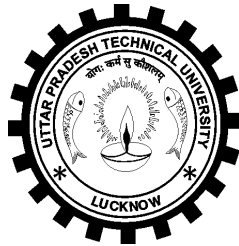


# U.P. TECHNICAL UNIVERSITY LUCKNOW



## Syllabus of Information Technology

**2<sup>nd</sup> Year (III & IV Sem.)**  
[Effective from Session 2009-10]

## **B.Tech.**

**U.P. TECHNICAL UNIVERSITY, LUCKNOW**

**STUDY & EVALUATION SCHEME**

**B. Tech. Information Technology  
[Effective From session 2009-10]  
YEAR II, SEMESTER-III**

S. No.	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credits
			L	T	P	SESSIONAL EXAM.			ESE		
						CT	TA	Total			
<b>THEORY</b>											
1.	ECS-301	Digital Logic Design	3	1	0	30	20	50	100	150	4
2.	EAS-301	Mathematics-III	3	1	0	30	20	50	100	150	4
3.	EHU-301/ EHU-302	Industrial Psychology/ Industrial Sociology	2	0	0	15	10	25	50	75	2
4.	ECS-302	Data Structures Using C	3	1	0	30	20	50	100	150	4
5.	ECS-305	Object Oriented Systems	3	1	0	30	20	50	100	150	4
6.	ECS-304	IT Infrastructure and its Management	3	1	0	30	20	50	100	150	4
7.	<i>EHU-111</i>	<i>*Human Values &amp; Professional Ethics</i>	2	2	0	15	10	25	50	75	
<b>PRACTICAL/DESIGN/DRAWING</b>											
8.	ECS-351	Logic Design Lab	0	0	2	10	10	20	30	50	1
9.	ECS-352	Data structures Lab	0	0	2	10	10	20	30	50	1
10.	ECS-353	OOPS Lab	0	0	2	5	5	10	15	25	1
11.	GP-301	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	17	5	6	-	-	-	-	1000	26

\*Human values & Professional Ethics will be offered as a compulsory audit course for which passing marks are 40% in theory & 50% in aggregate. Students will be required to audit it with in the period of their study. There will not carry over facility for this course and the failure student will be required to repeat this course (in next-semester).

**U.P. TECHNICAL UNIVERSITY, LUCKNOW**

**STUDY & EVALUATION SCHEME**

**B. Tech. Information Technology**

**[Effective from Session 2009-10]**

**YEAR II, SEMESTER-IV**

S. No.	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credits
			L	T	P	SESSIONAL EXAM.			ESE		
						CT	TA	Total			
<b>THEORY</b>											
1.	EHU-402/ EHU-401	Industrial Sociology / Industrial Psychology	2	0	0	15	10	25	50	75	2
2.	EOE-041- EOE-048	Science Based Open Elective	3	1	0	30	20	50	100	150	4
3.	EIT-401	Web Technology	3	1	0	30	20	50	100	150	4
4.	ECS-401	Computer Organization	3	1	0	30	20	50	100	150	4
5.	ECS-402	Database Management Systems	3	1	0	30	20	50	100	150	4
6.	EIT-402	Software Engineering	3	1	0	30	20	50	100	150	4
7.	<i>EHU-111</i>	<i>*Human values &amp; Professional Ethics</i>	2	2	0	15	10	25	50	75	
<b>PRACTICAL/TRAINING/PROJECT</b>											
8.	EIT-451	Software Engineering Lab	0	0	2	10	10	20	30	50	1
9.	ECS-452	DBMS Lab	0	0	2	10	10	20	30	50	1
10.	ECS-453	Computer Organization Lab	0	0	2	5	5	10	15	25	1
11.	GP-401	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	17	5	6	-	-	-	-	1000	26

**Paper Code**

EOE-031/EOE-041

EOE-032/EOE-042

EOE-033/EOE-043

EOE-034/EOE-044

EOE-035/EOE-045

EOE-036/EOE-046

EOE-037/EOE-047

EOE-038/EOE-048

**Science Based Open-Electives**

Introduction to Soft Computing (Neural Networks, Fuzzy Logic and Genetic Algorithm)

Nano Sciences

Laser System and Applications

Space Science

Polymer Science & Technology

Nuclear Science

Materials Science

Discrete Mathematics\*\*

\*\* Note : CS & IT Students can not take the Open Elective Course EOE 048 : Discrete Mathematics.

