VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
Ibrahimbagh, Hyderabad-31

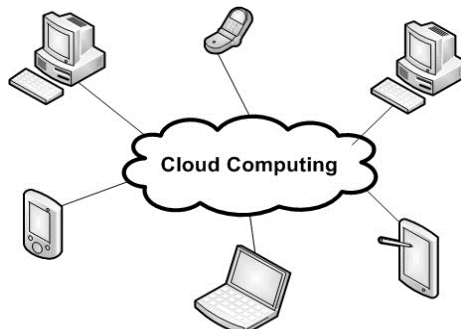Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad

STUDENT HAND BOOK 2016 – 2017

Academic Regulations (Autonomous) and Syllabi of
THIRD YEAR B.E(IT)

DEPARTMENT OFINFORMATION TECHNOLOGY
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VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OFINFORMATION TECHNOLOGY

<u>DEPARTMENT VISION</u>

To be a centre of excellence in core Information Technology and multidisciplinary learning and research, where students get trained in latest technologies for professional and societal growth.

<u>DEPARTMENT MISSION</u>

To enable the students acquire skills related to latest technologies in IT through practice- oriented teaching and training.

ABOUT THE COLLEGE

Established in 1981 by Vasavi Academy of Education under the stewardship of Late Sri Pendekanti Venkata Subbaiah, a veteran statesman of independent India and by a few eminent people from different walks of life Vasavi College of Engineering represents a rich tradition of excellence in technology based education in a stimulating environment. From a modest beginning with just three undergraduate programs, viz., B.E. degree programs in Civil, Mechanical and Electronics & Communication Engineering, with dedicated efforts for over **33** years, it has now grown into a mighty center of learning with excellent and well-developed infrastructural facilities, offering 6 undergraduate programs, viz., B.E. in Civil, Mechanical, Electrical & Electronics, Electronics & Communication Engineering, Computer Science & Engineering, and Information Technology, in addition to a3-year postgraduate program in Computer Applications (MCA), and 2-Year Postgraduate Programmes in CSE, ECE, EEE and Mechanical Engineering.

All the undergraduate (B.E) programs were accredited by National Board of Accreditation (NBA) for the academic years 2013-2015. The college sought fresh approval for NBA accreditation for two eligible PG programs and MCA program. The college has been recognized under 12(B) and 2(f) sections of the University Grants Commission (UGC).

The college has been granted *autonomy by the University Grants Commission*, New Delhi and Osmania University, Hyderabad for all the programs it offers for a period of six years with effect from 2014-15.

The College has 185 highly qualified and experienced faculty members consisting of Professors, Associate Professors and Assistant Professors and around **158** technical and supporting staff. The college has very good infrastructural facilities which go beyond the curriculum requirements. The college offers value-added courses in GIS, CAD/CAM, DSP, VLSI, Networking, J2EE and communication skills to bridge the gap between the curriculum and the requirements of the Industry. Finishing school has been made part of curriculum from the second year onwards to improve the skills of the students.

A Research & Development (R&D) Cell is established by personnel from industry / research organization to encourage the faculty and the students in acquiring additional qualifications and knowledge.

This Cell also facilitates the faculty for interaction with industry/research organizations in getting sponsored research projects. In addition, the college extends consultancy in various fields of engineering and technology. The Center for Counseling and Placement at Vasavi College of Engineering provides personal and career-related support to its students. The educational experience at the college is enlivened and enriched by an array of extra-curricular activities to fulfill the cultural and emotional needs of students.

> ## QUALITY POLICY
>
> *Education without quality is like a flower without fragrance. It is our earnest resolve to strive towards high standards of teaching, training and developing human resources.*

A good number of ranks in university examinations are secured by our students every year. The all-round development of a student is achieved by exposing him/her to the outside world in a systematic and well planned manner. Just not marks and ranks, but also ethics and morals are incorporated into psyche of a student at Vasavi in a cautious way. This unification of tradition and technology makes Vasavi a place for paradise of learning.

ACADEMIC RULES AND REGULATIONS
FOR FOUR YEAR B.E DEGREE COURSE
w.e.f 2016-17 Academic Year

1. RULES OF PROMOTION

ATTENDANCE: The *minimum aggregate attendance* percentage for BE program *is 75%*. On medical grounds 65% attendance with valid medical certificate will be considered. A candidate who did not meet above attendance requirements is not eligible to appear for the semester examinations.

A student is allowed to use medical condonation facility only 4 (four) times in the entire period of 8 semesters in the span of 4 years B.E program.

2. ASSESSMENT AND EVALUATION SYSTEM:

There will be continuous and comprehensive evaluation of students. The distribution of sessional (internal) and semester examination marks for *B.E programme* are given below:

SESSIONALS EXAMS (internals)
Theory: **30 Marks**

- **20** Marks each for two internal examinations in a semester and 10 marks for assignments and quizzes etc together.
- **Average of two tests** will be considered for calculating internal exams marks to which assignment/quiz marks will be added for obtaining total CIE marks.
- Every student should secure a **minimum of 40% aggregate marks in the internal exams.**

Lab: 25 Marks

15 marks for day-to-day laboratory class work which will be awarded based on the average of all experiments.
- 10 marks for the internal examination.

3. PROMOTION RULES TO NEXT HIGHER CLASS

S No	Semester/Class	Conditions to be fulfilled for
1	From 1/4 BE, I-SEM to 1/4 BE, II-SEM	Regular course of study of 1/4 B.E, I-SEM and 40% aggregate sessional marks in I-SEM
2	From 1/4 BE, II-SEM to 2/4 BE, I SEM	(a) Regular course of study of 1/4 B.E-II SEM and (b) Must have secured at least 50% of total credits prescribed for 1/4 B.E.
3	From 2/4 BE, I-SEM to 2/4 BE, II-SEM	Regular course of study of 2/4 BE, I-SEM and 40% aggregate sessional marks in II- SEM
4	From 2/4 BE, II-SEM to 3/4 BE, I SEM	(a) Regular course of study of 2/4 BE II SEM (b) Must have secured at least 50% of total credits prescribed for 2/4B. E and passed in all the subjects 1/4 B.E.
5	From 3/4 BE, I-SEM to 3/4 BE, II-SEM	Regular course of study of 3/4 B.E, I-SEM, and 40% aggregate sessional marks in I- SEM
6	From 3/4 BE, II-SEM to 4/4 BE, I SEM	(a) Regular course of study of 3/4 B.E, II-SEM (b) Must have secured at least 50% of total credits prescribed for 3/4 B.E and passed in all the subjects 2/4 B.E.
7	From 4/4 BE, I-SEM to 4/4 BE, II-SEM	(a) Regular course of study of 4/4 B.E, I-SEMand 40% aggregate sessional marks in II- SEM

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17
B.E. III YEAR - I-Semester

S No	Code	Subject	Scheme of Instruction Periods per week				Scheme of Examination Duration in Hrs	Maximum Marks SEM Exam	Sessio nals	Credits
			L	T	D	P				
1	IT3010	Data Base Management Systems	3	1			3	70	30	3
2	IT3020	Digital Signal Processing	3	2			3	70	30	4
3	IT3030	Software Engineering	3	1			3	70	30	3
4	IT3040	Operating Systems	3	1			3	70	30	3
5	IT3050	Theory of Automata	3	1			3	70	30	3
6	IT3060	Web Technologies	3	1			3	70	30	3
7	IT3170	Finishing School: Technical skills	2				1 ½	35	15	1
8	HS3110	Finishing School III: Soft Skills	2				1 ½	35	15	1
9	HS3140	Human Values and Professional Ethics -II	2				1 ½	35	15	1
Practicals										
10	IT3071	DBMS Lab				3	3	50	25	2
11	IT3081	Operating Systems Lab				3	3	50	25	2
12	IT3095	Mini Project-III				3	-	-	25	1
		Total	**24**	**7**		**9**		625	300	**27**
		Grand Total	**40**					925		**27**

