOLOGY)
5. EARLY HISTORY OF BUDDHISM (M.A. BUDDHIST STUDIES)
6. ORIGIN & DEVELOPMENT OF SIKHISM (M.A. BUDDHIST STUDIES)
7. PHILOSOPHICAL FOUNDATIONS OF EDUCATION (M.A. EDUCATION)
8. ENGLISH PHONETICS AND PHONOLOGY (M.A. ENGLISH)
9. ART AND CULTURAL HISTORY OF INDIA (M.A. FINE ARTS)
10. GROWTH & DEVELOPMENT OF PRINT MEDIA (M.A JOURNALISM AND MASS COMMUNICATION)
11. GURU NANAK DEV: METAPHYSICS & EPISODEMETOLOGY (M.A. PHILOSOPHY)
12. INDIVIDUAL AND SOCIETY (M. A. SOCIAL WORK)
13. HUMAN GROWTH AND DEVELOPMENT (M. A. SOCIAL WORK)
14. WOMEN’S MOVEMENT IN INDIA (M.A. WOMEN'S STUDIES)
15. POSITIONAL ASTRONOMY (M.SC. ASTRONOMY & SPACE PHYSICS)

**Note regarding OPEN ELECTIVE:**
(i) It is an over and above the basic requirements for M. Tech. CE degree
(ii) In addition to above open elective subjects, student can opt any other subject offered by university departments with the consent of ACD of CE department.
MCE-101 COMPUTER NETWORK TECHNOLOGIES

L T P Cr
3- 1- 0  4.0

Maximum Marks: 50
Minimum Pass Marks: 40%

Prerequisites: Basics of basics of computer networks.
Objectives: Thorough understanding of Network Technologies.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from Each section A and B of the question paper and the entire section C.

SECTION-A

Data Link Layer: Design issue, framing, error control, flow control, HDLC, SDLC, data link layer in the Internet (SLIP, PPP)

SECTION-B

Presentation layer: date representation, data compression, network security and cryptography Application layer: SMTP and World Wide Web

Reference Books:
1. A. S. Tanenbaum, "Computer Networks", Pearson Education
MCE-102 ADVANCED DATA STRUCTURES AND APPLICATIONS

L T P Cr
3- 1- 0 4.0

Maximum Marks: 50
Minimum Pass Marks: 40%

Prerequisites: Basics of Data Structures
Objectives: Thorough understanding of Data Structures

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

Section A
Complexity Analysis & Elementary Data Structures
Arrays, linked lists, trees and sparse matrices.

Heap Structures
Min-max heaps – D-heaps – Leftist heaps – Binomail heaps – Fibonacci heaps – Skew heaps


Section B
Graph Algorithms:
Topological sort, minimum Spanning tree, single-source shortest paths, all-pairs shortest paths, bi-connected components, strongly connected components, cycles, articulation points, bridges.

Applications

Reference Books:
MCE-103 DESIGN PRINCIPLES OF OPERATING SYSTEM

Prerequisites: This course requires the prior knowledge of Computer fundamentals and data representation.

Objectives: The objective of the course is to overview the state of the art of Operating System fundamentals. The contents allow the reader to apply these concepts to a real operating system.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION-A
Introduction, Operating System components, OS system service, OS Structure: simple structure, layered approach, Microkernels, multiprogramming, time sharing, Real Time Systems, multithreading,

Process Management: Process concept, Process Scheduling, Context switch, CPU scheduling
Deadlocks:- Deadlock Characterization: Necessary conditions, Resource allocation Graph, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from deadlock

Inter-process Communication, Concurrent Processing and concurrency control, Memory management: Contiguous memory management, Paging Segmentation, virtual memory, Demand Paging and Page Replacement Algorithms

SECTION – B

Distributed & Multiprocessor system: Introduction to Distributed Operating system: Features of distributed systems, Nodes of distributed system, Network Operating Systems: Remote Login, Remote File transfer, Distributed operating systems: Data Migration, Computation migration, Process migration, Design issues in Distributed operating systems Multiprocessor operating system organization,

Distributed file systems: Design issues in distributed file systems, transparency, Semantics of File Sharing, Fault Tolerance: Availability, Client and Server Node Failures