# ECS-301 : Digital Logic Design

## Unit-I

Digital system and binary numbers: : Signed binary numbers, binary codes, cyclic codes, error detecting and correcting codes, hamming codes.

Floating point representation

Gate-level minimization: The map method up to five variable, don't care conditions, POS simplification, NAND and NOR implementation, Quine Mc-Clusky method (Tabular method).

## Unit-II

Combinational Logic: Combinational circuits, analysis procedure, design procedure, binary adder-subtractor, decimal adder, binary multiplier, magnitude comparator, decoders, encoders, multiplexers

## Unit-III

Synchronous Sequential logic: Sequential circuits, storage elements: latches, flip flops, analysis of clocked sequential circuits, state reduction and assignments, design procedure.

Registers and counters: Shift registers, ripple counter, synchronous counter, other counters.

## Unit-IV

Memory and programmable logic: RAM, ROM, PLA, PAL.

Design at the register transfer level: ASMs, design example, design with multiplexers.

## Unit-V

Asynchronous sequential logic: Analysis procedure, circuit with latches, design procedure, reduction of state and flow table, race free state assignment, hazards.

**Text Book:** M. Morris Mano and M. D. Ciletti, "Digital Design", 4th Edition, Pearson Education

**EAS-301: MATHEMATICS –III**

**L T P**

**3 1 0**

## Unit – I : Function of Complex variable

Analytic function, C-R equations, Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic function, Taylor's and Laurent's series, singularities, Residue theorem, Evaluation of real integrals of the type  $\int_0^{2\pi} f(\cos \theta, \sin \theta) d\theta$  and  $\int_{-\infty}^{\infty} f(x) dx$

10

## Unit – II : Statistical Techniques - I

Moments, Moment generating functions, Skewness, Kurtosis, Curve fitting, Method of least squares, Fitting of straight lines, Polynomials, Exponential curves etc., Correlation, Linear, non –linear and multiple regression analysis, Probability theory.

08

## Unit – III : Statistical Techniques - II

Binomial, Poisson and Normal distributions, Sampling theory (small and large), Tests of significations: Chi-square test, t-test, Analysis of variance (one way) , Application to engineering, medicine, agriculture etc.

Time series and forecasting (moving and semi-averages), Statistical quality control methods, Control charts,  $\bar{x}$ , R, p, np, and c charts.

08

## Unit – IV : Numerical Techniques – I

Zeros of transcendental and polynomial equation using Bisection method, Regula-falsi method and Newton-Raphson method, Rate of convergence of above methods.

Interpolation: Finite differences, difference tables, Newton's forward and backward interpolation , Lagrange's and Newton's divided difference formula for unequal intervals.

08

## Unit – V : Numerical Techniques –II

Solution of system of linear equations, Gauss- Seidal method, Crout method. Numerical differentiation, Numerical integration , Trapezoidal , Simpson's one third and three-eighth rules, Solution of ordinary differential (first order, second order and simultaneous) equations by Euler's, Picard's and forth-order Runge- Kutta mehtods.

08

### Test Books :-

1. Peter V. O'Neil, Advance Engineering Mathematics Thomson (Cengage) Learning, 2007.
2. Jain, Iyenger & Jain, Numerical Methods for Scientific and Engineering Computation, New Age International, New Delhi , 2003.
3. J.N. Kapur, Mathematical Statistics, S. Chand & company Ltd.,2000

### Reference Books :-

1. R.K. Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publication House, 2002.
2. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudralaya, 1996.
3. E. Kreysig, Advanced Engineering Mathematics, John Wiley & Sons, 2005.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2005.
5. Devi Prasad, An introduction to Numerical Analysis, Narosa Publication house, New Delhi 2006.

