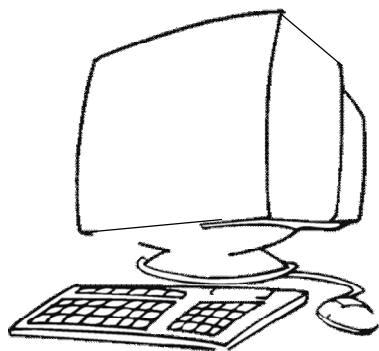


**VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)**  
**Ibrahimbagh, Hyderabad-31**  
Approved by A.I.C.T.E., New Delhi and  
Affiliated to Osmania University, Hyderabad-07

**Sponsored by**  
**VASAVI ACADEMY OF EDUCATION**  
**Hyderabad**



**STUDENT HAND BOOK**  
**Academic Regulations (Autonomous) and Syllabi of**  
**THIRD YEAR B.E(CSE) w.e.f 2016-17**



**DEPARTMENT OF COMPUTER SCIENCE ENGINEERING**  
**+91-40-23146020, 23146021**  
**Fax: +91-40-23146090**  
**Website: [www.vce.ac.in](http://www.vce.ac.in)**

## **DEPARTMENT VISION**

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals.

## **DEPARTMENT MISSION**

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

### **PEO's**

Graduates should be able to utilize the knowledge gained from their academic program to:

**PEO 1:** Solve problems in a modern technological society as valuable and productive engineers.

**PEO 2:** Function and communicate effectively, both individually and within multidisciplinary teams

**PEO 3:** Be sensitive to the consequences of their work, both ethically and professionally, for productive professional careers

**PEO 4:** Continue the process of life-long learning

## ABOUT THE COLLEGE

### VISION

*Striving for a symbiosis of technological excellence and human values*

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 a 3-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.

### MISSION

*To arm the young brains with competitive technology and nurture the holistic development of the individuals for a better tomorrow.*

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.

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.

### 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.*

**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 program** 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.

**SEMESTER EXAMS**

- Semester theory examinations will be conducted for 70 marks. A student should secure a minimum of 40% marks in each subject for a pass.
  - Semester laboratory examinations will be conducted for 50 marks. A student should secure a minimum of 50% marks for a pass.
- In addition, a student shall secure a minimum of 40% marks in a theory subject and 50% marks in lab from sessional exams and semester examinations put together for a pass.

**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-SEM and 40% aggregate sessional marks in II- SEM

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17**  
**B.E. III/IV FIRST SEMESTER**

*With effect from the A.Y 2016-17*

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR B.E. 3/4 FIRST SEMESTER**  
**DATA BASE MANAGEMENT SYSTEMS**

S. No	Syllabus Ref. No.	SUBJECT	Scheme of Instruction				Scheme of Examination			Credits
			Periods per Week				Duration in Hrs	Maximum Marks		
			L	T	D	P		SEM Exam	Sessi onals	
<b>THEORY</b>										
1	CS 3010	Database Management Systems	4	-	-	-	3	70	30	3
2	CS 3020	Operating systems	4	-	-	-	3	70	30	3
3	CS 3030	Software Engineering	4	-	-	-	3	70	30	3
4	HS 3120	Managerial Economics and Accountancy	4	-	-	-	3	70	30	3
5	CS 3040	Automata, Languages and Computation	4	-	-	-	3	70	30	3
6	HS 3110	Finishing School-III: Soft Skills	2	-	-	-	1.5	35	15	1
7	CS 3050	Finishing School-III: Technical Skills	2	-	-	-	1.5	35	15	1
8	HS 3140	Human Values & Professional Ethics - II	2	-	-	-	1.5	35	15	1
<b>PRACTICALS</b>										
1	CS 3061	Database Management Systems Lab	-	-	-	3	3	50	25	2
2	CS 3071	Operating systems Lab	-	-	-	3	3	50	25	2
3	CS 3081	Software Engineering Lab	-	-	-	3	3	50	25	2
4	CS 3095	Mini Project	-	-	-	3	3	-	25	1
TOTAL			<b>26</b>			<b>12</b>	-	<b>605</b>	<b>295</b>	<b>25</b>
GRAND TOTAL						<b>38</b>		<b>900</b>	<b>295</b>	<b>25</b>

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Instruction : 4 Periods/ week	Sem Exam Marks:70	Subject Reference Code: <b>CS 3010</b>
Credits :3	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>design a database system and understand the issues involved in implementing the database.</li> </ul>	<ul style="list-style-type: none"> <li>create conceptual data model using Entity Relationship Diagram</li> <li>design conceptual and logical database models for an application.</li> <li>normalize relational database design of an application.</li> <li>explain the need for Indexing and Hashing and illustrate transactional processing.</li> <li>describe strategies for providing security, privacy, control, backup and recovery of data.</li> </ul>

**UNIT-I**

**Introduction:** Database System Application, Purpose of Database Systems, View of Data, Database Languages, Relational Database, Database Design, Specialty Databases, Data Storage and Querying, Data Mining and Information retrieval, Database Architecture , Database Users and Administrators.

**Database Design and E-R Model:** Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams, E-R Design Issues, Extended E-R features, Reduction to Relational Schemas, Other aspects of Database Design.

**UNIT-II**

**Relational Model:** Structure of Relation Database, Fundamental Relational Algebra Operations, Additional Relational Algebra Operations, Extended Relational Algebra Operations, Modification of the Database.

**Structured Query Language:** Introduction, Basic Structure of SQL Queries, Set Operations, Additional Basic Operations, Aggregate Functions, Null Values, Nested Sub queries, Views, Join Expression.

### UNIT-III

**Advanced SQL:** SQL Data Types, Integrity constraints Authorization, Functions and Procedural Constructs, Recursive Queries, Triggers, JDBC, ODBC and Embedded SQL.

**Relational Database Design:** Features of Good Relational Designs, Atomic Domains and first Normal form, Decomposition Using Functional Dependencies, functional Dependency Theory, Algorithm for Decomposition, Decomposition using Multivalued Dependencies.

### UNIT-IV

**Indexing and Hashing :** Basic Concepts, Ordered Indices, B+ Tree Index Files, B-Tree Files, Multiples – Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

**Transaction Management:** Transaction concept, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation and Atomicity, Serializability, Recoverability, Transaction Isolation Levels, Implementation of Isolation Levels.

### UNIT-V

**Concurrency Control:** Lock Based Protocols, Timestamp – Based Protocols Validation Based Protocols, Multiples Granularity, Multiversion Schemes, Deadlock Handling, Insert and Delete Operations, Weak Levels of Consistency, Concurrency in Index Structures.

**Recovery System :** Failure Classification, Storage Structure Recovery and Atomicity, Log Based Recovery, Recovery with Concurrent Transactions, buffer Management, Failure with Loss of Non-volatile Storage, Advanced Recovery Techniques, Remote Backup Systems.

#### Learning Resources

1. Abraham Silberschatz, Henry F Korth, S Sudharshan, *Database System Concepts*, 6<sup>th</sup> Edition, McGraw-Hill International Edition, 2011
2. Date CJ, Kannan A, Swamynathan S, *An Introduction to Database System*, 8<sup>th</sup> Edition, Pearson Education-2006.
3. Raghu Ramakrishna, Johannes Gehrke, *Database Management Systems*, 3<sup>rd</sup> Edition, McGraw Hill, 2003.
4. RamezElmasri, Durvasul VLN Somyazulu, Shamkant B Navathe, Shyam K Gupta, *Fundamentals of Database Systems*, 4<sup>th</sup> Edition, Pearson Education, 2006.
5. Peter rob, Carlos coronel, *Database Systems*, Thomson , 2007.