Case study of UNIX / LINUX: Introduction, kernel & shell, file system, shell programming

Reference Books:
1. Silberschatz and Galvin, "Operating System Concepts", Addison-Wesley publishing
MCE-104 SOFTWARE ENGINEERING CONCEPTS AND METHODOLOGIES

Prerequisites: Basics of System analysis and design.
Objectives: Thorough understanding of software Engineering concepts.
Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.
Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION A
Principles and Motivations: History; definitions; why engineered approach to software development; Software development process models from the points of view of technical development and project management: waterfall, rapid prototyping, incremental development, spiral models, Agile Software Development, Selection of appropriate development process.
Software Development Methods: Formal, semi-formal and informal methods; Requirements elicitation, requirements specification; Data, function, and event-based modeling; Some of the popular methodologies such as Yourdons SAD, SSADM etc.
Software Project Management: Principles of software projects management; Organizational and team structure; Project planning; Project initiation and Project termination; Technical, quality, and management plans; Project control; Cost estimation methods: Function points and COCOMO

SECTION B
Software Quality Management: Quality control, quality assurance and quality standards with emphasis on ISO 9000; Functions of software QA organization does in a project; interactions with developers; Quality plans, quality assurance towards quality improvement; Role of independent verification & validation; Total quality management; SEI maturity model; Software metrics.
CASE tools-classification, features, strengths and weaknesses; ICASE; CASE standards.
Configuration Management: Need for configuration management; Configuration management functions and activities; Configuration management techniques; Examples and case studies.
Brief introduction to various standards related to Software Engineering.

Recommended Books:
MCE-105 ADVANCED DATABASE SYSTEMS

Prerequisites: Database fundamentals

Objectives: ThorOUGH understanding of Databases.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION – A

Introduction: Database System Concepts and Architecture, Data Independence, Data Models, SQL: DDL, DML, DCL, Database Integrity, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.

Advanced Transaction Processing and Concurrency Control:
Transaction Concepts, Concurrency Control: Locking Methods, Time-stamping Methods, Optimistic Methods for Concurrency Control, Concurrency Control in Distributed Systems.

Object Oriented and Object Relational Databases:
Object Oriented Concepts with respect to Database Systems, OODBMS, ORDBMS Design, Mapping of classes to relations, ORDBMS Query Language (representation of objects by create type, encapsulation of operations, inheritance, storing data about objects, retrieving, updating and query object tables).


SECTION – B

Distributed Databases: Fragmentation, Replication and Allocation for distributed databases, Intra-query parallelism, Inter-query parallelism, Intra-operation parallelism, Inter-operation parallelism.

Backup and Recovery Techniques:

Introduction to PL/SQL: procedure, trigger and cursor.

XML and Internet Databases:

Emerging Database Technologies:
Introduction to Mobile Databases, Main Memory Databases, Deductive Database Systems and brief overview of Datalog, Temporal Databases and brief introduction to TSQL, Multimedia Databases brief overview of respective query language and Spatial and Multidimensional Databases,

Breif Introduction to Data Warehouse, Data Mining and OLAP

Reference Books:

1. Ramez Elmasri, Shamkant Navathe

2. C.J. Date

3. Alexis Leon, Mathews Leon
   Database Management Systems, Leon Press.

4. S. K. Singh

5. Raghu Ramakrishman, Johannes Gehrke
   Database Management Systems, Tata McGraw-Hill.

6. Abraham Silberschatz, Henry F. Korth, S. Sudarshan

7. Thomas Conolly, Carolyn Begg
   Database Systems”, Pearson Education
MCE-106 RESEARCH METHODOLOGY

L T P CR 3-1-0 4.0

Maximum Marks: 50
Minimum Pass Marks: 40%

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION-A
Research Problem: formulation, preparation and presentation of research proposal. Research funding.
Research Design: features, types, experimental designs. Types of sample designs.
Data Collection: primary and secondary data, validation. Processing and Analysis of data: processing operations and problems, types of analysis, use of statistical measures in analysis.

SECTION-B

REFERENCES:
Prerequisites: Fundamentals of computer Networks

Objectives: Thorough understanding of the basics of computer networks and protocols.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION-A

Principles of Security, Basic Cryptographic techniques, Classification of attacks, Virus, Worm, Trojan Horse, Spam etc.

