

Department of CSE
Minor Degree in Computer Science and Engineering(CSE)
(for Non IT students)

Scheme of Instruction and Examination
(Effective from 2017-2018)

Scheme: 2017

S. No	Course No.	Course Title	Credits	Scheme of Instruction periods/week		Scheme of Examination Maximum Marks
				L	T	Continuous Internal Assessment
1	MCS01	Introduction to Algorithms	3	3	0	100
2	MCS02	Operating Systems	3	3	0	100
3	MCS03	Object Oriented Programming in Java	3	3	0	100
4	MCS04	Database Management Systems	3	3	0	100
5	MCS05	Software Engineering	3	3	0	100
6	MCS06	Project Work	5	-	10	100
		Total	20	15	10	600

INTRODUCTION TO ALGORITHMS (INA)

B Tech : Minor Degree CSE				Scheme: 2017	
CourseCode	Hours/Week			Credits	Maximum Marks
MCS01	L	T	P	C	Continuous Internal Assessment
	3	0	0	3	100
Sessional ExamDuration:2 Hrs				EndExamDuration:3 Hrs	
CourseOutcomes: At the end ofthecoursestudents willbe able to					
CO1: Understand fundamental characteristics, design, analysis and complexities of algorithms.					
CO2: Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it.					
CO3: Understandand develop algorithms for well-known problems using greedy methods.					
CO4: Understand and apply dynamic-programming approach for designing graph and matrix based algorithms.					
CO5: Understand the concept of backtracking for traversal and search algorithms.					
UNIT- I					
Algorithms- Problem Solving, Introduction to Algorithms, Characteristics of algorithms, Algorithm design tools: Pseudocode and flowchart, Analysis of Algorithms, Complexity of algorithms- Space complexity, Time complexity, Asymptotic notation- Big-O, Theta and Omega.					
UNIT- II					
Divide and Conquer: General method, Binary search, Finding Maximum and Minimum, Merge sort, Quick sort, Strassen's Matrix Multiplication.					
UNIT- III					
Greedy method: The General Method, Knapsack Problem, Tree Vertex splitting, Job Sequencing with Deadlines, Minimum-Cost Spanning Trees, Optimal Storage on Tapes, Optimal Merge Patterns, Single Source Shortest Paths.					
UNIT- IV					
Dynamic Programming: The General Method, Multistage Graphs, All Pairs Shortest Paths, Optimal Binary Search Trees, String Editing problem, Reliability Design, The Travelling Salesperson Problem.					
UNIT- V					
Backtracking: The General Method, The 8-Queens Problem, Sum of Subsets, Graph Coloring and Hamiltonian cycles.					

TextBooks :
1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, SartajSahni and S. Rajasekharan, Universities Press.
ReferenceBooks :
1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.
2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press

OPERATING SYSTEMS (OS)

B Tech : Minor Degree CSE				Scheme: 2017	
CourseCode	Hours/Week			Credits	Maximum Marks
MCS02	L	T	P	C	Continuous Internal Assessment
	3	0	0	3	100
Sessional ExamDuration:2 Hrs				EndExamDuration:3 Hrs	
CourseOutcomes: At the end ofthecoursestudents willbe able to					
CO1: Understand the Operating Systems design structure and its services					
CO2: Demonstrate Process Scheduling algorithms and Inter-Process Communication systems					
CO3: Classify memory management techniques and virtual memory mechanisms					
CO4: Summarize the Disk scheduling algorithms and file system implementation.					
CO5: Apply the Deadlock handling mechanisms					
UNIT- I					
Introduction: What Operating Systems Do, Operating System -Structure, Operations, Services, User Operating System Interface, System Calls, Types of System Calls.					
UNIT- II					
Process Management: Process Concept, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Operations on Processes, Interprocess Communication, Examples of IPC Systems, Process Synchronization, Critical Section Problem, Semaphores, Monitors.					
UNIT- III					
Memory Management: Main Memory-Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Virtual Memory-:Background, Demand paging, Page Replacement, Allocation of Frames.					
UNIT- IV					
Storage Management: Mass Storage Structure- Storage Structure, Disk Structure, Disk Scheduling. File System Interface- File Concepts, Access Methods, File system Structure, File system Implementation, Directory Implementation, Allocation Methods, Free-Space Management.					
UNIT- V					
Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.					

TextBooks :
1. Silberschatz, Galvin and Gagne, Operating System Concepts, 9th edition, [2013] WILEY INDIA Edition.
ReferenceBooks :
1. Gagne [2003], [6th Edition], Operating System Concepts, John Wiley & Sons, Inc publishers.
2. Tanenbaum [2000], Modern Operating System, Pearson Education.
WebReferences:
https://nptel.ac.in/courses/106106144/1

OBJECT ORIENTED PROGRAMMING IN JAVA (OOP)

