Bachelor of Technology (Computer Science & Engineering)

Scheme of Studies/Examination

Semester VI

S. No.	Course No.	Subject	L:T:P	Hours / Week	Examination Schedule (Marks)				Duration of Exam (Hrs)
					Major Test	Minor Test	Practical	Total	
1	CSE 302N	Compiler Design	3:1:0	4	75	25	0	100	3
2	CSE 304N	Essential of Information Technology	3:1:0	4	75	25	0	100	3
3	CSE 306N	Mobile Computing	3:1:0	4	75	25	0	100	3
4	CSE 308N	Web Technology	3:1:0	4	75	25	0	100	3
5	CSE 310N	Software Engineering	3:1:0	4	75	25	0	100	3
6	HS 303N	Business Intelligence and Entrepreneurship	4:0:0	4	75	25	0	100	3
7	CSE 312N	Web Technology Lab	0:0:3	3	0	40	60	100	3
8	CSE 314N	Essential of Information Technology Lab	0:0:3	3	0	40	60	100	3
9	CSE 316N	Software Engineering Lab	0:0:3	3	0	40	60	100	3
		Total		**33**	**450**	**270**	**180**	**900**	

CSE-302N	Compiler Design					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**1**	**-**	**75**	**25**	**100**	**3 Hrs.**
Purpose	At the end of the course, the student will be able to design and implement a compiler.					
Course Outcomes (CO)						
CO1	To understand, design and implement a lexical analyzer.					
CO2	To understand, design and implement a parser.					
CO3	To understand, design code generation schemes.					
CO4	To understand optimization of codes and runtime environment					

UNIT I

Introduction to Compiling

Analysis of the source program, Phases of a compiler, Cousins of the Compiler, Grouping of Phases, Compiler construction tools.

Lexical Analysis –Regular Expression, Introduction to Finite Automata and Regular Expression, Conversion of Regular Expression to NFA, Role of Lexical Analyzer, Input Buffering, Specification of Tokens.

UNIT II

SyntaxAnalysis

Role of the Parser, Writing Grammars, Symbol Table, Context-Free Grammars, Top Down Parsing with or without Backtracking, Recursive Descent Parsing, Non-Recursive Descent Parsing, SLR Parser, Canonical LR Parser, LALR Parser.

UNIT III

Intermediate Code Generation and Code

Intermediate languages, Declarations, Assignment Statements, Boolean Expressions, Case Statements, DAG representation of Basic Blocks, A simple Code generator from DAG, Issues in the design of code generator , The target machine , Runtime Storage management, Error Handling- Type checking,

UNIT 1V

Code Optimization and Run Time Environments

Principal Sources of Optimization, Optimization of Basic Blocks, Peephole Optimization, Introduction to Global Data Flow Analysis, Source Language issues, Storage Organization, Static Storage Management, Heap Storage management, Access to non-Local Names, Parameter Passing.

TEXT BOOK

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.

REFERENCES

1. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
2. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.
3. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.
4. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001.
5. Kenneth C. Louden, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003

CSE-304N	Essentials of Information Technology					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**1**	**0**	**75**	**25**	**100**	**3 Hrs.**
Purpose	**To introduce the concepts of Object Oriented Programming using Java and RDBMS**					
Course Outcomes (CO)						
CO1	Do Problem Solving using algorithms					
CO2	Design and test simple programs to implement Object Oriented concepts using Java					
CO3	Document artifacts using common quality standards					
CO4	Design simple data store using RDBMS concepts and implement					

Focus Area 1: Object Oriented Programming using Java

Unit I:

Problem Solving Techniques: Introduction to problem solving, Computational problem and its classification - Logic and its types, Introduction to algorithms and flowchart, Searching algorithms: linear search, binary search and sorting algorithms: insertion, quick, merge and selection sort, Introduction and classification to Data Structures, Basic Data Structures: array, stack, and queue.

Unit II:

Programming Basics: Identifiers, variables, data types, operators, control structures, type conversion, casting, arrays, strings

Object Oriented Concepts fundamentals: class &object, instance variables & methods, access specifiers, reference variables, parameter passing techniques, constructors, this reference, static, and command line arguments

Introduction to UML: Use case diagrams – Class diagrams

Unit III:

Relationships: Use case diagrams – Class diagrams, Inheritance, types of inheritance, Static Polymorphism: method overloading, constructor overloading, Dynamic polymorphism: method overriding, abstract, interface, introduction to packages Industry Coding Standards and Best Practices, code tuning & optimization, clean code & refactoring

Focus Area 2: Relational Database Management System

Unit IV:

RDBMS- data processing, the database technology, data models, ER modelling concept, notations, converting ER diagram into relational schema, Logical database design, normalization (1NF, 2NF and 3NF)