## ECS-302 : DATA STRUCTURES USING - C

L	T	P
3	1	0

### Unit - I

Introduction: Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT)

Arrays: Definition, Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Application of arrays, Sparse Matrices and their representations.

Linked lists: Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representation and Addition, Generalized Linked List

### Unit – II

Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Tower of Hanoi Problem, Simulating Recursion, Principles of recursion, Tail recursion, Removal of recursion

Queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.

### Unit – III

Trees: Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Algebraic Expressions, Extended Binary Trees, Array and Linked Representation of Binary trees, Tree Traversal algorithms: Inorder, Preorder and Postorder, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm.

### Unit – IV

Graphs: Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal : Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prims and Kruskal algorithm. Transitive Closure and Shortest Path algorithm: Warshal Algorithm and Dijkstra Algorithm, Introduction to Activity Networks

### Unit – V

Searching : Sequential search, Binary Search, Comparison and Analysis  
Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Radix Sort, Practical consideration for Internal Sorting.

Search Trees: Binary Search Trees(BST), Insertion and Deletion in BST, Complexity of Search Algorithm, AVL trees, Introduction to m-way Search Trees, B Trees & B+ Trees

Hashing: Hash Function, Collision Resolution Strategies  
Storage Management: Garbage Collection and Compaction.

**Text books and References:**

1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein “Data Structures Using C and C++” , PHI
2. Horowitz and Sahani, “Fundamentals of Data Structures”, Galgotia Publication
3. Jean Paul Trembley and Paul G. Sorenson, “An Introduction to Data Structures with applications”, McGraw Hill
4. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education
5. Lipschutz, “Data Structures” Schaum’s Outline Series, TMH
6. G A V Pai, “Data Structures and Algorithms”, TMH

**ECS-305 : Object Oriented Systems****L T P  
3 1 0****Unit – I**

**Object Modeling:** Objects and classes, links and association, generalization and inheritance, aggregation, abstract class, multiple inheritance, meta data, candidate keys, constraints.

**Unit – II**

**Dynamic Modeling:** Events and states, operations, nested state diagrams and concurrency, advanced dynamic modeling concepts, a sample dynamic model.

**Unit – III**

**Functional Modeling:** Data flow diagram, specifying operations, constraints, a sample functional model. OMT (object modeling techniques) methodologies, examples and case studies to demonstrate methodologies, comparisons of methodologies, SA/SD, JSD.

**Unit – IV**

**Java Programming:** Introduction, Operator, Data types, Variables, Methods & Classes, Multithread Programming, I/O, Java Applet.

**Java Library:** String Handling, Input/Output exploring Java.io, Networking, Applets classes, Event Handling, Introduction to AWT, Working with window, Graphics, AWT Controls, Layout Manager and Menus, Images, Additional packages.

**Unit – V****Software Development using Java:**

Java Beans, Java Swing, Java Servlets, Migrating from C++ to java, Application of java, Dynamic Billboard Applet, Image Menu: An image based menu, Lavatron Applets, Scrabblets, JDBC, Brief functioning of upper layer E-mail and their applications.

**Text Books:**

1. James Rumbaugh etal, “Object Oriented Modeling and Design”, PHI
2. Herbert Schildt, “The Complete Reference: Java”, TMH.
3. E. Balagurusamy, “Programming in JAVA”, TMH.