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
DATABASE MANAGEMENT SYSTEMS

Instruction:3+1Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : IT3010
Credits : 3	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	**Course Outcomes**
The course will enable the students to:	**At the end of the course student will be able to:**
The objective of the course is to explain the need of database for storing, accessing and updating the data, eliminate the redundant data, allow multiple users to be active at one time and protect the data from unauthorized access.	1. Identify the purpose of different database languages and data models. 2. Explain the operations of relational model using SQL. 3. Design the normalized data base using different normal forms. 4. Illustrate different indexing and hashing techniques. 5. Describe the concurrency control ,recovery techniques and NoSQL.

UNIT – I
Introduction: Overview, File System vs DBMS, Advantages of DBMS, Database System Applications, Relational Databases, Object – Based and Semi-structured Databases, Data Storage and Querying, Database Architecture, Database Users and jAdministrators.
Database Design and the E-R Model: Overviewof the Design Process,   The E-R Model, Constraints, E-R Diagrams, E–R Design Issues, Weak Entity Sets, Extended E-R Features, Reduction to Relational Schemas, Other Aspects of Database Design.

UNIT – II
Relational Model: Structure of Relational Databases, Fundamental Relational-Algebra Operations, Additional Relational – Algebra Operations, Extended Relational - Algebra Operations, Null Values, Modification of the Databases.
Structured Query Language: Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Complex Queries, Views, Modification of the Database, Joined Relations.

UNIT – III
Advanced SQL and PLSQL: SQL Data Types and Schemas, Integrity Constraints, Authorization, Embedded SQL, Dynamic SQL, ODBC and JDBC, Functions and Procedural Constructs, Recursive Queries, Cursors, Triggers and Active database.
Schema Refinement: Features of Good Relational Design, Functional-Dependency Theory, Decomposition Using Functional Dependencies, Normalization,First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal FormMulti-

valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT - IV
Indexing and Hashing: Basic Concepts, Ordered Indices, B+- Tree Index Files, B-Tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices, Index Definition in SQL.

Transactions: Transaction Concepts, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability.

UNIT – V
Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Insert and Delete Operations, Weak Levels of Consistency, Concurrency of Index Structures.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Aries, Log-Based Recovery, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Non-volatile Storage. Introduction to NoSQL.

Suggested Reading:

1. Abraham Silberschatz, Henry F Korth, S. Sudarshan, Database System Concepts, Sixth Edition, McGrah-Hill International Edition, 2010.
2. Ramakrishnan, Gehrke, Database Management Systems, Third Edition, McGrah-Hill International Edition, 2003.
3. Elmasri Navathe, Somayajulu, Fundamentals of Database System, Fourth Edition, Pearson Education, 2006.
4. Patric O'Neil, Elizabeth O'Neil, Database--principles, programming, and performance, Morgan Kaufmann Publishers, 2001.
5. Getting Started with NoSQL- Gaurav Vaish

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
DIGITAL SIGNAL PROCESSING

Instruction:3+2Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : IT3020
Credits : 4	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Understand various concepts of digital signal processing, design digital filters and analyse digital signal processor architectures.	1. Analyze the discrete time signals and systems using the concepts of Z transform and Fourier Transform. 2. Design and implement digital Finite Impulse Response (FIR) filters. 3. Design and implement digital Infinite Impulse Response (IIR) filters. 4. Analyze various architectural features of Digital Signal Processors. 5. Understand digital signal processors applications.

UNIT-I

Basic Elements and advantages of DSP, Discrete time signals and systems, Analysis of discrete time LTI systems, Discrete time system described by difference equation. Review of Z-transforms, Frequency domain sampling, Properties of DFT, Overlap-save method, overlap-add method, Efficient computation of DFT: FFT Algorithm, Direct computation of DFT, Radix-2 FFT Algorithm, MATLAB program for FFT Calculation.

UNIT-II

Design of FIR filters, characteristics of practical frequency selective filters, symmetric and anti symmetric FIR filters. Design of linear face FIR filters using windows. Design of optimum equi-ripple linear face FIR filters. Structure for the realization of discrete time systems: structure for FIR systems, direct form and cascade form structures.

UNIT-III

Design of IIR filters from analog filters. IIR filter design by impulse invariance, bilinear transformation. Butterworth filters, Chebyshev filters. Frequency transformation in analog and digital domains.
Structures for IIR systems: direct form, cascade form, parallel form. Representation of numbers, Round off effect in digital filters.

UNIT-IV

Architectures for Programmable DSP devices: Introduction, basic architectural features, DSP computational Building Blocks (Multiplier, Shifter, MAC Unit & ALU). Bus Architecture & Memory: On-chip memory, organization of on-chip memory, Data Addressing capabilities: Immediate addressing mode, register addressing mode, direct addressing mode, indirect addressing mode and Special addressing modes. Address generation Unit, Programmability & Program execution: Program Control, Program Sequence. Speed issues: Hardware architecture, parallelism, pipelining. Introduction to TMS320C54xx DSP processor, Bus structure, CPU, Data Addressing modes, Memory space.

UNIT-V

Applications of Programmable DSP devices, DSP based Bio-telemetry receiver, A speech Processing System and its implementation of TMS320C54xx processor, An Image Processing System: JPEG Algorithm, Encoding & Decoding Using TMS320C54xx.

Suggested Reading:

1. Proakis John G, Dimitris G. Manolakis, Digital Signal Processing, Third Edition, PHI 2005. (Units 1,2 &3).
2. Avtar Singh, S.Srinivasan, Digital Signal Processing Implementations Using DSP Microprocessors with Examples from TMS320C54xx, THOMSON BROOKS/COLE, 2004. (Units 4 & 5)
3. Jonathan (Y) Stein, Digital Signal Processing A Computer Science Perspective, WILEY-INDIA, 2000.
4. Vinay K. Ingle, John G. Proakis, Digital Signal Processing using MATLAB, THOMSON BROOKS/COLE, 2004.
5. Phil Lapsley, Jeff Bier, Amit Shoham, Edward Lee, DSP Processor Fundamentals: Architectures & Features, WILEY-INDIA, 1996.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
SOFTWARE ENGINEERING

Instruction: 3+1Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : IT3030
Credits : 3	Sessional Marks :30	Duration of Sem. Exam : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Understand the various SDLC models and stages in SDLC lifecycle.	1. Select the most suitable software process model out of several, for the development of a given software project. 2. Develop the ability to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project. 3. Learn the software design principles and understand how to apply them towards implementation. 4. Compare different ways and techniques of ensuring software quality and apply various test processes and techniques on conventional applications. 5. Use various estimation methods to estimate the effort required for a given project, develop an understanding of risks inherent to software development, and provide continuous quality improvement

UNIT I

Introduction to Software Engineering: Software Engineering, Process Framework, Process Patterns, Process Assessment, Personal and Team Process Models, Process Technology, Product and Process.

Process Models : Prescriptive Models, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, The Unified Process.