SQL: DDL statements, DML statements, DCL statements, Joins, Sub queries, Views, Database design Issues, SQL fine-tuning

Books on Java

1. **Java**™: The **Complete Reference**,. Seventh Edition. Herbert Schildt
2. Programming with **Java 3e A Primer** by E **Balagurusamy**
3. Introduction to Java Programming by K. Somasundaram , Jaico Publishing House; 1 edition

Books on RDBMS, Oracle, MYSQL

1. Fundamentals of Database Systems, with E-book (3rd Edition) by Shamkant B. Navathe, Ramez Elmasri, Published January 15th 2002 by Addison Wesley Longman
2. MySQL by Paul DuBoisNew Riders Publishing
3. Murach's MySQL Paperback – 2012, by Joel Murach , Publisher: Shroff/Murach (2012)
4. SQL: The Complete Reference by James R. Groff, Paul N. Weinberg, Published March 1999 by McGraw-Hill Companies
5. Schaum's Outline of Fundamentals of Relational Databases by Ramon Mata-Toledo, Published November 15th 2000 by McGraw-Hill

CSE-306N	Mobile Computing					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**1**	**0**	**75**	**25**	**100**	**3 Hrs.**
Purpose	To impart knowledge of mobile and wireless computing systems and techniques.					
Course Outcomes(CO)						
CO1	Describe the concepts of mobile computing and cellular networks.					
CO2	Learn the basic concepts of wireless networks.					
CO3	Study of various issues of mobile computing and basics of cloud computing.					
CO4	Description and applications of Ad hoc networks.					

UNIT – I

Introduction, issues in mobile computing, overview of wireless telephony: cellular concept, Mobile computing Architecture, Design considerations for mobile computing, Mobile Computing through Internet, Making existing applications mobile enabled. GSM: air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in Cellular systems, WCDMA, GPRS 3G, 4G.

UNIT – II

Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP : Architecture, Traditional TCP, Classical TCP, improvements in WAP, WAP applications.

UNIT – III

Data management issues, data replication for mobile computers, adaptive clustering for mobilewireless networks, File system, Disconnected operations Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.

Cloud Architecture model, Types of Clouds: Public Private & Hybrid Clouds, Resource management and scheduling, Clustering, Data Processing in Cloud: Introduction to Map Reduce for Simplified data processing on Large clusters.

UNIT – IV

Ad hoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

Text Books:

1. Rajkamal, Mobile Computing, 2/E Oxford University Press,2011.
2. J. Schiller, Mobile Communications, Addison Wesley
3. Yi Bing Lin, Wireless and Mobile Networks Architecture , John Wiley.

Reference Books

1. A. Mehrotra , GSM System Engineering.
2. M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
3. Charles Perkins, Mobile IP, Addison Wesley.
4. Charles Perkins, Ad hoc Networks, Addison Wesley.
5. Judith Hurwitz, Robin Bllor, Marcia Kaufmann, Fern Halper, Cloud Computing forDummies, 2009.

CSE-308N	Web Engineering					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**1**	**-**	**75**	**25**	**100**	**3**
Purpose	To gain a broad understanding of the discipline of Web engineering and its application to the development and management of Web Applications.					
Course Outcomes						
CO1	Learn the basic concepts of information and web architecture.					
CO2	Learn about the skills that will enable to design and build high level web enabled applications.					
CO3	Understand the applicability of Java Script as per current software industry standards.					
CO4	Acquaint the latest programming language for the implementation of object based and procedure based applications using Python.					

Unit-1

Information Architecture: The role of Information Architect, Collaboration and communication, Organizing information, organizational challenges, Organizing web sites and Intranets, Creating cohesive organization systems, designing navigation systems, types of navigation systems, Integrated navigation elements, designing elegant navigation systems, Searching systems, Searching your web site, designing the search interface, Indexing the right stuff, To search or not to search grouping content, conceptual design, High level Architecture Blueprint. Architectural Page Mockups, Design Sketches.

Unit-2

Introduction to XHTML and HTML5: Origins and Evolution of HTML and XHTML, Basic Syntax, Standard XHTML Document Structure, Basic Text Markup, Images, Hypertext Links, Lists, Tables, Forms, HTML5, Syntactic Differences between HTML and XHTML.

Cascading Style Sheets: Introduction, Levels of Style Sheets, Style Specification Formats, Selector Forms, Property Value Forms, Font Properties, List Properties, Color, Alignment of Text, Box Model, Background Images, Conflict Resolution.