Symmetric Key Cryptography: Algorithm types and modes, Cryptographic Algorithms Asymmetric Key Cryptographic Algorithms, Digital Signature.

SECTION -B

Digital Envelope, Message Authentication Code, Message Digest

Public-Key Infrastructure (PKI) Authentication: Classifications, Mutual authentication Algorithms, Kerberos

Security in layers and domains: IPsec, Secure Socket Layer (SSL), E-mail Security, Electronic transactions

REFERENCE BOOKS :

MCE-202  DIGITAL IMAGE PROCESSING

L  T  P  CR
3- 1- 0  4.0

Maximum Marks: 50  Maximum Time: 3 Hrs.
Minimum Pass Marks: 40%  Lectures to be delivered: 45-55

Prerequisites: Fundamentals of computer graphics and Signal Processing

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION-A


SECTION-B

Image Segmentation: Detection of discontinuities, Edge linking and boundary detection, Thresholding, Region Orientation Segmentation.

Representation and Description: Representation schemes like chain coding, Boundary Descriptors: Fourier, Statistical moments.

Recognition and Interpretation: Elements of Image Analysis, Pattern and pattern classes, Decision Theoretic methods: minimum distance classifier.


Reference Books:
5. Ramesh Jain, Brian G. Schunck, “Machine Vision”, TMH.
MCE-203 OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

L T P CR
3- 1- 0  4.0

Maximum Marks: 50
Minimum Pass Marks: 40%

Prerequisites: Fundamentals of object oriented programming

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION A
Introduction to Object: Object Orientation, Development, Modeling, Object Modeling technique.
Object modeling: Objects and classes, Links and Association, Generalization and inheritance, Grouping constructs, Aggregation, Abstract Classes, Generalization as extension and restriction, Multiple inheritance, Meta data, Candidate keys, Constraints.
Dynamic modeling: Events and states, Nesting, Concurrency, Advanced Dynamic Modeling concepts
Functional modeling: Functional Models, Data flow diagrams, Specifying operations, Constraints, Relation of Functional model to Object and Dynamic Models.

Design Methodology, Analysis: Object modeling, Dynamic modeling, Functional modeling, Adding operations, Iterating Analysis.
System design: Subsystems Concurrency, Allocation to processor and tasks, Management of data stores, Handling Global Resources, Handling boundary Conditions, Setting Trade-off priorities.

Comparison of methodologies: Structured Analysis/Structured Design, Jackson Structured Development.

SECTION B
UML: Basics, Emergence of UML, Types of Diagrams.
Use Case: Actors, Use Case Diagram, Relationships between Use Cases.
Classes: Class Diagram, Classes, Attributes, Operations, Methods, Interfaces, Constraints, Generalization, Specialization, Association, Aggregation.


References Books:
3. BOOCH, “Object Oriented Analysis and Design”, Addison Wesley
7. Rebecca Wirfs-Brock, “Design Object Oriented Software”, PHI
MCE-204 CLOUD COMPUTING

L T P C R
3- 1- 0  4.0

Maximum Marks: 50
Minimum Pass Marks: 40%

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

Section-A
Cloud Computing Architecture- Cloud computing stack: Comparison with traditional computing architecture (client/server), Services provided at various levels, How Cloud Computing Works, Role of Networks in Cloud computing, protocols used, Role of Web services; Service Models (XaaS), Infrastructure as a Service (IaaS) Platform as a Service (PaaS), Software as a Service (SaaS), Deployment Models: Public cloud, Private cloud, Hybrid cloud, Community cloud
Service Management in Cloud Computing: Service Level Agreements (SLAs), Billing and Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling:Benefitting Enormously, Managing Data: Looking at Data, Scalability & Cloud Services, Database & Data Stores in Cloud, Large Scale Data Processing.
Cloud Security- Infrastructure Security, Network level security, Host level security, Application level security, Data security and Storage, Data privacy and security Issues, Jurisdictional issues raised by Data location, Identity & Access Management, Access Control, Trust, Reputation, Risk Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations

Section-B
Introduction to Big Data- Distributed file system–Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce.
Introduction to Hadoop and Hadoop Architecture: Data – Apache Hadoop & Hadoop EcoSystem, Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce -, Data Serialization
NoSQL- What is it?, Where It is Used Types of NoSQL databases, Why NoSQL?, Advantages of NoSQL, Use of NoSQL in Industry, SQL vs NoSQL, NewSQL
Data Base for the Modern Web- Introduction to MongoDB key features, Core Server tools, MongoDB through the JavaScript’s Shell, Creating and Querying through Indexes, Document-Oriented, principles of schema design, Constructing queries on Databases, collections and Documents, MongoDB Query Language.

Recommended Books
7. BIG Data and Analytics, Sima Acharya, Subhashini Chhellappan, Willey
Prerequisites: Fundamentals of computer graphics and image processing

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION – A

Introduction: Introduction to Multimedia, Introduction to Hypermedia and Hyper Text, Multimedia Systems and Desirable Features, Applications, Trends in Multimedia

Storage Media: Magnetic and Optical Media, RAID and its levels, Compact Disc and its standards, DVD and its standards.

SECTION – B


Audio Compression: Introduction to MIDI, Audio Compression. Psychoacoustics, Perceptual Audio Coder, Simple Audio Compression Methods; PCM, DPCM, MPEG-1 Audio Compression, ADPCM speech coder, Vocoder: LPC, CELP. Multimedia System architecture, Components, Quality of service.

Reference Books
2. Ralf Steinmetz and Klara Nahrstedt, Multimedia Computing Communications and Applications By Pearson Educations
MCE-206  INTERNET OF THINGS

L T P CR
3- 1- 0 4.0

Maximum Marks: 50  Maximum Time: 3 Hrs.
Minimum Pass Marks: 40%  Lectures to be delivered: 45-55

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION A


M2M and IoT Technology Fundamentals: Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management

IoT Architecture: State of the Art - Introduction, State of the art

IoT Reference Architecture: Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

SECTION B


Industrial Automation: Service-oriented architecture-based device integration, SOCRAD:ES realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things


References:
MCE-207 NATURAL LANGUAGE PROCESSING

L T P CR
3- 1- 0  4.0

Maximum Marks: 50  Maximum Time: 3 Hrs.
Minimum Pass Marks: 40%  Lectures to be delivered: 45-55

Objectives: To describe the techniques and algorithms used in processing (text and speech) natural languages.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION-A

Introduction: Natural Languages, Application of Natural Language Understanding, Different levels of language analysis
Regular Expressions, Finite state automata, Morphological analysis: Inflectional and derivational morphology, Finite state morphological parsing.

Probabilistic Theory: Introduction to probability, conditional probability, Bayes’ rule and its application.


POS Tagging: Introduction, Word Classes, Rule Based POS, Stochastic POS, Markov assumption, Markov chain, HMM Tagging, Issues of Ambiguity, Multiple tags, Multiple words and unknown words.

SECTION B

Parsing: Introduction, Top down parsing, Bottom up parsing, Problems with top down and bottom up parsing, The Earley algorithm.


Word Sense Disambiguation: Selectional Restriction based Disambiguation, Robust WSD - Machine learning approaches and dictionary based approaches.

Machine Translation: Introduction, Different methods of MT.

Speech Processing: Issues in Speech Recognition, The Sound Structure of Language, Signal processing, Speech Recognition, Prosody and Intonation.

Reference Books:
1. D. Jurafsky and J. Martin, “Speech and Language Processing”, Pearson Education
MCE-208  
SOFT COMPUTING  

L T P CR  
3-1-0 4.0  

Maximum Marks: 50  
Minimum Pass Marks: 40%  
Maximum Time: 3 Hrs.  
Lectures to be delivered: 45-55  

Prerequisites: To get basic knowledge of different soft computing techniques. Different problem solving techniques and their implementations and applications are explained. Intelligent systems and learning techniques are introduced.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION – A  


SECTION – B  


References Book:
MCE-209 EMBEDDED SYSTEMS

L T P C R
3-1-0 4.0

Maximum Marks: 50
Minimum Pass Marks: 40%

Objective: Students will learn about programming paradigms used in parallel computation, about the organization of parallel systems, and about the application of programs and systems to solve interesting problems

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION – A
Introduction to embedded systems definition and Classification, Overview of Processors and hardware units in an embedded system, Software embedded into the system.