An Agile view of Process: What is Agility. What is an Agile Process, Agile Process Models.

UNIT II

Understanding requirements: Requirement Analysis, Data Modeling Concepts, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Oriented Modeling, Creating a Behavioral Modeling

Design Engineering: Design within the context of SE, Design Process, Design Concepts, The Design Model.

UNIT III
Architectural Design: Software Architecture, Architecture Genres, Architecture Styles, Architectural Design.
Component level Design: What is a Component,Designing Class-Based Components, Conducting Component-Level Design, Object Constraint Language, Designing Traditional Components, and Component-Based Development. **Performing User Interface Design :** The Golden rules, User Interface Analysis and Design, Interface Design Steps, Design Evaluation.

UNIT IV
Software Testing Strategies: A Strategic Approach to Software Testing, Strategic Issues, Validation Testing, System Testing, The Art of Debugging.
Testing Tactics: Software testing fundamentals, Black-box and White-box testing, Basis path testing, Control Structure testing.
Software Quality Assurance (SQA): Software Configuration Management, CMMI, ISO 9000 Quality Standards, Software Quality, Elements of Software Quality Assurance, SQA Tasks, Goals and Metrics, SQA Plan.

UNIT V
Product Metrics: A Framework for Product Metrics, Metrics for the Requirements Model, Metrics for the Design Model, Metrics for Testing, Metrics for Maintenance.
Estimation & Risk Management: Software Project Estimation, Decomposition Techniques, Empirical Estimation Models, Specialized Estimation Techniques, Software Risks, Reactive Vs Proactive Risk Strategies, Risk Mitigation, Monitoring and management, the RMMM Plan.

Suggested Reading:

1. Roger S.Pressman, Software Engineering: A Practitioners Approach, Seventh Edition, McGraHill, 2009.
2. Pankaj Jalote "An Integrated Approach to Software Engineering, Third Edition,
   Narosa Publishing house, 2008.
3. James F.Peters, Witold Pedrycz, Software Engineering-An engineering Approach, John
   Wiley Inc., 2000.
4. Ali Behforoz and Frederic J.Hadson, Software Engineering Fundamentals, Oxford University Press, 1997.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR3/4 B.E I- SEMESTER
OPERATING SYSTEMS

Instruction:3+1Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : IT3040
Credits : 3	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
This course gives an introduction to operating systems along with its major functionalities such as process management, memory management, storage, I/O management , protection and security .	1. Gain knowledge about structure and functionalities of operating systems along with an introduction to process and threads. 2. Compare different scheduling algorithms with respect to their turnaround time, response time and waiting time. 3. Compute the number of page faults for different page replacement algorithms. 4. Calculate the number of head movements using different disk scheduling algorithms. 5. Understand the goals of protection, various means of incorporating security along with different threats.

UNIT-I
Introduction: Operating System Functionalities, Computer Architecture support to Operating Systems. System Structures: User Operating System Interface, System calls. Operating System Generation, System Boot. Process Concept: Overview, Inter-Process Communication, Threads.

UNIT-II
Process Management: Process Scheduling - Uniprocessor scheduling algorithms, Multiprocessor and Real-time scheduling algorithms, Process Synchronization - Peterson's Solution, Bakery Algorithm, Hardware Support to Process Synchronization, Semaphores, Critical Section, Monitors. Deadlocks: Deadlock prevention, Deadlock avoidance and Deadlock Detection and Recovery - Bankers Algorithm.

UNIT-III
Memory Management: Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation.
Virtual Memory Management: Background, Demand Paging, Copy-on-Write, Page replacement algorithms, Analysis of page allocation policies - Working Set Model, Thrashing, Allocating Kernel Memory.

UNIT-IV

Storage and I/O Management: Introduction to File System, File System Structure, File System Mounting, Directory Structure. Allocation Methods: Contiguous, Sequential and Indexed Allocation, Free Space Management.I/O Management:Disk Structure, RAID Structure, Disk Scheduling, I/O Hardware, Application I/O Interface, Transforming I/O Request to Hardware Operations, Streams.

UNIT-V

Protection & Security: Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Capability Based Systems. Security Problem, Program Threats, System and System Network Threats, Cryptography as a security tool, User Authentication, Implementing Security Defences, Firewalling to Protect Systems and Networks.

Suggested Reading:
1. Operating System Concepts - Operating System Concepts, Sixth Edition, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, John Wiley & Sons Inc.

References:
1. Modern Operating Systems- Andrew S Tanenbaum, Prentice Hall
2. Operating Systems - Operating System: Internals and Design Principles (4th edition), William Stallings
3. Operating Systems - System Programming and Operating Systmes D M Dhamdhere, tata Mc Graw Hill
4. Operating Systems - Operating Systems: A Modern Perspective, 2/E, Gary Nutt, Addison Wesley
5. Operating Systems - Operating Systems, Achyut S Godbole, Tata Mc Graw Hill
6. Design of the Unix Operating System - Maurice Bach, Prentice Hall.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
THEORY OF AUTOMATA

Instruction:3+1Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : IT3050
Credits : 3	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objective:	**Course Outcomes:**
The course will enable the students to:	At the end of the course student will be able to:
Introduce central concepts in theory of computation and to design grammars and recognizers for different formal languages, and also to determine the decidability and intractability of computational problems.	1. Define basic concepts in formal language theory, automata theory, and able to design finite automata, RE's for a given language. 2. Define properties of RL's, Design grammars, minimize FA and also apply the concept of pumping lemma to prove that certain languages are not regular. 3. Design PDA's for various CFG's and CFL's, simplify the CFG's, define properties of CFL's. 4. Define programming techniques of Turing machines and design Turing machines for decidable problems 5. Apply mathematical and formal techniques for solving problems in computer science and also define concepts of computability theory, and complexity theory.

UNIT I

Finite Automata: Introduction to Finite Automata, Central Concepts of Automata Theory, Deterministic Finite Automata, Nondeterministic Finite Automata, NFA to DFA Conversion, Finite Automata with Epsilon Transitions, Equivalence between NFA with and without Epsilon Transitions.

Regular Expressions: Regular Expressions, Identity Rules for Regular Expressions, Algebraic Laws for Regular Expressions, Equivalence between Finite Automata and Regular Expressions, Applications of Finite Automata and Regular Expressions.

UNIT II

Properties of Regular Languages: Pumping Lemma for Regular Languages, Closure Properties of Regular Languages, Decision Properties of Regular Languages, Equivalence between two FSM's, Minimization of Finite Automata.

Context Free Grammars and Languages: Chomsky Hierarchy of Languages, Grammars and Languages Generated, Context-Free Grammars, Derivations, Parse Trees, Ambiguity in Grammars and Languages.

UNIT III

Pushdown Automata: Introduction, Formal Definition and Behavior of PDA, Language of PDA, Design of PDA, Equivalence of PDA's and CFG's, Introduction to DCFL and DPDA.

Properties of Context Free Languages: Simplification of CFG's, Normal Forms for Context-Free Grammars: CNF and GNF, Pumping Lemma for Context Free Languages, Closure Properties of Context Free Languages, Decision Properties of Context Free Languages.

UNIT IV

Turing Machines: Introduction, Formal Definition and Behavior of TM,TM as Acceptor and I/O device, Language of a TM, Design of TM's, Programming Techniques for Turing Machines, Extensions to the Turing Machines, Restricted Turing Machines.