With effect from the A.Y 2016-17

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING SYLLABUS FOR B.E. 3/4 FIRST SEMESTER OPERATING SYSTEMS

Instruction : 4 Periods/ week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3020</b>
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"><li>• analyze different methods to perform Operating Systems services</li></ul>	<ul style="list-style-type: none"><li>• compare various CPU scheduling algorithms in process management</li><li>• illustrate different main memory and File allocation techniques</li><li>• design process synchronization solutions for classical synchronization problems and describe various deadlock handling methods</li><li>• describe various Disk scheduling algorithms and I/O operation implementation</li><li>• explain the features of Linux and Windows10 Operating systems</li></ul>

### UNIT-I

**Introduction to operating systems:** Definition, Mainframe, Multiprocessor, Clustered and Real time systems, Distributed, OS System structure, Unikernel, OS Services, Virtual machines, Containers, System calls.

**Process:** Process concept, Process Scheduling, Inter-process communication, Threads, Multithreading Models.

**CPU Scheduling:** Scheduling Criteria, Scheduling Algorithms, Multiprocessor scheduling.

### UNIT-II

**Memory Management:** Swapping, Contiguous allocation, Paging, Segmentation, Segmentation with Paging.

**Virtual memory:** Demand paging, Page replacement Algorithms, Thrashing.

**File System Interface:** File Concept, Access Methods, Directory Structure, File System Mounting.

**File System Implementation:** File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free Space management.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR B.E. 3/4 FIRST SEMESTER**  
**SOFTWARE ENGINEERING**

**UNIT -III**

**Process synchronization:** Critical Section problem, Two process solution, Multiple process Solutions, Synchronization Hardware, Semaphores, Classical problems of Synchronization, Monitors.

**Deadlocks:** Necessary conditions, Resource allocation graph, Methods for handling deadlocks: Prevention, Avoidance, Detection and Recovery.

**UNIT -IV**

**Device Management:** Disk Structure, Disk Scheduling, Disk Management, Swap Space Management, RAID structure, Disk Attachment, Stable storage Implementation.

**I/O System:** I/O hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O request to hardware operation, Streams.

**UNIT-V**

**Protection:** Goal, Domain of protection, Access matrix, Implementation of Access matrix, Revocation of Access rights, Capability based Systems, Language based protection,

**Case Studies:** Linux System: Design Principles, Kernel Modules, Process Management, Network Structure, And Security.

Windows 10 - Design Principles, Architecture, Environmental Subsystem.

**Learning Resources**

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, 9<sup>th</sup> Edition Wiley India, 2006.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2<sup>nd</sup> Edition, Pearson Education, Asia-2001.
3. Dhananjay M. Dhamdhere, *Operating System-concept based approach*, 3<sup>rd</sup> edition, Tata McGraw Hill, Asia-2009
4. Robert Love: *Linux Kernel Development*, Pearson Education, 2004
5. Richard Stevens, Stephen Rago, *Advanced Programming in the UNIX Environment*, 3<sup>rd</sup> Edition, Pearson Education, 2013

Instruction : 4 Periods/ week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3030</b>
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>• Understand the activities of software development life cycle and adapting the best practices to be employed for the development, operation and maintenance of the software project.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze, identify the requirements of the intended system and generate the requirement document.</li> <li>• Apply the software development lifecycle models for developing software projects.</li> <li>• Identify the appropriate building blocks of UML and design structural or behavioral model for the given system.</li> <li>• Design architectural models using UML for the given system.</li> <li>• Compare different test strategies and apply them to identify various errors in the software system</li> </ul>

**UNIT-I****Introduction to Software Engineering:**

**A generic view of Process:** Software Engineering, Process Framework, CMM Process Patterns, Process Assessment, Personal and Team Process Models, Process Technology, Product and Process.

**Process Models:** Prescriptive models, Waterfall Model, Incremental Process Model, 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, Lean Methodology.

**UNIT-II**

**Planning and Managing the Project:** Tracking progress, Project Personnel, Effort Estimation, Risk Management, The Project Plan, Process Models and project Management.

**Requirements Engineering:** A bridge to Design and Construction, Requirements Engineering Tasks, Initiating Requirements Engineering Process, Eliciting Requirements, Negotiating Requirements, Validating Requirements.

**Design concepts and principles** –Principles, Abstraction, Refinement, Modularity, Cohesion and Coupling.

### UNIT-III

**Object oriented Modeling & Design using UML:** Introduction to UML.

**Structural Modeling:** Classes and Advanced Classes, Relationships and Advanced Relationships, Common Mechanisms, Class Diagrams, Interfaces, Types and Roles, Packages.

### UNIT-IV

**Behavioral Modeling:** Interactions, Interaction diagrams, Use Cases, Use Case Diagrams, Activity diagrams, Events and Signals, Processes and Threads, State Machines, State chart Diagrams.

**Architectural Modeling:** Artifacts, Development, Collaborations, Artifact diagrams, Deployment diagrams.

### UNIT-V

**Testing Strategies:** A Strategic approach to software testing, Strategic issues, Test strategies for O-O Software, Validation testing, System testing, the art of debugging.

**Testing Tactics:** Software testing fundamentals, Black box and White box testing, Basis path testing, Control Structure, O-O testing methods, Class level testing methods, Inter class test case design, Testing for specialized environments, architectures and Applications testing patterns.

**Product Metrics:** Software quality, A frame work for Product metrics, Metric for the analysis model, Metrics for the Design Model, Metrics for Source code, Metrics for testing, Metrics for maintenance.

#### Learning Resources:

1. Roger S. Pressman, *Software Engineering A Practitioner's Approach*, 6<sup>th</sup> Edition, Tata McGrawHill, International Edition, 2005.
2. Shari Lawrence Pfleeger, *Software engineering Theory and Practices*, 4<sup>th</sup> Edition - Pearson Education, India, 2011.
3. Pankaj Jalote, *An Integrated Approach to Software Engineering*, 3<sup>rd</sup> Edition, Narosa Publishing House, 2005.
4. Grady Booch, James Rumbaugh, Ivor Jacobson, *The Unified Modeling Language-User guide*, (Covering UML 2.0), 2<sup>nd</sup> Edition Pearson Education, India 2007.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR III/IV B.E -I SEMESTER**  
**MANAGERIAL ECONOMICS AND ACCOUNTANCY**

Instruction: 4Periods/ week	Sessionals:30 Marks	SEM Exam Marks:70 Marks
Credits:03	SEM Exam Duration:3 Hrs	Subject Ref Code: HS 3120

Course Objective:	Course Outcomes
<ul style="list-style-type: none"> <li>• To create an awareness about the significance of economics in day to day life and its impact of policies of organizations.</li> <li>• Helps in engineering the products according to the societal needs</li> <li>• Helps in leaning the investment decision making</li> <li>• To understand the economical ways of production and pricing the products based on the market structures</li> <li>• To analyse the performance of companies</li> </ul>	<p><b>At the end of the course students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Make decisions in solving the economic problems of the organization</li> <li>• Make better sale of the product with customer centered products and services</li> <li>• Make economical production by identifying the optimum combination of inputs and price them appropriately for better profits</li> <li>• Understand the process of making long term investment decisions involving huge outlay</li> <li>• Analyse the past performance of the company and make decisions for future and will be competent to set up own enterprise.</li> </ul>

### 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).

#### Suggested Reading:

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
6. Micro Economics by M. L. Seth.
7. Financial Accounting by Jain & Narang.
8. Panday I.M. "Financial Management" Vikas Publishing House, 2009.

With effect from the A.Y 2016-17

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING SYLLABUS FOR B.E. 3/4 FIRST SEMESTER AUTOMATA, LANGUAGES AND COMPUTATION

Instruction : 4 Periods/week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3040</b>
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to	Students will be able to
<ul style="list-style-type: none"><li>• Design abstract models for formal languages and determine the decidability of computational problems.</li></ul>	<ul style="list-style-type: none"><li>• design Finite Automata.</li><li>• describe the properties of Regular Languages, apply pumping lemma to determine language is Regular or not.</li><li>• model Pushdown Automata and explain properties of Context Free Languages.</li><li>• design Turing machines.</li><li>• determine the undecidability of a problem.</li></ul>

### UNIT-I

**Automata:** Introduction to Finite Automata, The Central Concepts of Automata Theory.

**Finite Automata:** An Informal Picture of Finite Automata, Deterministic Finite Automata, Nondeterministic Finite Automata, An application, Finite Automata with Epsilon Transitions.