Unit -3

Java Script: Overview of JavaScript, Object Orientation and JavaScript, General Syntactic Characteristics, Primitives, Operations, and Expressions, Screen Output and Keyboard Input, Control Statements, Object Creation and Modification, Arrays, Functions, Constructors, Pattern Matching Using Regular Expressions, Errors in Scripts

Unit -4

Python: Introduction to Python, Data Types and Expressions, Control Statements, Strings and Text Files, Lists and Dictionaries, Design with Functions, Design with Classes

Text Books

1. By Peter Morville, Louis Rosenfeld, “Information Architecture on the World Wide Web”, O'Reilly Media, 2006.
2. Robert W. Sebesta, “Programming The World Wide Web”, Eight Edition, Pearson India, 2015.
3. Kenneth A. Lambert, “The Fundamentals of Python: First Programs”, 2011, Cengage Learning.

Reference Book

1. Thomas A Powell, “HTML The Complete Reference”, Tata McGraw Hill Publications.

CSE-310N	Software Engineering					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**1**	**-**	**75**	**25**	**100**	**3**
Purpose	To gain a broad understanding of the discipline of software engineering and its application to the development and management of software process.					
Course Outcomes(CO)						
CO1	To understand the basic concepts of Software Engineering.					
CO2	To learn about the skills that will enable to construct high quality software.					
CO3	To understand the software process models.					
CO4	To understand the fundamental concept of requirements engineering and Analysis Modelling.					
CO5	To understand the different design techniques and their implementation.					
CO6	To learn about software testing and maintenance measures.					

Unit-I

Introduction: Introduction to Software Engineering, Software Characteristics, Software Crisis, The Evolving role of Software, Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models, RAD, V Model.

Unit-II

Software Requirement Specification: Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Data Flow Diagrams, Decision Tables, SRS Document, IEEE Standard for SRS.

Software Quality: Software Quality, Concept of Software Quality Assurance (SQA), SEI-CMM Model. Introduction to Software Risk Management and Software Configuration Management

Unit-III

Software Design: Basic Concept of Software Design, Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion.

Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design.

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

Unit-IV

Software Construction: Software construction fundamentals, minimizing complexity, Top-Down and Bottom –Up programming, structured programming, Compliance with Design and Coding Standards.

Testing: Testing Objectives, Unit Testing, Integration Testing, system testing, Acceptance Testing, Regression Testing, Structural Testing, FunctionalTesting, debugging.

Maintenance: key issues, Types of software Maintenance, Cost of Maintenance, Software Re-Engineering.

Text Books:

1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.

Reference Books:

1. Pankaj Jalote, Software Engineering, Wiley India.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
3. Ian Sommerville, Software Engineering, Addison Wesley.

HS-303N	Business Intelligence & Entrepreneurship					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
4	**-**	**-**	**75**	**25**	**100**	**3**
Course Outcomes						
CO1	Students will be able understand who the entrepreneurs are and what competences needed to become an Entrepreneur					
CO2	Students will be able understand insights into the management, opportunity search, identification of a Product; market feasibility studies; project finalization etc. required for small business enterprises.					
CO3	Students can be able to write a report and do oral presentation on the topics such as product identification, business idea, export marketing etc.					
CO4	Students be able to know the different financial and other assistance available for the establishing small industrial units.					

Unit -I

Entrepreneurship: Concept and Definitions; Entrepreneurship and Economic Development; Classification and Types of Entrepreneurs; Entrepreneurial Competencies; Factor Affecting Entrepreneurial Growth – Economic, Non-Economic Factors; EDP Programmes; Entrepreneurial Training; Traits/Qualities of an Entrepreneurs; Entrepreneur; Manager Vs. Entrepreneur.

Unit -II

Opportunity / Identification and Product Selection: Entrepreneurial Opportunity Search and Identification; Criteria to Select a Product; Conducting Feasibility Studies; Project Finalization; Sources of Information.

Unit -III

Small Enterprises and Enterprise Launching Formalities : Definition of Small Scale; Rationale; Objective; Scope; Role of SSI in Economic Development of India; SSI; Registration; NOC from Pollution Board; Machinery and Equipment Selection; Project Report Preparation; Specimen of Project Report; Project Planning and Scheduling using Networking Techniques of PERT / CPM; Methods of Project Appraisal.

Unit -IV

Role of Support Institutions and Management of Small Business : Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISBUD; State Financial Corporation SIC; Marketing Management; Production Management; Finance Management; Human Resource Management; Export Marketing; Case Studies-At least one in whole course.

Text Books:

1. Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi -Desai, Vasant, 2003.
2. Entrepreneurship Management -Cynthia, Kaulgud, Aruna, Vikas Publishing House, Delhi, 2003.
3. Entrepreneurship Ideas in Action- L. Greene, Thomson Asia Pvt. Ltd., Singapore, 2004.