UNIT V

Undecidability: Recursive and Recursively Enumerable Languages, Properties of Recursive and Recursively Enumerable Languages, The Church-Turing Thesis, A Language that is not Recursively Enumerable, An Undecidable Problem that is RE, Undecidable Problems about Turing Machines, PCP and MPCP.

Intractable Problems: The classes P and NP, An NP complete Problem, A Restricted Satisfiability Problem.

Suggested Reading:
1. John E.Hopcroft, Rajeev Motwani, Jeffery D Ulman, Introduction to Automata Theory Languages And Computation, Third edition, Pearson Education.
2. Theory of Computer Science- Automata languages and computation –Mishra and Chandrashekaran, Third edition, PHI
3. K.Krithivasan and R.Rama; Introduction to Formal Languages, Automata Theory and Computation; Pearson Education, 2009.
4. John C. Martin, Introduction to Languages and The Theory of computation, Third edition, Tata McGraw Hill, 2003.
5. Cohen Daniel I.E, Introduction to Computer Theory, Second edition, 2007.
6. Bemard Moret, The Theory of computation, Pearson Education, 2002.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
WEB TECHNOLOGIES

Instruction: 3+1Periods/ week	Sem. Exam Marks : 70	Subject Ref. Code : IT3060
Credits : 3	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Understand the ways of developing web sites using different technologies.	1. Design webpages using HTML, CSS and JavaScript. 2. Understand zurb foundation, Backbone.js and express.js. 3. Develop the programs using Python programming. 4. Develop the server side applications using Servlets and JSP. 5. Understand the concepts in PHP, access the database through web.

UNIT-I:

Introduction to Internet, World Wide Web, Web Browsers, Web Servers, Uniform Resource Locators, HTTP, Introduction to XHTML: Origins and Evolution of HTML and XHTML, Standard XHTML document structure, Basic Text Markup, Images, Hypertext Links, Lists, Tables, Frames. Cascading Style Sheets: Text Styles, Types of Style Classes, Block Styles, page layout with CSS. Basics of JavaScript: HTML forms - Overview of Java Script-Primitives, Operations and Expressions-Control Statements, Arrays, Functions, DOM, Element access in JavaScript, Events and event handling.

UNIT-II:

Twitter Bootstrap: The Grid System, Layout components, Zurb Foundation: The Grid, Global styles, basic controls, Backbone.js: Models, Views, Collections, express.js, Application Development.

UNIT-III:

Python: Basics of python, Variables and types, Lists, Operators, Strings formatting, String operations, conditions, loops, functions, objects and classes, dictionaries, modules and packages.

Advanced python: generators, list comprehensions, multiple function arguments, regular expressions, exception handling, sets, serialization using JSON and pickle, partial functions, code introspection, compression, encoding and decoding ,decorators, frameworks.

UNIT-IV:

Java Servlets: Java Servlets and CGI Programming, Benefits of Java Servlet, Life cycle of Java Servlet, Reading data from client, HTTP Request header, HTTP Response header, working with cookies, Tracking Sessions. Java Server Pages: Introduction to

JSP, JSP Tags, Variables and Objects, Methods, Control Statements, Loops, Request String, User Sessions, Session Object, Cookies.

UNIT-V:
Introduction to PHP: Overview of PHP, General Syntactic Characteristics, Primitives, Operations, Expressions, Control Statements, Arrays, Functions, Pattern matching, Form handling, Files, Cookies, Session Tracking. Database access Through Web: Architectures for Database Access- Database access with Perl - Database access with PHP-Database access with PDO.

Suggested Reading:

1. Robert W.Sebesta, *Programming the world wide web*, Fourth Edition, Pearson Education,2008.
2. Learning Zurb Foundation by Kevin Horek, 2014
3. Learning Python, 5th Edition, O'reilly
4. Jim Keogh, *The Complete Reference J2EE*,Tata-McGraw-Hill,2002.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
FINISHINF SCHOOL-III: TECHNICAL SKILLS(C,C++,JAVA,DS)

Instruction: 2 Periods / week	Sem. Exam Marks : 35	Subject Ref. Code : IT3170
Credits : 1	Sessional Marks : 15	Duration of Sem. Exam : 1.5 Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
The objective of the course is to Possess necessary skills to implement solution in C and Object Oriented Concepts for a given problem and efficient storage mechanisms for an easy access and design and implement various data structures and improve logical ability.	1. To select appropriate concept in C programming language to develop programs(knowledge & analysis) 2. Demonstrate the principles of the object oriented programming. 3. Create packages. Handle errors using Exception Handling, and create threads using Multithreaded Programming concepts. 4. Apply the concepts of classes present in lang,IO package . 5. Demonstrate the applications of Data Structures.

UNIT – I
Review of C Programming Language: Identifiers, Types, Variables, Evaluating Expressions, Type Conversion, Statements, Selection, Repetition, Functions, Arrays, Pointers:, Strings, Structure.

UNIT-II
Introduction to C++: Programming paradigms, Object oriented programming concepts, Advantages and Applications of OOPs. Functions, Inheritance, Exception handling. Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development. Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control statements, Classes, Methods, Inheritance

UNIT- III
Packages and Interfaces, Exception Handling, Multithreaded Programming,
I/O basics, Reading console input and output, Reading and Writing Files, String Handling.

UNIT - IV
Exploring Java Language, Util,I/O,Awt,Applets,Swings

UNIT – V
Review of Data Structures:Stacks and Queues,Linked Lists,Trees,Graphs

Suggested Reading:

1. Test your C Skills Yashavant P. Kanetkar
2. Yashwant Kanetkar test your c++ skills
3. Yashwant Kanetkar test your java skills
4. Herbert Schildt, The Complete Reference Java,7thEd, Tata McGraw Hill, 2006.
5. Data structure through C++ yashwant kanetkar
6. Effective C++ and More Effective C++ by Scott Meyers

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
FINISHINF SCHOOL-III: SOFT SKILLS

Instruction : 2 Periods/ week	Sem. Exam Marks: 35	Subject Ref. Code: HS 3110
Credits :1	Sessional Marks: 15	Duration of Sem. Exam : 1.5 Hrs.

Course Objective:	Course Outcomes
This is a foundation course and aims at enhancing employability skills in students. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning. Students will be trained to work systematically with speed and accuracy while problem solving. The three major areas covered in this course include 1. Numerical Ability 2. Arithmetic Ability 3. General reasoning	**At the end of the course students will be able to:** • Solve questions on the above mentioned areas using short cuts and smart methods • Understand the fundamentals concepts of Aptitude skills • Perform calculations with speed and accuracy

UNIT – I : QUANTITATIVE APTITUDE - NUMERICAL ABILITY
- Numerical Ability
- Introduction to higher order thinking skills
- Speed Maths
- Number systems
- LCM & HCF

UNIT – II: QUANTITATIVE APTITUDE-ARITHMETIC ABILITY FOUNDATION
- Arithmetic Ability
- Percentage
- Profit loss and discounts
- Ratio proportions Allegations and mixtures
- Averages

UNIT – III: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED
- Arithmetic Ability
- Time speed and distance
- Time and work
- Interest calculations

UNIT – IV: REASONING ABILITY – GENERAL REASONING PART 1
- General Reasoning
- Coding decoding
- Directions
- Series completions

UNIT – V: REASONING ABILITY- GENERAL REASONING PART 2
- General Reasoning

- Analogies
- Classification
- Alphabet test
- Mathematical operations

With effect from the A.Y 2016-17

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR B.E. 3/4 FIRST SEMESTER
HUMAN VALUES AND PROFESSIONAL ETHICS-II

Instruction : 2 Periods/ week	Sem Exam Marks - 70	Subject Reference Code : HS3140
Credits : 1	Sessional Marks -30	Duration of SemExam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to	Students will be able to
• Get a holistic perspective of value- based education. • Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations. • Understand professionalism in harmony with self and society. • Develop ethical human conduct and professional competence. • Enrich their interactions with the world around, both professional and personal.	• Gain a world view of the self, the society and the profession. • Make informed decisions. • Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals • Inculcate Human values into their profession.