**Regular expressions and Languages:** Regular Expressions, Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions.

### UNIT – II

**Properties of Regular Languages:** Proving Languages not to be Regular, Closure properties of Regular Languages, Decision Properties of Regular Languages, Equivalence and Minimization of Automata.

**Context Free Grammars and Languages:** Context free grammars, Parse Trees, Applications of CFG's, Ambiguity in Grammars and Languages.



### UNIT – III

**Pushdown Automata:** Definition of Pushdown Automata, Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata.

**Properties of Context Free Languages:** Normal Forms for Context Free Grammars, Pumping Lemma for Context-Free Languages, Closure Properties of Context-Free Languages, Decision Properties of CFL's.

### UNIT – IV

**Introduction to Turing Machines:** Problems that Computers cannot Solve, The Turing machine, Programming Techniques for Turing Machines, Extensions to the Basic Turing Machine, Restricted Turing Machines, Turing machines and Computers.

### UNIT – V

**Undecidability:** A language that is not Recursively Enumerable, An undecidable problem that is RE, Undecidable problems about Turing Machines, Post's Correspondence Problem, Other Undecidable Problems.

**Intractable Problems:** The Classes P and NP, An NP-Complete Problem, A Restricted Satisfiability Problem.

#### Learning Resources:

1. John. E. Hopcroft, Rajeev Motwani, Jeffery D. Ullman, *Introduction to Automata Theory, Languages and Computation*, 3<sup>rd</sup> edition, Pearson Education, 2009
2. John C.Martin, *Introduction to Languages and the Theory of Computation*, 3<sup>rd</sup> edition Tata McGraw Hill, 2003.
3. Bernard M.Moret, *The Theory of Computation*, Pearson Education, 2002.
4. Michael Sipser, *Introduction to Theory of Computation*, 3rd Edition, Course Technology, 2012
5. ZviKohavi , *Swicthing and finite Automata Theory*,3<sup>rd</sup> Edition TMH, 1976.

With effect from the A.Y 2016-17

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING SYLLABUS FOR B.E. 3/4 FIRST SEMESTER

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.

### FINISHING SCHOOL-III: SOFT SKILLS

Course Objective:	Course Outcomes
<p>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</p> <ol style="list-style-type: none"><li>1. Numerical Ability</li><li>2. Arithmetic Ability</li><li>3. General reasoning</li></ol>	<p><b>At the end of the course students will be able to:</b></p> <ul style="list-style-type: none"><li>• Solve questions on the above mentioned areas using short cuts and smart methods</li><li>• Understand the fundamentals concepts of Aptitude skills</li><li>• Perform calculations with speed and accuracy</li></ul>

#### 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 COMPUTER SCIENCE & ENGINEERING SYLLABUS FOR B.E. 3/4 FIRST SEMESTER FINISHING SCHOOL-III: TECHNICAL SKILLS

Instruction : 2 Periods/ week	Sem. Exam Marks: 35	Subject Ref. Code: <b>CS 3050</b>
Credits :1	Sessional Marks: 15	Duration of Sem. Exam : 1.5 Hrs.

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>• identify and use appropriate data structure for a given application with effective utilization of space and time.</li> <li>• design and analyze Algorithms for a given application by using various design strategies</li> <li>• define the fundamentals of programming and write program to solve specified problems using Java</li> </ul>	<ul style="list-style-type: none"> <li>• apply structured and object oriented programming concepts in designing a solution to a problem</li> <li>• choose appropriate linear and non-linear data structures and implement various operations on them for a given application</li> <li>• analyze complexity of various problems using algorithm design strategies</li> <li>• describe the concept of NP-hard and NP-Complete problems</li> <li>• differentiate between structured, object oriented programming and apply various object oriented features to solve computing problems.</li> </ul>

#### UNIT-I

**C:** Functions, Arrays, Pointers, Strings, Structure, Files, Dynamic memory allocation

**C++:** OOPS Concepts, Constructors, Destructors, Polymorphism, Inheritance, Templates, Exception handling, Dynamic memory allocation

#### UNIT-II

**Data Structures:** Arrays, Linked list, Stack, Queues, Trees (BST, AVL), Graph traversals (BFS, DFS), Sorting techniques

#### UNIT-III

**Design & Analysis of Algorithms:** Analysis of algorithms, Algorithm Design strategies – Divide & Conquer, Greedy, Dynamic Programming, Backtracking.

#### UNIT-IV

**Design & Analysis of Algorithms:** Branch & Bound, String & Pattern matching algorithms, NP-Hard & NP-Complete class of problems.

#### UNIT-V

**Java:** Java vs C++, JVM Architecture, Inheritance, Polymorphism, Exceptions, Multithreading Applications, Use cases on Collections framework, Serialization, Observable

#### Learning Resources:

1. B.A.Forouzan, Richard F.Gilberg, *A Structured Programming Approach using C*, 3<sup>rd</sup> Edition, Cengage Learning, 2013.
2. SartajSahani, *Data Structures Algorithms and Applications in C++*, 2<sup>nd</sup> Edition, Universities Press (India) private limited, 2005.
3. Mark Allen Weiss, *Data Structures and problem solving using C++*, 2<sup>nd</sup> Edition, Addison-Wesley, 2000.
4. Horowitz E. Sahani S: *Fundamentals of computer Algorithms*, Galgotia publications.
5. Herbert Schildt, *The Complete Reference Java*, 7<sup>th</sup> Edition, Tata McGraw Hill 2005.

**DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES  
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 Sem Exam : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>• Get a holistic perspective of value- based education.</li> <li>• Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations.</li> <li>• Understand professionalism in harmony with self and society.</li> <li>• Develop ethical human conduct and professional competence.</li> <li>• Enrich their interactions with the world around, both professional and personal.</li> </ul>	<ul style="list-style-type: none"> <li>• Gain a world view of the self, the society and the profession.</li> <li>• Make informed decisions.</li> <li>• Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals</li> <li>• Inculcate Human values into their profession.</li> </ul>

**UNIT-I**

**A. DISTINCTION BETWEEN NEED AND GREED**

Exercising the wisdom to distinguish need from greed.

**B. 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.

**UNIT-II**

**A. RIGHTS AND RESPONSIBILITIES**

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

**B. 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.

**UNIT-III: 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.

<ul style="list-style-type: none"> <li>• Anger/ Depression</li> <li>• Fear</li> <li>• Agitation</li> <li>• Failure</li> <li>• Lethargy</li> <li>• Dishonesty</li> </ul>	<ul style="list-style-type: none"> <li>• Cruelty</li> <li>• Jealousy</li> <li>• Desire</li> <li>• Cheating</li> <li>• Pride</li> <li>• Greed</li> <li>• Lying</li> </ul>
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**UNIT-IV : 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.

**UNIT-V: DEVELOPING EMOTIONAL INTELLIGENCE**

- Self-Awareness
- Handling Emotions
- Motivation
- Empathy
- Social skills

**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, New Jersey,2004 (Indian Reprint)

**Online Resources**

1. Value Education website, Http://www.universalhumanvalues.info
2. UPTU webiste, Http://www.uptu.ac.in
3. story of stuff, Http://www.storyofstuff.com
4. AlGore, As Inconvenient Truth, Paramount Classics, USA
5. Charlie Chaplin, Modern Times, United Artists, USA
6. IIT Delhi, Modern Technology-The Untold story
7. Anand Gandhi, Right Here Right Now, Cyclewala production

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 FIRST SEMESTER  
DATA BASE MANAGEMENT SYSTEMS LAB**

Instruction : 3 Periods/week	Sem. Exam Marks: 50	Subject Ref. Code: <b>CS 3061</b>
Credits :2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>apply query languages, stored functions to store, update, modify and delete records from a database and to create forms and generate reports from it.</li> </ul>	<ul style="list-style-type: none"> <li>create and place constraints on databases</li> <li>practice queries to retrieve data on relational databases</li> <li>summarize data by means of group by operation and arranging the records using order by operation</li> <li>write PL/SQL Programs &amp; design Forms</li> <li>write PL/SQL Programs &amp; generate reports for databases</li> </ul>

**LIST OF EXPERIMENTS:**

**1. SQL**

- 1 Creation of database (Exercising the commands like DDL, DML, DCL and TCL)
- 2 Exercising all types of Joins
- 3 Creating tables in I Normal, II Normal, III Normal and BCNF Form.
- 4 Creating tables using combination of constraints.
- 5 Exercising Simple to complex Queries
- 6 Usage of Stored Functions
- 7 Creating Password and Security features for an Application
- 8 Usage of file locking, Table locking facilities in Applications.