**References:**

1. Booch Grady, “Object Oriented Analysis & Design with application 3/e”, Pearson Education, New Delhi.
2. Bjarne Stroustrup, “C++ Programming Language”, Addison Wesley
3. E. Balagurusamy, “Object Oriented Programming with C++”, TMH

## **ECS-304 : INFORMATION TECHNOLOGY INFRASTRUCTURE AND ITS MANAGEMENT**

### **UNIT I:**

INTRODUCTION-Information Technology, Computer Hardware, Computer Software, Network and Internet, Computing Resources,

IT INFRASTRUCTURE- Design Issues, Requirements, IT System Management Process, Service Management Process, Information System Design, IT Infrastructure Library

### **UNIT II:**

SERVICE DELIVERY PROCESS- Service Delivery Process, Service Level Management, Financial Management, Service Management, Capacity Management, Availability Management

### **UNIT III:**

SERVICE SUPPORT PROCESS- Service Support Process, Configuration Management, Incident Management, Problem Management, Change Management, Release Management

STORAGE MANAGEMENT- Backup & Storage, Archive & Retrieve, Disaster Recovery, Space Management, Database & Application Protection, Bare Machine Recovery, Data Retention

### **UNIT IV:**

SECURITY MANAGEMENT- Security, Computer and internet Security, Physical Security, Identity Management, Access Management. Intrusion Detection, Security Information Management

### **UNIT V:**

IT ETHICS- Introduction to Cyber Ethics, Intellectual Property, Privacy and Law, Computer Forensics, Ethics and Internet, Cyber Crimes

EMERGING TRENDS in IT- Electronics Commerce, Electronic Data Interchange, Mobile Communication Development, Smart Card, Expert Systems

## **ECS -351 : Logic Design Lab**

**Objective:** To understand the digital logic and create various systems by using these logics.

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of  $V_{cc}$  and ground, verification of the truth tables of logic gates using TTL ICs.
2. Implementation of the given Boolean function using logic gates in both SOP and POS forms.
3. Verification of state tables of RS, JK, T and D flip-flops using NAND & NOR gates.
4. Implementation and verification of Decoder/De-multiplexer and Encoder using logic gates.
5. Implementation of 4x1 multiplexer using logic gates.
6. Implementation of 4-bit parallel adder using 7483 IC.
7. Design, and verify the 4-bit synchronous counter.
8. Design, and verify the 4-bit asynchronous counter.
9. Mini Project.

## **ECS-352 : Data Structure Lab**

**L T P**  
**0 0 2**

**Write Program in C or C++ for following.**

- Array implementation of Stack, Queue, Circular Queue, List.
- Implementation of Stack, Queue, Circular Queue, List using Dynamic memory Allocation.
- Implementation of Tree Structures, Binary Tree, Tree Traversal, Binary Search Tree, Insertion and Deletion in BST.
- Implementation of Searching and Sorting Algorithms.
- Graph Implementation, BFS, DFS, Min. cost spanning tree, shortest path algorithm.

## **ECS-354 : OOPS Lab**

**L T P**  
**0 0 2**

Experiments based on the course Object Oriented Systems to be done on C++/JAVA/UML/VISIO etc.

## **EIT-401 : Web Technology**

**L T P**  
**3 1 0**

### **UNIT I**

Introduction and Web Development Strategies

History of Web, Protocols governing Web, Creating Websites for individual and Corporate World, Cyber Laws

Web Applications, Writing Web Projects, Identification of Objects, Target Users, Web Team, Planning and Process Development.

### **UNIT II**

HTML, XML and Scripting

List, Tables, Images, Forms, Frames, CSS

Document type definition, XML schemes, Object Models, Presenting XML, Using XML Processors: DOM and SAX

Introduction to Java Script, Object in Java Script, Dynamic HTML with Java Script.

### **UNIT III**

Java Beans and Web Servers

Introduction to Java Beans, Advantage, Properties, BDK, Introduction to EJB, Java Beans API

Introduction to Servlets, Lifecycle, JSDK, Servlet API, Servlet Packages: HTTP package, Working with Http request and response, Security Issues.

#### **UNIT IV**

##### **JSP**

Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit JSP objects, Conditional Processing, Declaring variables and methods, Error Handling and Debugging, Sharing data between JSP pages- Sharing Session and Application Data.