Embedded Systems – Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits
Examples of embedded systems: characteristics and requirements, Applications, software issues and architecture.

Interrupt synchronization: General features of interrupts, Interrupt vectors and priorities, External interrupt design approach, Interrupt polling.

Definitions of process, tasks and threads, ISRs and tasks by their characteristics, Operating System Services Goals, Kernel, Process Management, Memory Management, File System Organization and Implementation.

SECTION – B
Real time operating systems: RTOS Task scheduling models - Handling of task scheduling and latency and deadlines as performance metrics, Round Robin Scheduling, Time Slicing, Rate Monotonics, Preemptive Scheduling, Introduction to Vx Works.

Inter process communication and synchronization, Shared data problem, Use of Semaphore(s), Inter Process Communications using Signals, Semaphore, Message Queues, Mailboxes, Pipes, Remote Procedure Calls (RPCs).

I/O Devices - Synchronous and Asynchronous Communications from Serial Devices, Communication Devices - UART and HDLC - Parallel Port Devices, USB and advanced I/O Serial high speed buses- ISA, PCI, PCI-X and cPCI.

REFERENCES BOOKS:
2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint
MCE-210 WIRELESS AND MOBILE NETWORKING

Maximum Marks: 50
Minimum Pass Marks: 40%


Objectives: To acquaint the students with the fundamental concepts of wireless communication and digital cellular standards which are helpful in understanding the state-of-the-art technology in mobile communications and wireless networking.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION-A


SECTION - B

CDMA digital cellular standard: Services, Radio aspects, Security aspects, Traffic channels, Key features of IS-95 CDMA system, Evolutionary directions


Reference Books:
1. Jochen Schiller, “Mobile Communications”, Pearson Education
2. Raj Pandya, “Mobile and Personal Communication-System and Services”, PHI
MCE-211 PARALLEL AND DISTRIBUTED SYSTEMS

Objectives: Students will learn about programming paradigms used in parallel computation, about the organization of parallel systems, and about the application of programs and systems to solve interesting problems

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION – A


Applications of parallel processing: Multiprocessors, Multicomputers and Multithreading.

Introduction: Synchronous - vector/array, SIMD, Systolic, VLIWs.

Hardware taxonomy: Flynn's classifications, Handler's classifications.

Basic issues of parallel computing: delay, concurrency, communication topology, load balancing and scaling.

SECTION – B

Parallel Processors: Taxonomy and topology - shared memory multiprocessors, distributed memory networks. Processor organization - Static and dynamic interconnections.

Performance Metrics: Granularity, Scalability, Load Balancing, speedups and Efficiency.

Introduction to PRAM and its models, Parallelism approaches: data parallelism and control parallelism.

Parallel Programming: Shared memory programming, distributed memory programming, object oriented programming, functional and dataflow programming.

Reference Books:
4. Joseph Ja Ja, An Introduction to Parallel algorithms, Addison Wesley
MCE-212  COMPUTER ANIMATIONS

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Maximum Marks: 50  Maximum Time: 3 Hrs.
Minimum Pass Marks: 40%  Lectures to be delivered: 45-55

Objectives: Students will learn about programming paradigms used in parallel computation, about the organization of parallel systems, and about the application of programs and systems to solve interesting problems.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION – A

Introduction to Multimedia Elements: Text, graphics, audio, video and motion graphics.

Introduction Animation: Its definition, Principles of Animation, early examples of Animation, Animation by Computer.

History of Animation: Stop Motion Photo Animation, Zoetrope, Thaumatrope, Cel and Paper Animation, early Disney’s Cel Animation Processes.

Applications of Animation: in TV Graphics, Scientific Visualization, Simulation, Architecture, Medical and Film industry.

SECTION – B

Types of Animation: Animation Techniques, File formats for Animation, Cel Animation, Stop Motion Animation, 2-D Animation, 3-D Animation.