**2. PL/SQL**

- a) Demonstration of Blocks, Cursors, Procedures, functions and Packages.
- b) Demonstrate Exception Handling
- c) Usage of Triggers to perform operation on Single and Multiple Tables.
- d) PL/SQL Procedures for data validation

**3. FORMS**

Creation of forms for colleges Information System, Library Information System and Recruitment Cell

**4. REPORTS**

- a. Creation of Reports based on different queries
- b. Creation of small full-fledged Database Application spread over 3 sessions.

**Note: The creation of sample database for the purpose of the experiments is expected to pre-decided by the instructor.**

**Learning Resources:**

1. Ivan Bayross, SQL, PL/SQL, The Programming Language of Oracle, 4<sup>th</sup> Edition, PBP Publications.
2. NileshShah, *Database Systems Using Oracle*, 2<sup>nd</sup> Edition, PHI, 2007
3. Rick F Van der Lans, *Introduction to SQL*, 4<sup>th</sup> Edition, Pearson Education, 2007.
4. Benjamin Rosenzweig Elena Silvestrova, *Oracle PL/SQL by Example*, 3<sup>rd</sup> Edition, Person Education, 2004.
5. Albert Lulushi, *Oracle Forms Developer's Handbook*, 1<sup>st</sup> Edition, Pearson Education, 2006.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 FIRST SEMESTER  
OPERATING SYSTEMS LAB**

Instruction : 3 Periods/ week	Sem. Exam Marks: 50	Subject Ref. Code: <b>CS 3071</b>
Credits :2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>implement different services of operating system</li> </ul>	<ul style="list-style-type: none"> <li>implement operations on Files and Process by using system calls</li> <li>develop CPU Scheduling mechanisms</li> <li>implement Contiguous memory allocation techniques and Page Replacement techniques</li> <li>design solutions for Inter-Process Communication</li> <li>implement various Deadlock handling techniques</li> </ul>

- Implement system calls for
  - File system management
  - Process management
- Implementation of CPU scheduling algorithms (FCSF, SJF, Priority, RR, Multi level)
- Implement contiguous Memory management techniques
  - Best Fit
  - Worst Fit
  - First Fit
- Implementation of Page Replacement algorithms a) FIFO b) LRU c) OPTIMAL
- Implement Inter-process communication using
  - Pipes
  - Message Queues
  - Shared Memory
- Implementation of Process Synchronization for Bounded buffer, Readers-Writers and Dining philosophers problems
- Implementation of Deadlock handling
  - Resource Allocation Graph
  - Safety Algorithm
  - Resource Request algorithm
  - Wait for graph

**Learning Resources:**

- Richard Stevens, Stephen Rago, *Advanced Programming in the UNIX Environment*, 3<sup>rd</sup> Edition, Pearson Education, 2013
- Abraham Silberschatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, Wiley India, 2006.
- Andrew S. Tanenbaum, *Modern Operating Systems*, 2<sup>nd</sup> Edition, Pearson Education, Asia-2001.
- Dhananjay M. Dhamdhare, *Operating System-concept based approach*, 3<sup>rd</sup> edition, Tata McGraw Hill, Asia-2009
- Robet Love, *Linux Kernel Development*, Pearson Education, 2004

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 FIRST SEMESTER  
SOFTWARE ENGINEERING LAB**

COURSE OBJECTIVE	COURSE OUTCOMES
Instruction : 3 Periods/week	Sem. Exam Marks: 50
Credits :2	Sessional Marks: 25
Subject Ref. Code: <b>CS 3081</b>	
Duration of Sem. Exam : 3 Hours	
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>Apply software engineering principles for analyzing, visualizing, specifying, constructing and documenting the artifacts of software intensive system</li> </ul>	<ul style="list-style-type: none"> <li>Identify the functional, performance requirements and estimate effort /cost for the given system</li> <li>Describe the Data/Work/Control flow in the modules of the intended system</li> <li>Construct the Structural, Behavioural aspects, Interaction &amp; state of the objects for the intended system</li> <li>Model the architectural and network aspects of the intended system</li> <li>Explain the artefacts of the intended system through forward and reverse engineering.</li> </ul>

**Select one large information system/Approach and device the following using CASE TOOL.**

- Systems Software Requirement Specification (SRS) and related analysis documents as per the guidelines in ANSI/IEEE Std 830-1984.
- Design documents representing the complete design of the software system using Data flow diagrams
- Functional Decomposition and Structure
- Behavioral Modeling - Use case Diagram demonstration using UML
- Behavioral Modeling - Interaction Diagrams demonstration using UML

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING COURSE STRUCTURE**  
**B.E. III YEAR – II SEMESTER**  
**SCHEME OF INSTRUCTION AND EXAMINATION W.E.F. (2016-17)**

6. Behavioral Modeling - State machine Diagram demonstration using UML
7. Structural Modeling - Class Diagram demonstration using UML
8. Familiarization of Forward and Reverse Engineering the class Diagram using tools available
9. Architectural Modeling – Component and Deployment Diagrams demonstration using UML
10. Simple exercises on effort, cost and resource estimation
11. Familiarization of SCM tools with some public domain software like SCCS, CVS
12. Test Data Generation, Verification

**Learning Resources:**

1. Roger S. Pressman, *Software Engineering: A Practitioner's Approach*, 6<sup>th</sup> Edition, Tata McGrawHill, International Edition, 2005.
2. Grady Booch, James Rumbagu, Ivor Jacobson, *The Unified Modeling Language-User guide*, 2<sup>nd</sup> Edition Pearson Education, India 2007.

*With effect from the A.Y 2016-17*

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**MINI PROJECT FOR B.E. 3/4 FIRST SEMESTER**

Instruction : 3 Periods/week	Subject Ref. Code: <b>CS 3095</b>
Credits :1	Sessional Marks: 25

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>Develop an application in the relevant area of Computer Science.</li> </ul>	<ul style="list-style-type: none"> <li>Review the literature and identify the problem</li> <li>Design a model to address the proposed problem</li> <li>Develop and test the solution</li> <li>Demonstrate the work done in the project through Presentation and Documentation</li> <li>Adapt to contemporary technologies</li> </ul>

The students are required to carry out mini projects in any areas such as Data Structures, Microprocessors & interfacing, Database Management Systems, Operating Systems, Design and Analysis of Algorithms and Software Engineering.

Students are required to submit a report on the mini project at the end of the semester.

