

BIV-01

2018-19

Dr G.R.DAMODARAN COLLEGE OF SCIENCE(AUTONOMOUS),COIMBATORE - 14

DEPARTMENT OF COMPUTER SCIENCE

Scheme of Examination (under CBCS) - B.Sc (Computer Science)

For the candidates admitted from the Academic Year 2018 - 2019

Sem	Part	Course	Course Title	Credits	Marks			Hrs/week	Exam Duration
					CAM	TEE	Total		
I	I	Language	Tamil I / Hindi I / French I / Malayalam I	3	25	75	100	5	
	II	English	English I	3	25	75	100	5	
	III	Core	Digital Logic and Computer Architecture	4	25	75	100	6	
	III	Allied	Numerical and Statistical Methods	5	25	75	100	5	
	III	Core	Web Designing Lab	2	40	60	100	6	
	IV	Skilled Based Subject	General Awareness	2	25	75	100	3	
II	I	Language	Tamil II / Hindi II / French II / Malayalam II	3	25	75	100	5	
	II	English	English II	3	25	75	100	5	
	III	Core	C Programming	4	25	75	100	4	
	III	Allied	Discrete Mathematics	5	25	75	100	4	
	III	Core	Data Structures	3	25	75	100	4	
	III	Skilled Based Subject	C Programming Lab	2	40	60	100	6	
	IV	Environmental Studies	Environmental Awareness	2	25	75	100	2	
III	I	Language	Tamil III / Hindi III / French III / Malayalam III	3	25	75	100	5	Theory TEE : 3 hrs : Practicals TEE : 3hrs
	II	English	English III	3	25	75	100	5	
	IV	Basic Tamil / Advanced Tamil	Basic Tamil I /Advanced Tamil I	2	100	NA	100	2	
			Non- major Elective		40	60			
	III	Core	Microprocessors	4	25	75	100	3	
	III	Core	Object Oriented Programming with C++	4	25	75	100	3	
	III	Allied	Operations Research	5	25	75	100	3	
	III	Core	C++ Programming Lab	3	40	60	100	5	
	IV	Skilled Based Subject	Professional Communication	2	25	75	100	4	
	V	Extension Activities	NSS / Computer Awareness Programme	1	Grade **			-	
IV	I	Language	Tamil IV / Hindi IV / French IV / Malayalam IV	3	25	75	100	5	
	II	English	English IV	3	25	75	100	5	
	IV	Basic Tamil / Advanced Tamil	Basic Tamil II /Advanced Tamil II	2	100	NA	100	2	
			Non- major Elective		40	60			
	III	Core	Database Management System	3	25	75	100	4	
	III	Core	Python Programming	3	25	75	100	3	
	III	Allied	Principles of Management	5	25	75	100	3	
	IV	Value Education	Indian Society, People and Culture	2	25	75	100	3	
III	Skilled Based Subject	Python and DBMS Lab	2	40	60	100	5		
V	III	Core	Cyber Security	4	25	75	100	4	
	III	Core	Java Programming	4	25	75	100	5	
	III	Core	Operating Systems	4	25	75	100	4	
	III	Core	Software Engineering	4	25	75	100	5	
	III	Elective	Elective - I	4	25	75	100	5	
	III	Core	Java Programming Lab	3	40	60	100	5	
	IV	Skilled Based Subject	Aptitude*	2	25	75	100	2	
VI	III	Core	Computer Networks	4	25	75	100	3	
	III	Core	Web Technology	4	25	75	100	4	
	III	Core	Web Technology Lab	3	40	60	100	5	
	III	Core	Project and Viva Voce	7	25	75	100	12	
	III	Elective	Elective - II	4	25	75	100	4	
	IV	Skilled Based Subject	Soft Skills *	2	25	75	100	2	
Total				140	1195	3105	4200	180	

NA : Not Applicable, Basic / Advanced Tamil - CA only

* Both CAM and TEE marks will be evaluated internally.