CSE-312N	Web Engineering Lab					
Lecture	**Tutorial**	**Practical**	**Minor Test**	**Practical**	**Total**	**Time**
0	**0**	**3**	**40**	**60**	**100**	**3 Hrs.**
Purpose	To introduce the concepts of HTML5, JavaScript and Python.					
Course Outcomes (CO)						
CO1	Design webpages using HTML, JavaScript and CSS.					
CO2	Design and test simple function/program to implement Searching and sorting techniques using Python.					
CO3	Develop program in Java Script for pattern matching using regular expressions and errors in scripts.					
CO4	Design client-server based web applications.					

[1] Create your own page with your favorite hobbies using HTML, JavaScript and CSS.

[2] Create a frameset in HTML that is divided into three sections. The frameset should have three zones.
   a. The Topmost section of the frameset should take up about just 15% of the browser window. Name this frame title.
   b. The middle section should be 75% of the browser window. Name this frame title.
   c. The lower section should be 10% of the browser window. Name this frame menu.

[3] Create pages for each section. For the lowermost section, create page that loads the content into the middle section. The topmost section should contain a page describing the web page itself.

[4] Create a web page, which displays the map of your country Link, each city /state on the image map, such that the respective HTML page of the city/state is displayed when the user selects an area.

[5] Add the tickertape applet to your page by customizing it for the following settings:
   a. Increase the count by one.
   b. Accordingly update the message count.
   c. Change the text color to (237,192,171)
   d. Experiment with changing the scrolling speed.
   e. Customize the message text as per your page requirement.

[6] Incorporate a quest book into the Diary Food Webpage and use Java Script to build validations into the form.

[7] Use Cascading Style sheets (CSS) to modify the following:
   a. Change background.
   b. Change font type, face and color.
   c. Align Text.
   d. Remove underlines from hyperlinks.

[8] Write the program for using JavaScript by using for – loops (through a block of code a number of times), for/in - loops (through the properties of an object), while - loops (through a block of code while a specified condition is true), do/while - loops (through a block of code while a specified condition is true).

[9] Write a program in Java Script for the following:
   a. Copying, passing, and comparing by value
   b. Copying, passing, and comparing by reference
   c. References themselves are passed by value

[10] Write program in Java Script for pattern matching using regular expressions and errors in scripts.

[11] Write a Python function/program that accepts the lengths of three sides of a triangle as inputs. The program output should indicate whether or not the triangle is an equilateral triangle.

[12] Write the Python functions for linear search, binary search, selection sort, Bubble Sort, Insertion Sort and converting Fibonacci to a linear algorithm.

[13] Write program in Python using Lists and dictionaries, Control statements and Strings and text files.

CSE-314N	Essentials of Information Technology Lab					
Lecture	**Tutorial**	**Practical**	**Minor Test**	**Practical**	**Total**	**Time**
0	**0**	**3**	**40**	**60**	**100**	**3 Hrs.**
Purpose	To introduce the concepts of Object Oriented Programming using Java and RDBMS					
Course Outcomes (CO)						
CO1	Do Problem Solving using algorithms					
CO2	Design and test simple programs to implement Object Oriented concepts using Java					
CO3	Document artifacts using common quality standards					
CO4	Design simple data store using RDBMS concepts and implement					

Students should implement at least 4-5 problems from the real world related to concern engineering branch for following both focus area during Practical hours:

1. Programs using Java Language
2. RDBMS Queries using MySQL

Tools:

- Understanding basic programming constructs using Scratch Tool - Flowcharts implementation through RAPTOR tool
- Eclipse IDE for Java programming

CSE-316N	Software Engineering Lab					
Lecture	**Tutorial**	**Practical**	**Minor Test**	**Practical**	**Total**	**Time**
-	**-**	**3**	**40**	**60**	**100**	**3**
Purpose	To gain a broad understanding of the discipline of software engineering implementation.					
Course Outcomes						
CO1	To understand the basic concepts of Software Engineering.					
CO2	To learn about the reasons for the software crisis.					
CO3	To understand the software testing techniques.					
CO4	To understand the software metrics.					
CO5	To understand the different design techniques and their implementation.					
CO6	To learn about software testing and maintenance measures.					

List of Practical's

1. To identify the role of the software in today's world across a few significant domains related to day to day life.
2. To identify the problem related to software crisis for a given scenario.
3. To classify the requirement into functional and non-functional requirements.
4. To implement at least four software metrics.
5. Preparation of requirement document for standard application problems in standard format.(e.g Library Management System, Railway Reservation system, Hospital management System, University Admission system)
6. To prepare Project Schedule for standard application problems in standard format.
7. To implement the functional testing techniques.
8. To implement the structural testing techniques