S. No	Syllabus Ref. No.	SUBJECT	Scheme of Instruction				Scheme of Examination			Credits
			Periods per Week				Duration in Hrs	Maximum Marks		
			L	T	D	P		SEM Exam	Sessi onals	
<b>THEORY</b>										
1	CS 3110	Web Programming & Services	4	-	-	-	3	70	30	3
2	CS 3120	Computer Networks	4	-	-	-	3	70	30	3
3	CS 3130	Compiler Construction	4	-	-	-	3	70	30	3
4	CS 3140	Principles of Programming Languages	4	-	-	-	3	70	30	3
5	CS 3XXX	Elective-I	4	-	-	-	3	70	30	3
6	HS 3210	Finishing School-IV (Soft Skills)	2	-	-	-	1.5	35	15	1
7	CS 3150	Finishing School-IV (Technical Skills)	2	-	-	-	1.5	35	15	1
<b>PRACTICALS</b>										
1	CS 3161	Web Programming & Services Lab	-	-	-	3	3	50	25	2
2	CS 3171	Computer Networks Lab	-	-	-	3	3	50	25	2
3	CS 3181	Compiler Construction Lab	-	-	-	3	3	50	25	2
4	CS 3195	Mini Project	-	-	-	3	3	-	25	1
<b>Total</b>			<b>24</b>	<b>12</b>	<b>12</b>	<b>3</b>	<b>-</b>	<b>570</b>	<b>280</b>	<b>24</b>
<b>Grand Total</b>			<b>36</b>				<b>-</b>	<b>850</b>	<b>280</b>	<b>24</b>

**ELECTIVE-I**

CS 3200 Advanced Databases	CS 3220 Advanced Computer Architecture	CS 3240 Software Quality and Testing
CS 3210 Information Storage Management	CS 3230 Simulation & Modelling	CS 3190 Multimedia System

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 SECOND SEMESTER  
WEB PROGRAMMING AND SERVICES**

Instruction : 4 Periods/week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3110</b>
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>develop Web Applications using technologies like HTML, XML, JavaScript, Servlet, JSP, PHP&amp; ASP.Net and publish web services.</li> </ul>	<ul style="list-style-type: none"> <li>describe WWW and design static pages using HTML, CSS, Java Script</li> <li>develop applications to connect to a database and create XML documents</li> <li>explain various architectural styles and develop dynamic web pages using Servlets</li> <li>design and develop dynamic web pages using JSP &amp; PHP scripting languages</li> <li>create dynamic pages using ASP.Net&amp; publish web services</li> </ul>

**UNIT-I**

**Web Basics and Overview:** Evolution of the Internet and World Wide Web, Web Basics, Introduction to HTML5, HTML5 Validation Service, Forms, HTML5 Form input Types, Cascading Style Sheets (Part-1), JavaScript: Introduction to Scripting Functions, Arrays, Objects.

**UNIT-II**

**XML: XML** Basics, XML Document Structure, XML Namespaces, XSL Transformations.

**Working with JDBC 4.0:** JDBC Drivers, JDBC Processes with java.sql package: Types of Statements, Retrieving Meta information from Database and Result Set, JDBC Processes with javax.sql package: JDBC Data Sources, Connection Pooling, Working with Transactions.

**UNIT-III**

**Java EE Platform:** Enterprise Architecture Types, JavaEE7 Architecture, Microservice Architecture

**Working with Servlet 3.1:** Java Servlet API, Servlet Life Cycle, Servlet Implementation, Request and Response Scope. Handling Sessions: Approaches to Session Tracking, Session Tracking with Java Servlet API.

**UNIT-IV**

**JSP:** Introduction to JSP, Architecture, JSP Lifecycle, JSP Elements: Directives, Scripting Elements, Action Tags, JSP Expression Language. JSP Tag Extensions: Tag Extensions, Tag Extension API, Writing Tag Handlers.

**PHP:** Introduction, Conversion between Data Types, Arithmetic Operators, Manipulating Arrays, String Processing, Form Processing and Business Logic, Reading from Database, Using Cookies.

**UNIT-V**

Web Application Development with **ASP.NET in C#:** Basics, ASP.NET Application, ASP.NET Standard Web Controls, Validation Controls, Session Tracking.

**Web Services:** Web Services Technologies - SOAP, REST, JSON, Web Services Architecture, Publishing and Consuming SOAP-Based WCF Web Service, Publishing and Consuming REST-Based XML Web Service, Publishing and Consuming REST- Based JSON Web Service.

**Learning Resources:**

1. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, *Internet & World Wide Web How to Program*, 5<sup>th</sup> Edition, Pearson Education.
2. *Java Server Programming Java EE7 (J2EE 1.7): Black Book*, Dreamtech Press.
3. UttamK.Roy, *Web Technologies*, Oxford publishers.
4. Robert W. Sebesta, *Programming the World Wide Web*, Pearson Education, 7<sup>th</sup> Edition.
5. Joe Duffy, *Professional .NET Framework 2.0*, Wiley India, 2007.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 SECOND SEMESTER  
COMPUTER NETWORKS**

Instruction : 4 Periods/ week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3120</b>
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>apply networking concepts to work on networked systems using the existing protocols and evaluate the role of security for developing end user applications.</li> </ul>	<ul style="list-style-type: none"> <li>describe various routing approaches and services supported for communications across data networks.</li> <li>explain the purpose of network and transport layers in managing the transportation of data in end-to-end communication.</li> <li>develop communication systems using existing socket API.</li> <li>illustrate various application layer protocols used for providing network services to end user applications.</li> <li>describe the need for information security and the basic concepts of cryptography.</li> </ul>

**UNIT-I**

**Introduction:** Uses of Computer Networks, Network Hardware, Network Software, Reference Models (ISO – OSI, TCP/IP).

**Network Layer:** Network Layer Design Issues.

**Routing Algorithms:** The Optimality Principle, Shortest Path Algorithm, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Anycast Routing, Routing for Mobile Hosts, Routing in Ad Hoc Networks.

**Congestion Control Algorithms:** Approaches to Congestion Control, Traffic-Aware Routing, Admission Control, Traffic Throttling, Load Shedding.

**Quality Of Service:** Application Requirements, Traffic Shaping, Packet Scheduling, Admission Control, Integrated Services, Differentiated Services.

**UNIT-II**

**Internetworking:** How Networks Differ, How Networks Can Be Connected, Tunneling, Internetwork Routing, Packet Fragmentation.

**Network Layer in the Internet:** The IP Version 4 Protocol, IP Addresses, IP Version 6, Internet Control Protocols, Label Switching and MPLS, OSPF, BGP, Internet Multicasting, Mobile IP.

**Transport Layer:** The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: TCP, Introduction, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, Connection Release, TCP Sliding Window, TCP Timer Management, TCP Congestion Control, The Internet Transport Protocols: UDP, Introduction to UDP, Remote Procedure Call, Real-Time Transport Protocols, Performance issues.

**UNIT-III**

**Socket Interface:** Sockets, Socket Address, Elementary Sockets, Advance Sockets, Socket Options, Asynchronous I/O, I/O Multiplexing, Out-of Band Data and Internet Super Server.

**Remote Procedure Calls:** Introduction, Transparency Issues and Sun RPC.

**UNIT-IV**

**Application Layer: Domain Name System:** DNS Name Space, Domain Resource Records, Name Servers. **Electronic Mail:** Architecture and Services, User Agent, Message Formats, Message Transfer and Final Delivery.

**World Wide Web:** Architectural Overviews, Static Web Pages, Dynamic Web Pages and Web Applications, HTTP, Mobile Web.

**Streaming Audio and Video:** Digital Audio, Digital Video, Streaming Stored Media, Streaming Live Media, Real-Time Conferencing.

**UNIT-V**

**Network Security:** Cryptography, Symmetric-Key Algorithms: DES, AES, Cipher Modes. Public-Key Algorithms: RSA. Digital Signatures, Management of Public Keys, Communication Security: IP sec, Firewalls, Virtual Private Networks, Wireless Security. Authentication Protocols, E-Mail Security: PGP, Web Security: Threats, Secure Naming, SSL, Mobile Code Security.

**Learning Resources:**

1. Andrew S. Tanenbaum, David J. Wetherall, *Computer Networks*, 5<sup>th</sup> 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*, 5<sup>th</sup> Edition, Addison-Wesley, 2012
4. Chwan-Hwa (John) Wu, J. David Irwin, *Introduction to Computer Networks and Cyber Security*, CRC Press, 2013
5. W. Richard Stevens, Andrew M Rudoff, Bill Fenner, *Unix Network Programming: Networking APIs: Sockets and XTI*, Volume 1, 3<sup>rd</sup> Edition, PHI.