Elective List-I

- 1 Augmented Reality
- 2 Big Data Analytics
- 3 Open Source Software
- 4 Computer Graphics and Multimedia
- 5 Embedded System and its Applications
- 6 Software Testing
- 7 Air and Sea Navigation
- 8 Scripting Languages

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Elective List-II

- 1 Mobile Programming
- 2 Cloud Computing
- 3 Introduction to Internet of Things
- 4 Software Quality and Assurance
- 5 Enterprise Resource Planning
- 6 Intellectual Property Rights
- 7 SOA and Web Services
- 8 Network and Information Security

Project & Viva Voce Split up	
CA (25 marks)	
Review I	10 Marks
Review II	15 Marks
TEE (75 Marks)	
Viva-Voce	50 Marks
Documentation	25 Marks



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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIRST SEMESTER

CORE: DIGITAL LOGIC AND COMPUTER ARCHITECTURE

Objective of the subject: The objective is to provide the students an insight into the fundamental building blocks of a computer. To provide the basic knowledge on computer arithmetic, machine language Instruction Set, Counters, I/O and System Bus Design and Memory Systems.

UNIT I: (10 Hrs)

Number Systems: Decimal, Binary, Octal and Hexadecimal – Conversion from one to another – Binary Addition, Subtraction, Multiplication and Division – Complements in binary and other number systems – ASCII codes – BCD weighted – Excess three – Gray codes.

UNIT II: (10 Hrs)

Logic gates : AND, OR, NOT, XOR, NAND, NOR and XNOR gates – Truth tables – NAND and NOR as Universal Building Block – Laws of Boolean Algebra – DeMorgan's Theorem – Simplification of Boolean expressions – Karnaugh Maps – Two and Three variable maps – Four Variable Map – Product of Sums and Sum of products simplification – Don't care conditions.

UNIT III: (10 Hrs)

Combination Logic : Introduction – Adders – Binary Half adder – Full adder – Parallel Binary adder – Serial Binary adder – BCD Adder – Subtractors – Half subtractor – Full Subtractor – Decoders – Encoders – Multiplexers – Demultiplexers.

UNIT IV: (10 Hrs)

Input-Output organization: Input-output Interface - I/O Bus and Interface Modules- Asynchronous data transfer (strobe control and handshaking) - Modes of transfer: Programmed I/O - Interrupt Initiated I/O - Software Considerations. Input-output processor: CPU-IOP Communication.

UNIT V: (10 Hrs)

Memory organization: Memory hierarchy. Main memory: RAM and ROM Chips - Cache memory: Associative Mapping- Direct Mapping. Virtual memory: Address Space & Memory Space- Address Mapping Using Pages-Associative memory Page Table-Page Replacement.

TEXTBOOKS

1. **Digital Logic and Computer Design**, M.Morris Mano, Prentice Hall, 14th Impression 2012.
2. **Digital Computer Fundamentals**, Thomas C.Bartee, Tata McGrawHill, Sixth Edition, 23rd Reprint, 2011.
3. **Computer System Architecture**, M. Morris Mano, Prentice Hall of India Publications, 3rd Edition, 8th Impression, 2011.

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Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIRST SEMESTER

ALLIED: NUMERICAL AND STATISTICAL METHODS

(No derivations problems only)

Objective of the Subject: The course objective is to teach efficient algorithms for numerical computations, interpolation and extrapolation methods. This paper covers the concepts of Matrices, Numerical methods and Statistics.

UNIT I:

(10 Hrs)

Matrices: Types – Determinant & its properties – Inverse of a matrix – Eigen Values and Eigen vectors – Cay ley's Hamilton theorem.

UNIT II:

(10 Hrs)

Numerical Methods: Systems of simultaneous Linear equations – Gauss elimination Gauss Jordan, Gauss Jacobi Methods. **Numerical integration:** Trapezoidal rule, Simpson's 1/3 & 3/8 rule.

UNIT III:

(10 Hrs)

Numerical Interpolation: Newton's Forward & Backward method – Lagrange's interpolation. **Solution of ordinary differential equations:** Taylor's series, Runge – Kutta method of second and fourth order.

UNIT IV:

(10 Hrs)

Measures of central value: Mean, Median, Mode. **Measures of Dispersions:** Range, Standard Deviation and Variance.

UNIT V:

(10 Hrs)

Correlation: Karl Pearson's Coefficient of Correlation – Rank correlation. **Regression –** Regression equations. **Curve fitting –** method of least squares (Fitting straight lines only).

TEXT BOOKS

1. **Numerical Methods In Science & Engineering**, M. K. Venkataraman, National Publishing Company, September 2007, 5th Edition.
2. **Statistical Methods**, S.P. Gupta, Sultan Chand & Company Limited, 2014, Revised edition.
3. **Discrete Mathematics for Computer Science & Applications**, P.Radha, T. Santha, 2002, Second Edition.