#### **UNIT V**

##### **Database Connectivity**

Database Programming using JDBC, Studying Javax.sql.\*package, accessing a database from a JSP page, Application-specific Database Action, Developing Java Beans in a JSP page, introduction to Struts framework.

#### **REFERENCE:**

1. Burdman, "Collaborative Web Development" Addison Wesley.
2. Chris Bates, "Web Programming Building Internet Applications", 2<sup>nd</sup> Edition, WILEY, Dreamtech
3. Joel Sklar, "Principal of web Design" Vikash and Thomas Learning
4. Horstmann, "CoreJava", Addison Wesley.
5. Herbert Schildt, "The Complete Reference:Java", TMH.
6. Hans Bergsten, "Java Server Pages", SPD O'Reilly

### **ECS-401 : COMPUTER ORGANIZATION**

Fourth Semester B.Tech CSE & IT

**L T P**  
**3 1 0**

#### **Unit-I Introduction:**

Number representation; fixed and floating point number representation, IEEE standard for floating point representation. Error detection and correction codes: Hamming code.

Digital computer generation, computer types and classifications, functional units and their interconnections, buses, bus architecture, types of buses and bus arbitration.

Register, bus and memory transfer.

#### **Unit-II Central Processing Unit:**

Addition and subtraction of signed numbers, look ahead carry adders. Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation

Processor organization, general register organization, stack organization and addressing modes.

#### **Unit-III Control Unit:**

Instruction types, formats, instruction cycles and subcycles ( fetch and execute etc) , micro-operations, execution of a complete instruction.

Hardwire and microprogrammed control: microprogramme sequencing, wide branch addressing, microinstruction with next address field, pre-fetching microinstructions, concept of horizontal and vertical microprogramming.

#### **Unit-IV Memory:**

Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 1/2D memory organization. ROM memories.

Cache memories: concept and design issues (performance, address mapping and replacement)

Auxiliary memories: magnetic disk, magnetic tape and optical disks

Virtual memory: concept implementation.

#### **Unit-V Input / Output:**

Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions.

Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors.

Serial Communication: Synchronous & asynchronous communication, standard communication interfaces.

#### **Books**

1. Patterson, Computer Organisation and Design, Elsevier Pub. 2009
2. William Stallings, "Computer Organization", PHI
3. Vravice, Hamacher & Zaky, "Computer Organization", TMH
4. Mano, "Computer System Architecture", PHI
5. John P Hays, "Computer Organization", McGraw Hill
6. Tannenbaum, "Structured Computer Organization", PHI
7. P Pal chaudhry, 'Computer Organization & Design', PHI

### **ECS-402 : DATA BASE MANAGEMENT SYSTEM IVth Semester B. Tech. CSE & IT**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>1</b>	<b>0</b>

#### **Unit-I**

**Introduction:** An overview of database management system, database system Vs file system, Database system concept and architecture, data model schema and instances, data independence and database language and interfaces, data definitions language, DML, Overall Database Structure.

#### **Data Modeling using the Entity Relationship Model:**

ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationship of higher degree.

#### **Unit-II**

**Relational data Model and Language:** Relational data model concepts, integrity constraints, entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus.

**Introduction on SQL:** Characteristics of SQL, advantage of SQL. SQL data type and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors, Triggers, Procedures in SQL/PL SQL

### Unit-III

**Data Base Design & Normalization:** Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependence, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

### Unit-IV

**Transaction Processing Concept:** Transaction system, Testing of serializability, serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

**Distributed Database:** distributed data storage, concurrency control, directory system.

### Unit-V

**Concurrency Control Techniques:** Concurrency control, Locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transaction, case study of Oracle.