1. **Distinction between need and greed:**Exercising the wisdom to distinguish need from greed

2. **Rights and Responsibilities**-Educating an individual about rights and responsibilities –Safeguards-Stimulants-Social Justice-The three catalysts for deciding rights and responsibilities.

3. **Imbibing and inculcating Civic Sense and Civic-Virtues**, The true meaning of Integrity -Honesty, Humility, Openness, Transparency, Dedication, Reliability, Confidentiality, accountability, Collegiality, Sympathy, Trustworthiness, Co-operation, Courage.
   a. The moral dilemma of the Modern world, Respect for Self, Others and Work.
   b. Respect for women at all times especially at the workplace.
4. **Ideal self-Real self**- How to define the ideal-idealism at various levels- is it possible to reach idealism –Man as a pilgrim on a journey to idealism
5. **Managing Failure**-Identifying causes for failure and learning lessons-Using failure to score success-Role of self-confidence and personal ethics in coping with failure.

• Anger/ Depression	• Cruelty
• Fear	• Jealousy
• Agitation	• Desire
• Failure	• Cheating
• Lethargy	• Pride
• Dishonesty	• Greed
	• Lying

6. **Stress Management**- Identifying sources and levels of stress –Tackling stress and its associated negativity-Positive aspect of coping with stress-Some techniques to manage stress.

7**. Developing Emotional Intelligence**
> Self-Awareness
> Handling Emotions
> Motivation
> Empathy
> Social skills

- Validate their aspirations through right understanding of human relationship and see the co-relation between the human values and prevailing problems.
- Strike a balance between physical, mental, emotional and spiritual parts their being.
- Obtain a holistic vision about value-based education and professional ethics.

Learning Resources
1. B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
2. A.N Tripathy, 2003 Human values, New Age International Publishers.
3. EG Seebauer & Robert L. Berry,2000,Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
4. Mike Martin and Ronald Schinzinger "Ethics in Engineering "McGraw Hill
5. Charles E Haris, Micheal J Rabins, " Engineering Ethics "Cengage Learning
6. Caroline whitback Ethics in Engineering Practice and Research, Cambridge University Press
7. Georgs Reynolds, Ethics in Information Technology", Cengage Learning
8. Charles D.Fleddermann, " Engineering Ethics", Pearson Education /Prentice Hall, New Jersey,2004 (Indian Reprint)

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
DBMS LAB

Instruction: 3 Periods / week	**Sem. Exam Marks** : 50	**Subject Ref. Code** :IT3071
Credits : 2	**Sessional Marks** : 25	**Duration of Sem. Exam** : 3 Hrs

Course Objective:	**Course Outcomes:**
The course will enable students to:	At the end of the course student will be able to:
The object of the course is to create database to educate students with fundamental concepts of Data Base Design, Data Models, Different Database Languages (SQL/Oracle)	1. Write and execute simple, complex queries using SQL and PLSQL. 2. Create triggers and stored procedures. 3. Create forms, reports and security features.

1. SQL
    - Creating Database (Exercising Commands like DDL,DML,DCL)
    - Exercising all types of Joins.
    - Creating tables in 1st Normal Form, 2nd Normal Form, 3rd Normal Form and BCNF
    - Creating Tables using combination of constraints.
    - Exercising Simple to Complex Queries.
    - Usage of stored functions.
    - Usage of Table locking facilities in applications.

2. PL/SQL
    - Demonstration of Blocks, Cursors ,Procedures.
    - Demonstrating Exception Handling.
    - Usage of Triggers to perform operation on single and multiple tables.
    - PL/SQL procedures for data validation.

3. FORMS
    - Creation of forms for college information system, library information system and Recruitment cell

4. REPORTS
    - Creation of reports based on different queries.
    - Creation of small full pledged database application spreading over to 3 sessions.

Suggested Reading:

1. Nilesh Shah , Database System Using Oracle, PHI, 2007.
2. Rick F Vander Lans, Introduction to SQL, Fourth edition, Pearson Education,2007.
3. Benjamin Rosenzweig, Elena Silvestrova, Oracle PL/SQL by Example, Third edition, Pearson Education, 2004.
4. Albert Lulushi, Oracle Forms Developer's Handbook, Pearson Education, 2006.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
OPERATING SYSTEMS LAB

Instruction: 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : IT3081
Credits : 2	Sessional Marks : 25	Duration of Sem. Exam : 3 Hrs

Course Objective:	Course Outcomes:
The course will enable students to:	At the end of the course student will be able to:
The objective of this course is to gain practical experience with designing and implementing concepts of operating systems such as system calls, CPU scheduling, process management, memory management, file systems and deadlock handling using C language in Linux environment.	1. Understand and implement basic services and functionalities of the operating system using system calls, Using modern operating system calls. 2. Understand the benefits of Process Synchronization and deadlock management. 3. Analyze and simulate CPU Scheduling Algorithms & Memory Management Schemes.

1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir

2.   Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)

3. Write C programs to simulate UNIX commands like ls, grep, etc.

4. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.

5.   Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.

6. Write a C program to simulate Bankers algorithm for the purpose of deadlock avoidance.

7.   Developing Application using Inter Process communication (using shared memory, pipes or message queues)

8. Implement Process Synchronization problems using Monitors and Semaphores.

9. Implement the Producer – Consumer problem using semaphores (Threads).

10. Implement some Memory management schemes like Paging and Segmentation.

11. Implement any file allocation techniques(Contiguous, Linked or Indexed)

12. Write a C program to simulate the following contiguous memory allocation techniques a) Worst-fit b) Best-fit c) First-fit.

Suggested Reading:

1. W. Richard Stevens, Unix Network Programming, Prentice Hall/Pearson Education,2009.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E I- SEMESTER
MINIPROJECT-III

Instruction: 3 Periods / week	Sessional Marks : 25
Credits : 1	Subject Ref. Code : IT3095

Course Objective:	**Course Outcomes:**
The course will enable students to:	At the end of the course student will be able to:
Develop and implement a project using any of the programming languages/simulation tools / electronic components.	1. Develop solutions to various computing problems by applying the theoretical knowledge gained. 2. Implement projects and demonstrate them using presentations and technical reports

- The students are required to implement a project (hardware / software related) from project exercises given in the suggested readings and reference books of the theory subjects.
- During the implementation of the projects, Personnel Software Process (PSP) has to be followed.
- Review(s) will be conducted.
- Report of the project work has to be submitted for evaluation.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTION AND EXAMINATION W.E.F 2016-17
B.E. III YEAR - II-Semester