Keyframe Animation: Creating Keyframes, Auto Keyframes, Move & Scale Keyframe on the timeline, Animating with constraints & simple controllers, animation Modifiers & complex controllers, function curves in the track view, motion mixer.

Multimedia presentation and authoring: Overview, multimedia authoring metaphor, multimedia production, presentation and automatic authoring, Design paradigms and user interface, overview of tools like adobe premiere, director, flash and Dreamweaver.

Reference Books:
3. The Encyclopedia of Animation Techniques, Richard Taylor, 1996 (India)
MCE 213  E-COMMERCE

L T P CR 3- 1- 0  4.0

Maximum Marks: 50  Maximum Time: 3 Hrs.
Minimum Pass Marks: 40%  Lectures to be delivered: 45-55

Objectives: This course offers a good understanding of electronic transactions via Internet

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

Section - A

Overview of e-Business: E-business infrastructure, business design for e-Business, challenge traditional definitions of value, value in terms of customer experience, major business trends.

Supply Chain Management: Supply chain networks, overview of supply chain models and modeling systems. Understanding supply chain through process mapping and process flow chart. Introduction to e-SCM, e-SCM fusion.
Customer Relationship Management: Need of CRM, architecture of CRM, challenges in CRM implementation, e-CRM evolution, multi channel CRM, CRM in B2B model.

Section - B

Translating e-business into action: The overall process – translating e-business into action, basic phases of e-Blueprint planning, e-business project planning checklist, key elements of a business case.

Reference Books:
1. S Sadagopan, “ERP A Managerial Perspective”, TMH
2. Alexis Leon, “ERP Demystified”, TMH
5. Sunil Chopra, Peter Meindl, “Supply Chain Management”, PHI.
MCE-214  ADVANCED COMPUTER ARCHITECTURE

L T P C R
3 1 0 4.0

Maximum Marks: 50
Minimum Pass Marks: 40%

Objectives: This Course offers a good understanding of the various functional units of a computer system and prepares a student towards designing a basic computer system. Finally the student will be introduced to the area of advanced computer architectures.

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION-A
Parallel computer models: Multiprocessors and multicomputers, Multivector and SIMD computers, Architectural development tracks Program and network properties :Conditions of parallelism, Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Program flow mechanisms,Control flow versus data flow,Data flow architecture, Demand driven mechanisms, Comparisons of flow mechanisms.

SECTION-B


REFERENCES:
5. Hwang and Briggs, “Computer Architecture and Parallel Processing”; MGH
Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION A
Need for strategic information, Decision support system, Knowledge discovery & decision making, need for data warehouse, definitions of Data warehousing and data mining, common characteristics of Data warehouse, Data Marts, Metadata, Operational versus analytical databases, trends and planning of Data warehousing.

Multidimensional data model, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations. Data warehouse process & architecture, OLTP vs. OLAP, ROLAP vs. MOLAP types of OLAP, servers, 3 – Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager.

SECTION B
Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications. Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualization specification. Data mining techniques: Association rules, Clustering techniques, Decision tree knowledge discovery through neural Networks & Genetic Algorithm, Rough Sets, Support Vector Machines and Fuzzy techniques. Mining Complex data objects, Spatial databases, Multimedia databases, Time series and Sequence data; mining Text Data bases and mining Word Wide Web.

Reference Books
2. Data Mining – Concepts & Techniques; Jiawei Han & Micheline Kamber – 2001, Morgan Kaufmann.
4. Data Mining Introductory and Advanced Topics, Dunham, Pearson Education.
MCE-216 ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS

L T P CR 3-1-0 4.0

Maximum Marks: 50  Maximum Time: 3 Hrs.
Minimum Pass Marks: 40% Lectures to be delivered: 45-55

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION A
Introduction to AI: Definitions, Historical foundations, Basic Elements of AI, Characteristics of intelligent algorithm, AI application Areas
Problem solving: State space search; Production systems, search space control: depth-first, breadth-first search, heuristic search - Hill climbing, best-first search, branch and bound. Problem Reduction, Constraint Satisfaction End, Means-End Analysis
Handling uncertainty: Non-Monotonic Reasoning, Probabilistic reasoning, use of certainty factors, Fuzzy logic.
Knowledge Based Systems: Proportional Logic, FOPL, Clausal Form, Resolution & Unification. Knowledge representation, acquisition, organisation & Manipulation, Semantic nets, Frames, Conceptual Dependency, Scripts & CYC.