### Books

1. Date C J, " An Introduction to Database Systems", Addison Wesley
2. Korth, Silbertz, Sudarshan," Database Concepts", McGraw Hill
3. Elmasri, Navathe, " Fudamentals of Database Systems", Addison Wesley
4. O'Neil, Databases, Elsevier Pub.
5. Leon & Leon,"Database Management Systems", Vikas Publishing House
6. Bipin C. Desai, " An Introduction to Database Systems", Gagotia Publications
7. Majumdar & Bhattacharya, "Database Management System", TMH
8. Ramkrishnan, Gehrke, " Database Management System", McGraw Hill
9. Kroenke, " Database Processing Fundamentals , Design and Implementation" Pearson Education.
10. D.Ulman, " Principles of Database and Knowledge base System", Computer Science Press.
11. Maheshwari Jain.'DBMS: Complete Practical Approach", Firewall Media, New Delhi

## EIT-402 : Software Engineering

L	T	P
3	1	0

### Unit-I: Introduction

Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes.

Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

### Unit-II: Software Requirement Specifications (SRS)

Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS.

Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model.

### **Unit-III: Software Design**

Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design.

Software Measurement and Metrics: Various Size Oriented Measures: Halestead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.

### **Unit-IV: Software Testing**

Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products. Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.

### **Unit-V: Software Maintenance and Software Project Management**

Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools.

Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO), Resource Allocation Models, Software Risk Analysis and Management.

### **Reference Books:**

1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
3. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
4. Carlo Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication.
5. Ian Sommerville, Software Engineering, Addison Wesley.
6. Pankaj Jalote, Software Engineering, Narosa Publication
7. Pfleeger, Software Engineering, Macmillan Publication.
8. A. Leon and M. Leon, Fundamentals of Software Engineering, Vikas Publication.

### **EIT-451 : Software Engineering LAB**

**L T P**  
**0 0 2**

1. Program for configuration Management.
2. Perform SA/SD for the following software.
  - Hotel Automation System
  - Book Shop Automation Software

- Word processing Software
  - Software Component Cataloguing Software.
3. Design and development of test cases for testing.
  4. Writing program in Java for Computing Cyclomatic Complexity.
  5. Development of Software tool for Halstead Analysis.
  6. Perform Cost/Benefit analysis.
  7. Illustration of various activities of Software development using MS Project 2000.
  8. Lab exercise involving development of various practical applications using software like VJ++VB, SYBASE, JDK.  
[Students are to be given a major assignment to be completed using one or more of these tools, Student's exposure to any CASE tool is desirable]
  9. Case Studies : Payroll System, Banking System, Purchase Order System, Library Management System, Railway Reservation System, Bill Tracking System, College Admission System, State Management System.

### **ECS-452 : DBMS LAB**

L T P  
0 0 2

1. Write the queries for Data Definition and Data Manipulation Language.
2. Write SQL queries using logical operations (=,<,>,etc)
3. Write SQL queries using SQL operators
4. Write SQL query using character, number, date and group functions
5. Write SQL queries for relational algebra
6. Write SQL queries for extracting data from more than one table
7. Write SQL queries for sub queries, nested queries
8. Write programme by the use of PL/SQL
9. Concepts for ROLL BACK, COMMIT & CHECK POINTS
10. Creat VIEWS, CURSORS and TRGGERS & write ASSERTIONS.
11. Creat FORMS and REPORTS

#### **Note:**

1. The queries to be implemented on DBMS using SQL
2. Students are advised to use Developer 2000/Oracle9i or other latest version for above experiments.. However student may use Power Builder/SQL SERVER . Mini Projects may also be planned & carried out through out the semester to understand important concepts of database.

## **ECS-453 : COMPUTER ORGANIZATION LAB**

<b>L</b>	<b>T</b>	<b>P</b>
<b>0</b>	<b>0</b>	<b>2</b>

1. Bread Board Implementation of Flip-Flops.
2. Experiments with clocked Flip-Flop.
3. Design of Counters.
4. Bread Board implementation of counters & shift registers.
5. Implementation of Arithmetic algorithms.
6. Bread Board implementation of Adder/Subtractor (Half, Full)
7. Bread Board implementation of Binary Adder.
8. Bread Board implementation of Seven Segment Display.

Institute may also develop the experiment based on the infrastructure available with them.