B Tech : Minor Degree CSE				Scheme: 2017	
CourseCode	Hours/Week			Credits	Maximum Marks
MCS03	L	T	P	C	Continuous Internal Assessment
	3	0	0	3	100
SessionalExamDuration:2 Hrs				EndExamDuration:3 Hrs	
CourseOutcomes: At the end of the course students will be able to					
CO1: Understand the basic programming constructs.					
CO2: Explain inheritance and polymorphism using classes, objects.					
CO3: Understand the string handling methods, abstract classes and interfaces in java.					
CO4: Comprehend the fundamentals of exception handling and file handling mechanisms.					
CO5: Realize the java packages and applet programming.					
UNIT- I					
Introduction to Java: Features of Java, JDK Environment					
Object Oriented Programming Concepts: Classes, Abstraction, Encapsulation, Inheritance, Polymorphism					
Java Programming Fundamentals: Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping (for, while)					
UNIT- II					
Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes.					
UNIT- III					
Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods					
Abstract Class, Interface: Modifiers and Access Control, Abstract classes and methods, Interfaces.					
UNIT- IV					
Exception Handling: Exception types, using try catch and multiple catch, Nested try, throw, throws and finally, Creating User Defined Exceptions.					
File Handling: Byte Stream, Character Stream, File IO Basics, File Operations, creating file, reading file, Writing File.					
UNIT- V					
Packages: Packages Concept, Creating user defined packages					
Applet Programming: Introduction, Types Applet, Applet Life cycle, Creating Applet.					

TextBooks :

- Herbert Schildt [2017], [10th Edition], Java -*The Complete Reference* ,TATA McGraw-Hill.

ReferenceBooks :

- Bruce Eckel [2014], [2nd Edition], *Thinking in Java*, Pearson Education.
- E.Balagurusamy, *Programming with Java: A primer, 5th Edition*, Tata McGraw-Hill, 2017.
- H.M Dietel and P.J Dietel [2017], [11th Edition], Java How to Program, Pearson Ed.

WebReferences:

- <https://nptel.ac.in/courses>
- <https://www.tutorialspoint.com/java/>
- <https://www.javatpoint.com>

DATABASE MANAGEMENT SYSTEMS (DBMS)

B Tech : Minor Degree CSE					Scheme: 2017	
Course Code	Hours/Week			Credits	Maximum Marks	
MCS04	L	T	P	C	Continuous Internal Assessment	
	3	0	0	3	100	
Sessional Exam Duration:2 Hrs				End Exam Duration:3 Hrs.		
Course Outcomes: At the end of the course students will be able to						
CO1: Understand the fundamentals of databases and its working environment.						
CO2: Design real world database systems using Entity Relationship Diagrams from the requirements						
CO3: Use SQL for database creation and manipulation and maintenance.						
CO4: Apply SQL queries for Data aggregation, calculations, views, sub-queries, embedded queries.						
CO5: Apply normalization techniques to normalize a database.						
UNIT- I						
Introduction: Introduction to DBMS, Purpose of Database Systems, Database System Applications, View of Data, Data Models, Database Users, Database Architecture.						
UNIT- II						
Entity-Relationship Model: Basic Concepts, Cardinality of Relationship, ER Diagram Notations, Entity-Relationship Diagrams, Modelling using ER Diagrams, Reduction of an E-R Schema to Tables.						
UNIT- III						
Structured Query Language (SQL): Introduction to SQL, Data types, Data Definition language commands, Data Manipulation language Commands and Data control Language Commands, Candidate Key, Primary key, Foreign key, Select Clause, Where Clause, Logical Connectivity's – AND, OR,						
UNIT- IV						
Advanced SQL: Set Operations–Union, Intersect and Minus, Aggregate Functions, Join operations, views, Sub Queries, Nested Queries, correlated Queries.						
UNIT- V						
Relational Database Design: Features of Good Relational Database Designs, Decomposition, Normalization, Functional Dependency, Types of Normal Forms - First Normal Form, Second Normal Form and Third Normal Form.						
Text Books :						
1. Henry F. Korth& Abraham Silberschatz [2005],[5 Edition], Data Base System Concepts, MC Graw Hill.						
Reference Books :						
1. C J Date [2008], An Introduction to Data Base Systems, Pearson Education.						
2. Elmarsi&Navathe[2015] [7 th Edition],Fundamentals of Database Systems, Pearson Education						
Web References:						
1. https://nptel.ac.in/courses/106105175/2						

SOFTWARE ENGINEERING (SE)

B Tech : Minor Degree CSE					Scheme: 2017	
CourseCode	Hours/Week			Credits	Maximum Marks	
MCS05	L	T	P	C	Continuous Internal Assessment	
	3	0	0	3	100	
Sessional Exam Duration:2 Hrs				EndExam Duration: 3 Hrs		
Course Outcomes: At the end of the course students will be able to						
CO1: Understand the phases of Software development life cycle and Process models						
CO2: Understand the various kinds of software requirements						
CO3: Explain Requirement Engineering process and change management						
CO4: Understand the design concepts, design models.						
CO5: Use the various testing techniques of a software system						
UNIT- I						
Introduction to Software Engineering and Process Models: Introduction, Changing nature of software, Software myths.						
Process Models: The Waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agile process models						
UNIT- II						
Software Requirements: Functional and Non-functional requirements, User requirements, System requirements, The Software requirements document.						
UNIT- III						
Requirement Engineering Process: Feasibility studies, Requirements elicitation and Analysis, Requirement validation, Requirement Management.						
UNIT- IV						
Design: Design process and Design quality, Design concepts-Abstraction, Information Hiding, Functional Independence, Refactoring, Modularity, Refinement, Design Classes, Design Model.						
UNIT- V						
Testing: Testing Strategies-A Strategic approach to Software testing, Test strategies for Conventional software, White Box Testing, Black Box Testing, Validation Testing, System Testing.						
TextBooks :						
1. Roger S.Pressman [2005], [7th Edition], Software Engineering, A Practitioner's Approach, Mc Graw Hill, International Edition.						
2. Sommerville [2008], [7th Edition], Software Engineering, Pearson education.						