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR B.E. 3/4 SECOND SEMESTER**  
**COMPILER CONSTRUCTION**

Instruction : 4 Periods/week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3130</b>
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>• apply the concepts of a Compiler design to design a compiler for a generic machine</li> </ul>	<ul style="list-style-type: none"> <li>• compare different language Processors and design Lexical Analyzer for a given language</li> <li>• construct Parser using top down and bottom up parsing techniques</li> <li>• generate Intermediate code for a given set of instructions</li> <li>• choose appropriate data structure for symbol table organization and describe stack and heap memory management</li> <li>• generate a target code for given high level code and differentiate various code optimization techniques</li> </ul>

**UNIT-I**

**Introduction:** Language Processors, The structure of a Compiler, The Evolution of Programming Languages, Boot strapping and Porting.

**Lexical analysis:** The role of the Lexical Analyzer, Input Buffering, Specification of Tokens. Recognition of Tokens, Error Recovery, The Lexical-Analyzer Generator LEX.

**UNIT-II**

**Syntax Analysis :** Introduction, Top-Down parsing-Recursive Descent, Predicative, Bottom-Up parsing- Introduction to LR Parsing, More Powerful LR parsers, Error recovery in top down and bottom up parsers, Parser Generators.

**UNIT-III**

**Syntax Directed Translation:** Syntax Directed Definitions, Evaluation Orders for SDDs, Applications of Syntax Directed Translation.

**Intermediate code generation:** Variants of Syntax Trees, Three-Address Code, Types and Declarations, Translation of Expressions, Type Checking, Control Flow.

**UNIT-IV**

**Storage Organization:** Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management, Introduction to Garbage Collection

**Symbol Table Organization:** Structure of Symbol Table, Symbol Table organization for Block Structured and Nonblock Structure languages, Data Structures of symbol Table.

**UNIT-V**

**Code Generation:** Issues in the Design of a Code Generator, The Target Language, Addresses in the Target Code Basic Blocks and Flow Graphs.

**Code Optimization:** Optimization of Basic Blocks. Peephole Optimization, Register Allocation and Assignment, Machine Independent Optimizations – The Principal Sources of Optimizations, Introduction to Data Flow analysis,.

**Learning Resources:**

1. Alfred V Aho, Monica S Lam, Ravi Sethi, Jeffrey D Ullman – *Compilers: Principles, Techniques & Tools*, 2<sup>nd</sup> Edition, Pearson Education 2007.
2. Keith d Cooper & Linda Tarezon, *Engineering a Compiler*, Morgan Kafman, 2<sup>nd</sup> Edition
3. John R Levine, Tony Mason, Doug Brown *Lex & Yacc*, 3<sup>rd</sup> Edition Shroff Publisher, 2007
4. Kenneth C Loudon , *Compiler Construction: Principles and Practice*, 2<sup>nd</sup> Edition, Cengage Learning, 2005
5. John R Levine ,*Lex & Yacc*, Oreilly Publishers, 2<sup>nd</sup> Edition, 2009.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 SECOND SEMESTER  
PRINCIPLES OF PROGRAMMING LANGUAGES**

Instruction : 4 Periods/ week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3140</b>
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>have an understanding of principles and implementation of high level languages.</li> </ul>	<ul style="list-style-type: none"> <li>compare different programming paradigms.</li> <li>differentiate different binding techniques by using constructs of various Programming languages</li> <li>explain conditional statements, control loops and subprograms in various programming languages.</li> <li>illustrate object oriented programming concepts, exception handling and process concurrency control by semaphore, monitor and message passing in various programming languages.</li> <li>describe functional, logic and scripting programming language features.</li> </ul>

**UNIT-I**

**Preliminary Concepts:** Reasons for Studying Concepts of Programming Languages, Programming Domains, Language Evaluation Criteria, Influences on Language design, Language categories, Language Design Trade-offs, Implementation Methods, Programming Environments, Evolution of the Major Programming Languages.

**Describing Syntax and Semantics:** General Problem of Describing Syntax, Formal Methods of Describing Syntax, Attribute Grammars, Describing the Meaning of Programs.

**UNIT-II**

**Names, Bindings, Type Checking and Scopes:** Names, Variables, The Concept of Binding, Type Checking, Strong Typing, Type Compatibility, Scope, Scope and Lifetime Referencing Environments, Named Constants.

**Data Types:** Primitive Data Types, Character String Types, User- Defined Ordinal Types, Array Types, Associative Arrays, Record Types, Union Types, Pointer and Reference Types.

**Expressions and Assignment Statements:** Arithmetic Expressions, Overloaded Operators, Type Conversions, Relational and Boolean Expressions, Short-Circuit Evaluation, Assignment Statements, Mixed- Mode Assignment.

**UNIT-III**

**Statement-Level Control Structures:** Selection Statements, Iterative Statement, Unconditional Branching, Guarded Commands.

**Subprograms:** Fundamentals and Design Issues for Subprograms, Local Referencing Environments, Parameter -Passing Methods, Parameters that are Subprogram Names,

Overloaded Subprograms, Generic Subprograms, Design Issues for Functions, User-Defined Overloaded Operators.

**Implementing Subprograms:** The General Semantics of Call and Returns, Implementing "Simple" Subprograms, Implementing Subprograms with Stack-Dynamic Local Variables, Nested Subprograms, Blocks, Implementing Dynamic Scoping.

**Abstract Data Types:** The Concept of Abstraction, Introduction to Data Abstraction, Design Issues for Abstract Data Types, Language Examples, Parameterized ADT, Encapsulation Constructs, Naming Encapsulation.

**UNIT-IV**

**Object Oriented Programming:** Design Issues, Object Oriented Programming in Smalltalk, C++, Java, C#, Ada 95, Ruby, The Object Model of JavaScript, Implementation of Object Oriented Constructs.

**Concurrency:** Subprogram Level Concurrency, Semaphores, Monitors, Message Passing, Ada Support for Concurrency, Java Threads, C# Threads, Statement-Level Concurrency.

**Exceptional Handling and Event Handling:** Introduction to Exception Handling, Exception Handling in Ada, C++ and Java, Introduction to Event Handling, Event Handling with Java.

**UNIT-V**

**Functional Programming Languages:** Introduction, Mathematical Functions, Fundamentals of FPL, LISP, Introduction to Scheme, COMMON LISP, ML, Haskell, Application of Functional Programming Languages, A Comparison of Functional and Imperative Languages.

**Logic Programming Languages:** Introduction to Predicate Calculus, Predicate Calculus and Proving Theorems, An Overview of Logic Programming, The Origins, Basic Elements and Deficiencies of Prolog, Applications of Logic Programming.

**Scripting Languages:** Key Concepts, **Case Study:** Python- Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural abstraction, Data abstraction, Separate compilation, Module library.

**Learning Resources:**

1. Robert.W.Sebesta, *Concepts of Programming Languages*, 8<sup>th</sup> Edition, Pearson Education 2008.
2. Watt, Wiley Dreamtech, *Programming Languages*, 2<sup>nd</sup> Edition, 2004.
3. Louden, *Programming Languages*, 2<sup>nd</sup> Edition, Cengage, 2003.
4. Ghezzi, *Programming Languages*, 3<sup>rd</sup> Edition, John Wiley, 1998.
5. Pratt and Zelkowitz , *Programming Languages: Design and Implementation*, 4<sup>th</sup> Edition, PHI/Pearson Education, 2001

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 SECOND SEMESTER  
INFORMATION STORAGE MANAGEMENT (ELECTIVE-I)**

Instruction : 4 Periods/ week	Sem. Exam Marks: 70	Subject Ref. Code: CS 3200
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs

Course Objective	Course Outcomes
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>apply knowledge of advanced database management techniques to provide solution for a database intensive problem.</li> </ul>	<ul style="list-style-type: none"> <li>create and query tables in object relational and object oriented databases</li> <li>create, query and process data in XML files</li> <li>describe query processing mechanisms and query optimization.</li> <li>explain inter query, intra query parallelism and distributed database processing techniques.</li> <li>apply performance tuning methods and describe data representation in spatial, geographical &amp; temporal databases.</li> </ul>

**UNIT-I**

Object Based Databases: Overview, Complex data types, Structured types and inheritance in SQL, Table inheritance, Array and Multiset Types in SQL, Object –identity and reference Types in SQL, Implementing O-R features, Persistent programming languages, Object-relational mapping, Object-oriented versus object-relational.