S No	Code	Subject	Scheme of Instruction Periods per week				Scheme of Examination Duration in Hrs	Maximum Marks Sem Exam	Sessi-onals	Credits
			L	T	D	P				
1	HS3010	Managerial Economics & Accountancy	4				3	70	30	3
2	IT3100	Compiler Construction	3	1			3	70	30	3
3	IT3110	Computer Networks	3	1			3	70	30	3
4	IT3120	Data Warehousing & Data Mining	3	2			3	70	30	4
5	IT3130	Object Oriented System Development	3	1			3	70	30	3
6	IT3180	Finishing School – IV: Technical skills	2				1 ½	35	15	1
7	HS3210	Finishing School – IV : Soft Skills -II	2				1 ½	35	15	1
Practicals										
8	IT3141	Network Programming Lab				3	3	50	25	2
9	IT3151	OOSD & CC Lab				3	3	50	25	
10	IT3165	Mini Project-IV				3	-	-	25	1
		Total	20	5		9		520	255	21
		Grand Total	34					775		21

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
MANAGERIAL ECONOMICS & ACCOUNTANCY

Instruction: 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : HS3010
Credits : 3	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	Course Outcomes
The Course will enable the learners to:	At the end of the course the learners should be able to:
1. Create an awareness about the significance of economics in day to day life and its impact of policies of organizations'. 2. Helps in engineering the products according to the societal needs 3. Helps in leaning the investment decision making 4. Understand the economical ways of production and pricing the products based on the market structures 5. Analyse the performance of companies	1. Make decisions in solving the economic problems of the organization 2. Make better sale of the product with customer centered products and services 3. Make economical production by identifying the optimum combination of inputs and price them appropriately for better profits 4. Understand the process of making long term investment decisions involving huge outlay 5. Analyse the past performance of the company and make decisions for future 6. Competent to set up own enterprise.

UNIT - I
Meaning and Nature of Managerial Economics: Branches of economics – micro and macro, Managerial Economics – nature, scope, importance, relation with other sciences and its usefulness to Engineers, Fundamental Concepts of Managerial Economics - Scarcity, Marginalism, Equi-marginalism, opportunity costs, Discounting, Time Perspective, Risk and Uncertainty, Profits, Case study method.

UNIT - II
Consumer Behaviour: Demand – concept, Determinants, Law of demand, relationship between total revenue, marginal revenue and demand, Elasticity of Demand (Price, Income Cross-Elasticity and advertising elasticity); Demand forecasting, Law of Supply, concept of Equilibrium. (Theory questions and small numerical problems on measurement of arc and point elasticity can be asked).

UNIT - III
Theory of Production and Markets: Production Function, Law of Variable Proportion, Isoquants, Economies of Scale, Cost analysis - cost concepts, Cost-Output relationship,
Optimization of employment of inputs, Break-Even Analysis, market structures – types, Price-Output determination under Perfect Competition and Monopoly (theory and problems can be asked on breakeven point).

UNIT - IV

Capital Management: Significance, Introduction to capital budgeting, traditional methods and discounted cash flow methods, determination and estimation of working capital requirements, sources of capital, (Theory questions and numerical problems on estimating working capital requirements and evaluation of capital budgeting opportunities can be asked).

UNIT - V

Book-Keeping: Principles of Double entry system of Book keeping, Journal, Three column cash book and petty cash book, Bank reconciliation statement, Trial Balance, Preparation of Final Accounts with simple adjustments, Analysis and interpretation of Financial Statements through Ratios (liquidity, solvency and profitability ratios).

(theory questions and numerical problems on preparation of final accounts, cash book, petty cash book, bank reconciliation statement, calculation of some ratios and analysis).

LEARNING RESOURCES:

Text Books:
1. Mehta P.L., "Managerial Economics – Analysis, Problems and Cases", Sulthan Chand & Son's Educational publishers, 2011.
2. Maheswari S. N. "Introduction to Accountancy", Vikas Publishing House, 2005.
3. Financial Management by Khan & Jain. Mc. Graw Hill Education
4. W. Chris lewis & Craig H Petersen "Managerial economics".
5. Modern Accounting by A. Mukherjee & M.Hanif

Reference Books:
1. Micro Economics by M. L.Seth.
2. Financial Accounting by Jain & Narang.
3. Panday I.M. "Financial Management" Vikas Publishing House, 2009.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
COMPILER CONSTRUCTION

Instruction: 3+1Periods/ week	Sem. Exam Marks : 70	Subject Ref. Code : IT3100
Credits : 3	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objective:	Course Outcomes:
The course will enable the students to:	At the end of the course student will be able to:
Introduce the major concept areas of language translation, and to enrich the knowledge in various phases of compiler and its use.	1. Define the purpose and implementation approach of each phase, in particular, the lexical analysis, syntax, and semantic analysis, code generation and optimization phases of compilation, and also apply the knowledge of LEX tool to develop a Scanner. 2. Identify the similarities and differences among various parsing techniques and grammar transformation techniques, and implement various techniques to parse source code, and also apply the knowledge of YACC tool to develop a Parser. 3. Implement semantic rules and use formal attributed grammars for specifying the syntax and semantics of programming languages, and also transform an AST to intermediate representation. 4. Apply various optimization techniques on the Intermediate Representation. 5. Generate target code from Intermediate Representation.

UNIT-I
Introduction to Compilers: Introduction, Language Processors, The Structure of a Compiler- Analysis and Synthesis Phases, **Lexical Analysis** – The Role of Lexical Analyzer, Input Buffering, Specification of Tokens using Regular Expressions, Recognition of Tokens using Finite Automaton, The Lexical-Analyzer Generator-LEX.

UNIT-II
Syntax Analysis: Introduction, Context-Free Grammars, **Top-Down Parsing**: Recursive Descent Parsing, Predictive Parsing, LL(1) Grammars, **Bottom-Up Parsing:** Shift-Reduce Parsing, Operator Precedence Parsing, Introduction to LR Parsing- SLR, More Powerful LR Parsers- CLR and LALR, Using Ambiguous Grammars, The Parser Generator- YACC.

UNIT-III
Syntax Directed Translation: Introduction, Syntax Directed Definitions, Evaluation Orders for SDD's, Applications of Syntax Directed Translation.
Intermediate Code Generation: Variants of Syntax Trees, Three-Address Code, Types and Declarations, Translation of Expressions, Type Checking.

UNIT-IV
Run-Time Environments: Storage Organization, Stack Allocation of Space, Access to Non-local Data on the Stack, Heap Management, Introduction to Garbage Collection.
Code Optimization: Introduction, Basic Blocks and Flow Graphs, Optimization of Basic Blocks, Machine Independent Optimizations – The Principal Sources of Optimizations, DAG Representation of Basic Blocks.

UNIT-V
Code Generation: Introduction, Issues in the Design of a Code Generator, The Target Machine, A Simple Code Generator, Peephole Optimization, Register Allocation and Assignment, DAG for Register Allocation.

Suggested Reading:
1) Alfred V Aho, Monica S Lam, Ravi Sethi, Jeffrey D Ullman – *Compilers: Principles, Techniques &Tools* – Pearson Education, Second Edition, 2007
2) Leland L Bech, *System Software: An Introduction to Systems Programming*, Pearson Education Asia, 1997.
3) Kenneth C. Louden, *Compiler Construction: Principles and Practice*, Thompson Learning, 2003.
4) J.P. Bennet, *Introduction to Compiler Techniques*, Second Edition, Tata McGraw-Hill, 2003.
5) Keith D Cooper and Linda Torczon, *"Engineering a Compiler"*, Morgan Kaufmann Publishers Elsevier Science, 2004.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
COMPUTER NETWORKS

Instruction: 3+1Periods/week	Sem. Exam Marks : 70	Subject Ref. Code : IT3110
Credits : 3	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	**Course Outcomes**
The course will enable the students to:	At the end of the course student will be able to:
Understand the fundamental concepts of computer networks and Socket programming, know the role of various layers and protocols for computer networks and introduce internet services and security policies.	1. Identify the different types of network topologies and protocols, networking devices, reference models and network programming concepts. 2. Understand the routing algorithm, congestion control algorithm and transport layer concepts. 3. Understand the network layer protocols in internet. 4. Develop solutions for Application layer concepts 5. Understand the cryptographic methods and algorithms.