SECTION B

Reference Books:
4. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”, PHI.
MCE-217  

Business Intelligence

Maximum Marks: 50  
Minimum Pass Marks: 40%

Instructions for paper-setter: The question paper will consist of three sections A, B and C. Each section A and B will have five questions from the respective sections of the syllabus (05 marks each). Section C will have one question with 10 short answer objective type parts (02 marks each), which will cover the entire syllabus uniformly.

Instructions for candidates: Candidates are required to attempt seven questions selecting three questions each from sections A and B of the question paper and the entire section C.

SECTION A

Introduction to Business Intelligence
Introduction to digital data and its types – structured, semi-structured and unstructured.
Basics of Data Integration (Extraction Transformation Loading)
Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data - types and sources, Introduction to data quality, data profiling concepts and applications, introduction to ETL using Kettle.

SECTION B

Introduction to Multi-Dimensional Data Modeling
Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using Microsoft Excel.
Basics of Enterprise Reporting
A typical enterprise, Malcolm Baldrige - quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards.

RECOMMENDED BOOKS:
1. R.N. Prasad and Seema Acharya, Fundamentals of Business Analytics, Wiley India Ltd.
2. Mike Biere, Business Intelligence for the Enterprise, Prentice Hall Professional.
## Objectives:

Students must gain knowledge about how to use tools like MS EXCEL, MS WORD, LATEX etc. in research paper writing. Students must gain some knowledge about any one of the tools like MATLAB, SPSS, OPNET, NS2 etc. according to chosen research area.
MCE-151 SELF STUDY & SEMINAR

L T P CR
0 0 6 3

Maximum Marks: 100
Minimum Pass Marks: 50%

Objectives: Problem identification for research work, Literature survey to identify research gaps for research work, Finalize title of research work and to develop research paper writing skills.

Each student will be required to identify a research problem and perform survey literature on the same. The title and objectives for the research work will be chosen by the student in consultation with the Supervisor(s). Each student will be required to show his progress weekly to His/her supervisor. Each student has to give at least two midterm seminars to the concerned supervisor or to the committee constituted by the Head/Coordinator. At the end, student must have a sufficient knowledge about the existing techniques in the research area on which he/she want to work and will be required to submit the Seminar Report and present a talk to an audience of Faculty/Students to defend a title in front of the Evaluation Committee. Each student must publish a paper on the research area.

The final evaluation will be done jointly by the internal Examiners Committee appointed having Faculty Advisor as one of its members.
Objectives: Develop some of the existing techniques using some simulation tool and to develop research paper writing skills.

Each student will be required to implement some of the existing techniques related to the research title chosen under MINOR PROJECT. Each student will be required to show his progress weekly to His/her supervisor and has to give at least two midterm seminars to the concerned supervisor or to the committee constituted by the Head/Coordinator. At the end, student must have a sufficient knowledge and must show simulation results of existing techniques in the chosen research area and will be required to submit the Seminar Report and present a talk to an audience of Faculty/Students in open defense in front of the Project Evaluation Committee. Each student must publish a paper on the research area.

The final evaluation will be done jointly by the internal Examiners Committee appointed having Faculty Advisor as one of its members.
Each student will be required to complete a Dissertation and submit a written Report on the topic on any of the areas of modern technology related to Mechanical Engineering including interdisciplinary fields in the Final semester of M.Tech. course. The title and objectives of the Dissertation will be chosen by the student in consultation with the Supervisor (s) and the same will be required to be defended by the student in open defense in front of the Dissertation Monitoring Committee approved by the Head of Department. The title and objectives will be approved by the Dissertation Monitoring Committee having main Supervisor as one of its members. The progress will also be monitored at weekly coordination meetings with the Supervisor (s). The student will be required to present a talk to the gathering in open defense in front of the Dissertation Monitoring Committee having main Supervisor as one of its members. The Dissertation Monitoring Committee will be constituted by Head of Department for the purpose examining the suitability of the work carried out by the student in the Dissertation for its evaluation by the external examiner. The Dissertation will be sent to the External Examiner for its evaluation only after its due approval by the Dissertation Monitoring Committee. The external evaluation will be done jointly by the main Supervisor and external examiner appointed by the Head of Department. The dissertation (non-credit course) will be either approved or rejected. The external examiner will evaluate the dissertation and the viva-voce will be fixed by the Head of Department. After Viva-voce, the examiners (internal and external) will approve/reject the dissertation. In case, the dissertation is rejected, the candidate will rework and resubmit the dissertation. The dissertation will be again be evaluated jointly by the same external examiner and the Main Supervisor.