**UNIT-II**

XML: Motivation, Structure of XML data, XML document scheme, Querying and transformation, Application program interface to XML, Storage of XML data, XML applications.

**UNIT-III**

Query Processing: Overview, Measures of query cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions.

Query Optimization: Overview, Transformation of relational expressions, Estimating statistics of expression results, Choice of evaluation plans, Materialized Views.

**UNIT-IV**

Parallel Databases: Introduction, I/O parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism, Query Optimization, Design of Parallel Systems.

Distributed Databases: Homogeneous and heterogeneous database, Distributed data Storage, Distributed transactions, Commit protocols, Concurrency control in distributed databases, Availability, Distributed query processing, Heterogeneous distributed databases.

**UNIT-V**

Advanced Application Development: Performance tuning, Performance benchmarks, Other issues in application development, Standardization.

Spatial and Temporal Data and Mobility: Motivation, Time in databases, Spatial and geographic data, Multimedia databases, Mobility and Personal databases.

**Learning Resources**

1. Abraham Silberschatz, Henry F Korth, S Sudarshan, *Database System Concepts*, McGraw Hill International Edition, 6<sup>th</sup> Edition, 2009.
2. Elmasri Navathe, Somayajulu, Gupta, *Fundamentals of Databases Systems*, Pearson Education, 4<sup>th</sup> Edition, 2006.
3. CJ Date, A Kannan, S Swamynathan, *An Introduction to Database Systems*, Pearson Education, 8<sup>th</sup> Edition, 2006.
4. Ramakrishna, Gehrke, *Databases Management Systems*, McGraw-Hill International Edition, 3<sup>rd</sup> Edition, 2003.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 SECOND SEMESTER  
INFORMATION STORAGE MANAGEMENT (ELECTIVE-II)**

Instruction : 4 Periods/ week	Sem. Exam Marks: 70	Subject Ref. Code: <b>CS 3210</b>
Credits :3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs

Course Objectives	Course Outcomes
Students should be able to	students will be able to
<ul style="list-style-type: none"> <li>apply the knowledge of different Storage techniques to practice scalable data universe generated by heterogeneous devices and devising a support system for a highly available self-sustainable business solution that are robust and secure.</li> </ul>	<ul style="list-style-type: none"> <li>explain the need for storage management and differentiate between the types of storage architectures and demonstrate the key data center elements in a classic, virtualized environments</li> <li>describe the components of a storage device, evaluate the need for data protection using RAID and illustrate the role of an Intelligent Storage Systems.</li> <li>explain storage networking technologies such as FC-SAN, IP-SAN, NAS, and Object-based storage solutions</li> <li>illustrate business continuity solutions including, backup and recovery technologies, and local and remote replication solutions</li> <li>describe information security and storage security domains Identify parameters of managing and monitoring storage infrastructure and describe common storage management activities and solutions</li> </ul>

**UNIT-I: Introduction to Storage Technology:**

Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities

**UNIT-II: Storage Systems Architecture:**

Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, Concept of RAID and its components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system

**UNIT-III: Introduction to Networked Storage:**

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfill the need, Understand the appropriateness of the different networked storage options for different application environments

**UNIT-IV: Information Availability & Monitoring & Managing Datacenter:**

List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime. Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures, Architecture of backup/recovery and the different backup/ recovery topologies, replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities. Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center

**UNIT-V: Securing Storage and Storage Virtualization:**

Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes

**Case Study:**

- The technologies described in the course are reinforced with EMC examples of actual solutions.
- Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

**Learning Resources**

- EMC Corporation, *Information Storage and Management*, Wiley, ISBN number: 04702942134.
- Robert Spalding, *Storage Networks: The Complete Reference*, Tata McGraw Hill, Osborne, 2003.
- Marc Farley, *Building Storage Networks*, Tata McGraw Hill, Osborne. 2001.
- Meeta Gupta, *Storage Area Network Fundamentals*, Pearson Education Limited, 2002

With effect from the A.Y 2016-17

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR III/IV B.E -SECOND SEMESTER**  
**FINISHING SCHOOL – IV :SOFT SKILLS**

Instruction: 2 Periods per week	Sessionals:15Marks	SEM Exam Marks:35 Marks
Credits:01	SEM Exam Duration:1.5 Hrs	Subject Ref Code: HS3210

<b>Course Objective:</b>	<b>Course Outcomes</b>
<p>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 &amp; logical reasoning skills. Students will be trained to work systematically and develop logical and analytical thinking. Students will be trained in the following areas</p> <ol style="list-style-type: none"><li>1. Critical and Non verbal reasoning</li><li>2. Pure Maths</li><li>3. Verbal ability</li><li>4. Logical reasoning</li><li>5. Data Interpretation and Analysis</li></ol>	<p><b>At the end of the course students will be able to:</b></p> <ul style="list-style-type: none"><li>• Understand the fundamentals concepts of Aptitude and verbal skills</li><li>• Solve questions using short cuts and smart methods</li><li>• Perform calculations with speed and accuracy</li><li>• Develop Analytical thinking and problem solving skills</li></ul>

**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 COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR B.E. 3/4 SECOND SEMESTER**  
**FINISHING SCHOOL-IV: TECHNICAL SKILLS-PEGA TOOL**

Instruction : 2 Periods/week	Sem. Exam Marks: 35	Subject Ref. Code: <b>CS 3150</b>
Credits :1	Sessional Marks: 15	Duration of Sem. Exam : 1.5Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>design and develop an application using the out of the box rules available in Pega 7 platform.</li> </ul>	<ul style="list-style-type: none"> <li>demonstrate Pega platform including Designer Studio and DCO tools</li> <li>analyse business needs and to organize them into stages and steps in a Pega application</li> <li>create layouts and access data in UI</li> <li>apply declarative processing to automate business policies</li> <li>apply best practices and guardrails in application design</li> </ul>

**System Architect Essential – I:**

BPM and Case Management Overview

Start Building an Application

Defining the Process

Pega Overview

Application Planning

DCO Essentials 7.1 course

Getting from Vision to Reality

Conducting a DCO Session

Defining the Data Elements

Enhancing the User Interface

Accessing Data in the Application

Automating Business Policies

Advanced Case Processing

Documenting the Application

**System Architect Essential – II**

Orientation

Effective Application Development with PRPC

Designing Enterprise Applications Using Case Management

Creating an Effective Data Model

Integrating with External Data Sources

Creating Engaging User Experiences

Enforcing Business Policies

Process Visibility Through Business Reporting

Best Practices for Preparing an Application for Testing Deployment

**Case Study**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR B.E. 3/4 SECOND SEMESTER**  
**WEB PROGRAMMING AND SERVICES LAB**

Instruction : 3 Periods/week	Sem. Exam Marks: 50	Subject Ref. Code: <b>CS 3161</b>
Credits :2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hours

<b>COURSE OBJECTIVE</b>	<b>COURSE OUTCOMES</b>
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>develop web applications and web services.</li> </ul>	<ul style="list-style-type: none"> <li>create website using HTML, CSS, XML &amp; JavaScript</li> <li>develop dynamic web applications using Servlets</li> <li>develop dynamic web applications using JSP's, PHP with DB connectivity</li> <li>develop dynamic web applications using ASP.Net with DB connectivity</li> <li>create and publish Web Services</li> </ul>