UNI T-I
Introduction: Uses of Computer Networks, Network Hardware, Network Software: Reference Models (ISO -OSI, TCP/IP).
Network Programming: Socket Interface: Sockets, Socket Address, Elementary Sockets, Advanced Sockets, Socket Options, Out of Band Data, Daemon process and Internet Super Server.
Remote Procedure Calls: Introduction, Transparency Issues and Sun RPC.

UNI T-II
Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service.
Internetworking: Concatenated virtual circuits, Connectionless Internetworking, Tunneling, Internetwork routing, Fragmentation.

UNIT-III
Network layer in the Internet: Internet Protocol, IPv4, IPv6, Interoperability of IPv4 and IPv6, IP addresses, Internet Control protocols, OSPF, BGP, Internet Multicasting, Mobile IP.
Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, Internet Transport Protocols - TCP.

UNIT-IV
Application Layer: Domain Name System: DNS Name Space, Resource Records, Name Servers.
Electronic Mail: Architecture and Services, User Agent, Message Formats, Message transfer and Final Delivery.
World Wide Web: Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP, Wireless Web.
Multimedia: Digital Audio, Streaming Audio, Voice over IP, Video on Demand.

UNIT-V
Network Security: Cryptography, Symmetric Key Algorithms, Public Key Algorithms, Digital Signatures, Management of Public Keys, Communication Security, Authentication Protocols, E-mail Security, Web Security.

Learning Resources:
1. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, 5th Edition, Pearson, 2012
2. W. Richard Stevens, "Unix Network Programming" Prentice Hall/Pearson Education, 2009.
3. James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, 5th Edition, Addison-Wesley, 2012
4. William Stallings, "Computer Networking with Internet Protocols and Technology", Pearson Education, 2004.
5. Chwan-Hwa (John) Wu, J. David Irwin, Introduction to Computer Networks and Cyber Security, CRC Press, 2013
6. W. Richard Stevens, Andrew M Rudoff, Bill Fenner, Unix Network Programming: Networking APIs: Sockets and XTI (Volume 1) 3rd Edition, PHI

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
DATA WAREHOUSING & DATA MINING

Instruction:3+2Periods/week	Sem. Exam Marks : 70	Subject Ref. Code : IT3120
Credits : 4	Sessional Marks : 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Explain the need of Data Mining concepts and techniques for uncovering interesting data patterns hidden in large data sets.	1. Preprocess the data summarize the data,integrate the data,transform the data using the data mining functions. 2. Perform various kinds of association rules and mine the data using these rules. 3. Classify the data and predict the occurance of data using decision trees. 4. Do the cluster analysis by using the density and grid based methods. 5. Do the mining of multimedia text and word wide web.

Unit – I
Introduction: What is Data Mining, Data Mining Functionalities, Classification of Data Mining Systems, Major Issues in Data Mining.
Data Preprocessing: Preprocessing, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

Unit – II
Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture and Implementation, from Data Warehousing to Data Mining.
Mining Frequent Patterns, Associations Rules: Basic Concepts, Efficient and Scalable Frequent Item Set Mining Methods, Mining Various kinds of Association Rules.

Unit – III
Classification and Prediction: Introduction, Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule based Classification, Classification by Back Propagation, Associative classification, Prediction, Evaluating the Accuracy of a Classifier or Predictor.

Unit – IV
Cluster Analysis: Introduction, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid Based Methods, Model Based Clustering Methods, Outlier Analysis.

Unit – V

Mining Object, Spatial, Multimedia, Text, and Web Data: Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

Mining Streams, Time-Series, and Sequence Data: Mining Data Streams, Mining Time-Series Data, and Mining Sequence Patterns in Transactional Databases and Biological Data:

Suggested Reading:
1. Han J & Kamber M, Data Mining: Concepts and Techniques, Third Edition, Elsiver, 2011.
2. Pang-Ning Tan, Michael Steinback, Vipin Kumar, Introduction to Data Mining, Pearson Education, 2008.
3. Arun K Pujari, Data mining Techniques, Second Edition, University Press,2001.
4. Margaret H Dunham, S.Sridhar, Data mining: Introductory and Advanced Topics, Pearson Education, 2008.
5. Humphires, Hawkins, Dy, Data Warehousing: Architecture and Implementation, Pearson Education, 2009.
6. Anahory, Murray, Data Warehousing in the Real World, Pearson Education, 2008.
7. Kargupta, Joshi,etc., Data Mining: Next Generation Challenges and Future Directions, Prentice Hall of India Pvt Ltd, 2007.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
OBJECT ORIENTED SYSTEM DEVELOPMENT

Instruction:3+1 Periods/week	**Sem. Exam Marks** : 70	**Subject Ref. Code** :IT3130
Credits : 3	**Sessional Marks** : 30	**Duration of Sem. Exam** : 3 Hrs

Course Objective:	**Course Outcomes:**
The course will enable the students to	At the end of the course student will be able to:
Highlighting the importance of object-oriented system and development, showing how we apply the process of object-oriented analysis and design to software development, gain necessary knowledge and skills in using object-oriented CASE tools	1. List the features of Unified process and formal design processes. 2. Take part in different phases of Object-Oriented Analysis and Design 3. Apply unified modeling language constructs for developing structural design of a given project. 4. Explain the object behavior modeling principles and apply them towards implementation 5. Develop architecture models using various mechanisms of unified modeling language.

UNIT-I
UML Introduction: Why we Model, Introducing the UML, Elements of UML.
Basic Structural Modeling: Classes, Relationships, Common Mechanisms, Diagrams, Class Diagrams.
Advanced Structural Modeling: Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages, Instances, Object Diagrams, Components.

UNIT-II
Basic Behavioral Modeling: Interactions, Use Cases, Use Case Diagrams, Interaction diagrams, Activity diagrams.
Advanced Behavioral Modeling: Events and Signals, State Machines, Processes and Threads, Time and space, State Chart Diagrams.

UNIT-III
Architectural Modeling: Artifacts, Deployment Collaborations, Patterns and Frame-works, Artifact Diagrams, Deployment Diagrams, Systems and Models.

UNIT-IV
Unified Software Development Process: The Unified Process, The Four Ps, A Use-Case-Driven Process, An Architecture-Centric Processes, An Iterative and Incremental Process.

UNIT-V
Core Workflows: Requirements Capture, Capturing Requirements as Use Cases, Analysis, Design, Implementation, Test.