**PRE-SUBMISSION SEMINAR EVALUATION** 160 MARKS

**EXTERNAL THESIS EVALUATION** 240 MARKS

**TOTAL MARKS** 400 MARKS

**MINIMUM PASS Marks: 50% in Internal & External Examination Each**
MME 301 ENGLISH FOR RESEARCH PAPER WRITING

L - T - P - Cr.
2 - 0 - 0 - 2.0

Maximum Marks: 50 (Internal)
Minimum Pass Marks: 40%

Lectures to be delivered: 24-30

The objective of this course is to acquaint students to the skills of writing a good research paper. At the end of this course, the student should 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.

SECTION A
Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness


Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.

SECTION B
Key skills needed when writing a Title, key skills needed, when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature

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

Useful phrases, how to ensure paper is as good as it could possibly be the first-time submission

REFERENCES:

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MST - I : 15
MST - II : 15
ATTENDANCE : 10
CONTINUOUS ASSESSMENT : 10

MINIMUM PASS Marks: 50% in Internal Examination
The objective of this course is to acquaint students with the strengths and weaknesses of disaster management approaches.

At the end of this course, the student should 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, (4) planning and programming in different countries, particularly their home country or the countries they work in

SECTION A

Introduction: Disaster: Definition, Factors and Significance; Difference Between Hazard And Disaster; Natural And Mannmade Disasters: Difference, Nature, Types And Magnitude.


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.

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

SECTION B

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.


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.

REFERENCES:
2. Sahni, Pardeep Et.Al. (Eds.), Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.

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MINIMUM PASS Marks: 50% in Internal Examination
MME 303 VALUE EDUCATION

Maximum Marks: 50  (Internal)
Minimum Pass Marks: 40%
Lectures to be delivered: 24-30

The objective of this course is to imbibe good values in students. The course aims at inculcating knowledge of self-development, highlight the importance of Human values and developing the overall personality of students. At the end of this course, the student should be able to: (1) understand value of education and self-development, (2) let the students know about the importance of character.

SECTION A


SECTION B


REFERENCES:
1 Chakroborty, S.K., Values and Ethics for organizations Theory and practice, Oxford University Press, New Delhi

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MST - II : 15
ATTENDANCE : 10
CONTINUOUS ASSESSMENT : 10

MINIMUM PASS Marks: 50% in Internal Examination
MME 304  STRESS MANAGEMENT BY YOGA

L - T - P - Cr.
2 - 0 - 0 - 2.0

Maximum Marks: 50  (Internal)
Minimum Pass Marks: 40%              Lectures to be delivered: 24-30

The objective of this course is to achieve overall health of body and mind and to overcome stress in students.
At the end of this course, the student should be able to: (1) develop healthy mind in a healthy body thus improving social health also, (2) Improve efficiency.

SECTION A

Definitions of Eight parts of yog. (Ashtanga)

Yam and Niyam.
Do’s and Don’t’s in life.
i) Ahinsa, satya, astheya, bramhacharya and aparigraha
ii) Shaucha, santosh, tapa, swadhyay, ishwarpranidhan

SECTION B

Asan and Pranayam
i) Various yog poses and their benefits for mind & body
ii) Regularization of breathing techniques and its effects
Types of pranayam

REFERENCES:
1. “Yogic Asanas for Group Tarining-Part-I” : Janardan Swami Yogabhyasi Mandal, Nagpur
2. “Rajayoga or conquering the Internal Nature” by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata

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MST - II : 15
ATTENDANCE : 10
CONTINUOUS ASSESSMENT : 10

MINIMUM PASS Marks: 50% in Internal Examination