**LIST OF EXPERIMENTS**

1. Creation of Static Web Site using HTML
2. Creation of Static Web Site using HTML Forms
3. Apply CSS to the Static Web Site
4. Validation of Static Web Site using Java Script
5. Demonstration of XML, XSLT
6. Providing data store support using JDBC
7. Creation of dynamic content in a Web Site using Servlets in Spring framework
8. Demonstration of Servlet Collaboration in Web Applications using Spring framework
9. Demonstrate Session handling in Web Applications using Cookies in Spring framework
10. Demonstrate Session handling in Web Applications using Http Session
11. Creation of dynamic content in a Web Application using JSP in Spring framework
12. Creation of dynamic content in a Web Application using PHP.
13. Creation of dynamic content in a Web Application using ASP.NET
14. Publishing and Consuming a Web Service using SOAP
15. Publishing and Consuming a Web Service using REST
16. Demonstration of using AJAX in Web Application

**Learning Resources :**

1. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, *Internet & World Wide Web How to Program*, 5<sup>th</sup> Edition, Pearson Education.
2. *Java Server Programming Java EE7 (J2EE 1.7): Black Book*, Dreamtech Press.
3. <https://spring.io/docs>

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
SYLLABUS FOR B.E. 3/4 SECOND SEMESTER  
COMPUTER NETWORKS LAB**

Instruction : 3 Periods/week	Sem. Exam Marks: 50	Subject Ref. Code: <b>CS 3171</b>
Credits :2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs

<b>COURSE OBJECTIVE</b>	<b>COURSE OUTCOMES</b>
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>acquire proficiency in network programming using socket API, apply cryptographic algorithms and demonstrate Event Simulation using tools-ns2/ns3.</li> </ul>	<ul style="list-style-type: none"> <li>develop client server communications using socket API.</li> <li>simulate various networking protocols using Network simulator NS2/NS3.</li> <li>apply advanced socket system calls.</li> <li>apply Remote Procedure Call (RPC) on a networked environment.</li> <li>implement encryption and decryption by using Symmetric-key and Public key algorithms.</li> </ul>

**LIST OF EXPERIMENTS**

- Understanding and using the following commands: ifconfig, netstat, ping, arp, telnet, tftp, ftp, nslookup and dig.
- Study of Network Simulator NS2/NS3.
- Implementation of Iterative and Concurrent Echo Server using Connection Oriented Protocol (TCP).
- Implementation of Iterative and Concurrent Echo Server using Connection Less Protocol (UDP).
- Build a Concurrent Multithreaded File Transfer Server. Use separate threads to allow the server to handle multiple clients concurrently.
- Programs to demonstrate the usage of Advanced Socket System calls like getsockopt(), setsockopt(), select(),readv() writev(), getpeername(), getsockname().
- Implement a Concurrent Chat Server that allows currently logged in users to communicate with one another. Use socket system calls.
- Program to demonstrate Remote Procedure Call (RPC).
- Programs to Perform Encryption and Decryption using the following algorithms
  - Caeser cipher
  - Substitution cipher
  - Transposition cipher.

- Implementation of Establishing a Shared key: The Diffie-Hellman key exchange.
- Implement the Encryption and Decryption of 8-bit data using simplified Data Encryption Standard (DES) Algorithm in C.
- Implement RSA algorithm for Encryption and Decryption in C.

**Learning Resources:**

- W. Richard Stevens, Andrew M Rudoff, Bill Fenner, Unix Network Programming: Networking APIs: Sockets and XTI (Volume 1) 3<sup>rd</sup> Edition, PHI.
- W. Richard Stevens, Unix Network Programming, Prentice Hall/Pearson Education, 2009.
- Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, 5<sup>th</sup> Edition, Pearson, 2012.
- James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, 5<sup>th</sup> Edition, Addison-Wesley, 2012.
- Cryptography and Network Security: Principles and Practice, 7/E by William Stallings, Pearson education.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**SYLLABUS FOR B.E. 3/4 SECOND SEMESTER**  
**COMPILER CONSTRUCTION LAB**

Instruction : 3 Periods/week	Sem. Exam Marks: 50	Subject Ref. Code: <b>CS 3181</b>
Credits :2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to	Students will be able to
<ul style="list-style-type: none"> <li>implement phases of a compiler using YACC, LEX tools</li> </ul>	<ul style="list-style-type: none"> <li>implement lexical analysis</li> <li>implementation of finding first and follow set for a given grammar</li> <li>design top down and bottom parsers</li> <li>implement code generation</li> <li>implement code optimization</li> </ul>

**LIST OF PROGRAMMES**

1. Scanner programs using C
2. Scanner programs using LEX
3. Find first set and follow set
4. Implementation of Recursive decent parser
5. Implementation of LL(1) parser.
6. Implementation of SLR parser.
7. Implementation of CLR parser.
8. Implementation of LALR Parser using YACC
9. Construct dependency graph for the given SDD
10. Intermediate Code generation using YACC
11. Construct the DAG for given three address code
12. Implementation of Code optimization.
13. Compiling a Kernel for Raspberry, Arduino

**Learning Resources:**

1. Alfred V Aho, Monica S Lam, Ravi Sethi, Jeffrey D Ullman – *Compilers: Principles, Techniques & Tools*, 2<sup>nd</sup> Edition, Pearson Education 2007.
2. Keith d Cooper & Linda Tarezon, *Engineering a Compiler, Morgan Kafman*, 2<sup>nd</sup> Edition
3. John R Levine, Tony Mason, Doug Brown *Lex & Yacc*, 3<sup>rd</sup> Edition Shroff Publisher, 2007
4. Kenneth C Loudon , *Compiler Construction: Principles and Practice*, 2<sup>nd</sup> Edition, Cengage Learning, 2005
5. John R Levine , *Lex&Yacc*, Oreilly Publishers, 2<sup>nd</sup> Edition, 2009.

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**MINI PROJECT FOR B.E. 3/4 SECOND SEMESTER**

Instruction : 3 Periods/week	Subject Ref. Code: <b>CS 3195</b>
Credits :1	Sessional Marks: 25

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to:	Students will be able to:
<ul style="list-style-type: none"> <li>Develop an application in the relevant area of Computer Science.</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>Review the literature and identify a problem</li> <li>Design a model to address the proposed problem</li> <li>Develop and test the solution</li> <li>Demonstrate the work done in the project through Presentation and Documentation</li> <li>Adapt to contemporary technologies</li> </ul>

The students are required to carry out mini projects in any area of the areas such as Data Communications, Web Programming & Services, Computer Networks, Compiler Construction and Object Oriented System Development.

Students are required to submit a report on the mini project at the end of the semester.



## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### *ALMANAC FOR B.E - II & III year - I Semester [all branches]*

S.No.	Particulars	Date
1	Commencement of Instruction	11-07-2016
2	I Class Test	29-08-2016 to 01-09-2016
3	II Class Test	26-10-2016 to 29-10-2016
4	Last date of Instruction	29-10-2016
5	Preparation holidays & Practical Examinations	31-10-2016 to 12-11-2016
6	Commencement of Theory Examinations	14-11-2016

### *ALMANAC FOR B.E - II & III year - II Semester [all branches]*

S.No.	Particulars	Date
1	Commencement of Instruction	26-12-2016
2	I Class Test	13-02-2017 to 16-02-2017
3	II Class Test	11-04-2017 to 15-04-2017
4	Last date of instruction	15-04-2017
5	Preparation holidays & practical Examinations	17-04-2017 to 29-04-2017
6	Commencement of Theory Examinations	01-05-2017
7	Summer vacation	01-05-2017 to 08-07-2017
8	Commencement of I Semester for the Academic year 2017-2018	10-07-2017

<b>E - JOURNALS &amp; E-BOOKS SUBSCRIBED</b>	
ASCE	35
ASME	27
IEEE ASPP	155
ACM Digital Library	1138
Springer Mechanical	49
Total GIST E-Journals	1405
DELNET CONSORTIUM (IESTC E-Journals -2016)	1152
DELNET E-Journals	817
Total e-journals	3374
DELNET MEMBERSHIP E-Books	335
Journals and magazines Print version	106