Suggested Reading:

1. Grady Booch, James Rumbaugh, Ivor Jacobson, The Unified Modeling Language-User Guide(Covering UML 2.0), Second Edition, Pearson Education, India,2007.
2. Ivor Jacobson, Grady Booch, James Rumbaugh, The Unified Software Development Process, Pearson Education, India, 2008.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
FINISHING SCHOOL-IV: TECHNICAL SKILLS

Instruction: 2 Periods / week	Sem. Exam Marks : 35	Subject Ref. Code : IT3180
Credits : 1	Sessional Marks : 15	Duration of Sem. Exam : 1 ½ Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
This Course is intended for System Architect candidates who want to create Pega 7 Case-Managementsolutions.	1. Use PRPC tools and technology to rapidly prototype a simple case-management application. 2. Create case stages and steps, implement processes, define properties, create a user interface, and create business rules and processes. 3. Use and create Declare Expression Rules and use Declarative Rules Inspector. 4. Implement business policies with decision rules. 5. Define best practices and design patterns for implementing case-based business applications.

PRPC: System Architect Essentials – I

UNIT I

BPM and Case Management Overview, Start Building an Application, Defining the Process.

UNIT II

(Modules being considered from BAE 7.1 Pega Academy Course)Pega Overview, Application Planning, (Modules being considered from DCO Essentials 7.1 course)Getting from Vision to Reality, Conducting a DCO Session, (SAE –I Course Resumes)Defining the Data Elements, Enhancing the User Interface.

UNIT III

Accessing Data in the Application, Automating Business Policies, Advanced Case Processing, Documenting the Application.

PRPC: System Architect Essentials – II

UNIT IV

SAE II- Orientation, Effective Application Development with PRPC, Designing Enterprise Applications Using Case Management, Creating an Effective Data Model, Integrating with External Data Sources.

UNIT V

Creating Engaging User Experiences, Enforcing Business Policies, Process Visibility through Business Reporting, Best Practices for Preparing an Application for Testing Deployment.

Reference:

1. https://pdn.pega.com/

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
FINISHING SCHOOL – IV : SOFT SKILLS

Instruction: 2 Periods per week	Sessionals:15Marks	SEM Exam Marks:30 Marks
Credits:01	SEM Exam Duration:3 Hrs	Subject Ref Code: HS3210

Course Objective:	**Course Outcomes**
This course aims at enhancing the employability skills. Students will be trained in higher order thinking skills including analytical skills, problem solving skills and critical & logical reasoning skills. Students will be trained to work systematically and develop logical and analytical thinking. Students will be trained in the following areas 1. Critical and Non verbal reasoning 2. Pure Maths 3. Verbal ability 4. Logical reasoning 5. Data Interpretation and Analysis	**At the end of the course students will be able to:** • Understand the fundamentals concepts of Aptitude and verbal skills • Solve questions using short cuts and smart methods • Perform calculations with speed and accuracy • Develop Analytical thinking and problem solving skills

UNIT 1 VERBAL ABILITY
- Finding errors
- Vocabulary
- Synonyms
- Antonyms
- Idioms and Phrases
- Fill in the blanks and sentence Jumbles
- Reading comprehension

UNIT 2 LOGICAL REASONING
- Logical Reasoning
- Assignments
- Puzzles
- Blood relations
- Syllogisms

UNIT 3 CRITICAL AND NON VERBAL REASONING
- Critical Reasoning
- Non verbal reasoning
- Figure series and completions

UNIT 4 QUANTITATIVE APTITUDE - PURE MATHS
- Pure maths

- Algebra
- Probability
- Permutations and combinations

UNIT 5 DATA INTERPRETATION AND ANALYSIS
- Data Interpretation
- Line graph
- Pie chart
- Bar Graph
- Tabulation

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
NETWORK PROGRAMMING LAB

Instruction: 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : IT3141
Credits : 2	Sessional Marks : 25	Duration of Sem. Exam : 3 Hrs

Course Objective:	Course Outcomes:
The course will enable students to:	At the end of the course student will be able to:
understand the use of client/server architecture in application development, use elementary socket system calls, advanced socket system calls and Java Socket API, how to use TCP and UDP based sockets and to implement network routing algorithms, application layer protocols and encryption algorithms.	1. Use network programming concepts to develop and implement distributed applications. 2. Develop and implement next generation protocols required for emerging applications. 3. Implementation of Public Key Algorithm.

1. Understanding and using of commands like ifconfig, netstat, ping, arp, telnet, ftp, finger, traceroute, whoisetc. Usage of elementary socket system calls (socket(), bind(), listen(), accept(),connect(),send(),recv(),sendto(),recvfrom()).
2. Implementation of Connection oriented concurrent & iterative service (TCP).
3. Implementation of Connectionless concurrent & Iterative service (UDP).
4. Demonstrate the use of advanced socket system calls.
5. Implementation of remote command execution using socket system calls.
6. Implementation of Distance Vector Routing Algorithm.
7. Implementation of SMTP.
8. Implementation of FTP.
9. Implementation of HTTP.
10. Implementation of RSA algorithm.

Note: Implement programs 2 to 5 in C and 8 to 10 in Java.

Suggested Reading:
1. W. Richard Stevens, "Unix Network Programming", Prentice Hall, Pearson Education, 2009.
2. Douglas E.Comer, "Hands-on Networking with Internet Technologies", Pearson Education.

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
OOSD & CC LAB

Instruction: 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : IT3151
Credits : 2	Sessional Marks : 25	Duration of Sem. Exam : 3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Apply unified modeling language constructs for developing structural design and various test cases of a project, implement powerful Compiler Construction tools and to implement front end of the compiler by means of generating Intermediate codes and to implement code optimization techniques, code generation techniques.	1. Apply the knowledge of LEX tool & YACC tool to develop a scanner & parser. 2. Develop programs for solving problems related to parsers. 3. Create programs for intermediate code generation and optimization. 4. Create visual specification of all work products required in various phases of software system development. 5. Generate and run test cases for various levels of testing by applying different testing methods.

CC LAB: Exercises must be taken from 1 to 7
OOSD LAB: Exercises must be taken from 8 to 14

1. Standalone lexical analyzer program using C
2. Scanner program using LEX tool
3. Implementation of predective parser
4. Implementation of SLR parser
5. Parser Generation using YACC
6. Program on Code Generation
7. Program on Code Optimization
8. System Definition
    a) Requirements Management
    b) Data Modeling
9. Design Modeling
    a) Use case Diagram
    b) Class Diagram
    c) Sequence Diagram
    d) Collaboration Diagram
    e) State Chart Diagram
    f) Activity Diagram
    g) Component Diagram
    h) Deployment Diagram

10. Software Development
    a) Application & Web modeling
    b) Configuration Management
    c) Unit Testing
11. Content Management
12. System Testing
    a) Functional Testing
    b) Reliability Testing
    c) Performance Testing
    d) Defect & Change Tracking
13. Change Management
    a) Configuration Management
    b) Requirement Management
    c) System Documentation
14. Project Management

DEPARTMENT OF INFORMATION TECHNOLOGY
SYLLABUS FOR 3/4 B.E II- SEMESTER
MINIPROJECT-IV

Instruction: 3 Periods / week	**Subject Ref. Code** :IT3165
Credits : 1	**Sessional Marks** : 25

Course Objective:	**Course Outcomes:**
The course will enable students to:	At the end of the course student will be able to:
Develop and implement a project using any of the programming languages/simulation tools / electronic components.	1. Develop solutions to various computing problems by applying the theoretical knowledge gained. 2. Implement projects and demonstrate them using presentations and technical reports

- The students are required to implement a project (hardware / software related) from project exercises given in the suggested readings and reference books of the theory subjects.
- During the implementation of the projects, Personnel Software Process (PSP) has to be followed.
- Review(s) will be conducted.
- Report of the project work has to be submitted for evaluation.