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Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIRST SEMESTER
CORE: WEB DESIGNING LAB

Objective of the Subject: This paper provides a hands-on experience on working with HTML pages, designing of CSS and embedding CSS with HTML versions 4 and 5.

With reference to HTML4

Create HTML Page using the following concepts.

1. Formatting tags
2. Hyperlinks
3. Tables
4. Frames
5. Linking to a segment of a Page. (Fragments)
6. Images and text wrapping around images
7. Lists
8. Templates
9. Forms using basic controls
10. Forms using List controls

Create a CSS to format the following.

11. Links
12. Integration of CSS with HTML

With reference to HTML 5

13. Write a HTML5 program to implement Drag and Drop operations
14. Write a HTML5 program to implement any two events.

Note:

Develop a project / case study using the above applicable concepts.

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
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SECOND SEMESTER

CORE: C PROGRAMMING

Objective of the subject: Programming is an essential part of Computer Science. This paper covers the basic aspects of programming starts with the building blocks of a program, taking into consideration the C Language. Concepts like arrays, functions, storage classes, pointers, files and command line arguments are discussed.

UNIT I:

(10 Hrs)

Introductory Concepts: Introduction to C Programming – C Fundamentals: The C Character Set – Identifiers and Keywords – Data Types – Constants – Variables and Arrays – Declarations – Expressions – Statements – Symbolic Constants – Operators and Expressions: Arithmetic Operators – Unary Operators - Relational and Logical Operators – Assignment Operators – The Conditional Operator – Library Functions – Data Input and Output: Getchar and Puchar Function – The scanf function-More About scanf Function - The printf function-More About printf Function – The Gets and Puts Functions

UNIT II:

(10 Hrs)

Control Statements: The If-else, The While, Do-while, For, Nested control structures, Switch, break, The Continue statement- The Comma Operator-The Goto Statement – **Functions:** A Brief Overview - Defining a Functions– Accessing a Function – Function Prototypes -Passing Arguments to a Function – Recursion – String Handling functions.

UNIT III:

(9 Hrs)

Program Structure: Storage Classes – Automatic Variables – External (Global)Variables – Static Variables – **Arrays:** Defining an Array – Processing an Array – Passing Arrays to Functions – **Multidimensional Arrays** – **Strings:** Defining a string-Reading and writing a string-Processing the strings-Searching and sorting of strings

UNIT IV:

(11 Hrs)

Pointers - Fundamentals – Pointer Declarations – Passing Pointers to Function – Pointers and One-Dimensional Arrays – Operations on Pointers – Pointers and Multidimensional Arrays – Arrays of Pointers – Passing Functions to other Functions – More about Pointer Declarations – **Structures & Unions:** Defining a Structure – Processing a Structure – User-Defined Data Types (Typedef) – Structures and Pointers – Passing Structures to Functions-Self - Referential structures – Unions

UNIT V:

(10 Hrs)

File Handling: Opening and Closing a Data File – Reading and Writing a Data File – Processing a Data File – Unformatted Data Files –Bitwise Operations- Additional Features of C: Enumeration - Command Line Parameters – Macros – The C Preprocessor.

TEXT BOOK

1. Programming with C, Byron S. Gottfried, Tata McGraw Hill, Third Edition, 2012
2. Let Us C, Yashawant Kanetkar, BPB Publications, 14th Edition, 2016.

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B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SECOND SEMESTER

ALLIED: DISCRETE MATHEMATICS

Objective of the Subject: This course is designed to provide an introduction to discrete mathematics. Topics covered include sets, functions, math induction, combinatorics, recurrence, graph theory, trees, and networks.

UNIT I:

(10 Hrs)

Mathematical Logic: Connective, well-formed formula, tautology equivalence of formulas, tautological implications, duality law. Normal Forms. Theory of inference for statement calculus.

UNIT II:

(10 Hrs)

Relation and functions: Composition of relations, equivalence of relations – Functions – composition of functions, inverse functions, one-to-one, on-to, one to, one-on-to functions.

UNIT III:

(10 Hrs)

Formal Languages and Automata: Grammars, phrase-structure grammar, context-sensitive grammar, context-free grammar, regular grammar and finite state automata – conversion of non-deterministic finite automata to finite state automata.

UNIT IV:

(10 Hrs)

Lattice and Boolean Algebra: Partial ordering, poset, lattices, distributive lattices - complemented distributive lattices – Boolean algebra – Minimization of Boolean function using K-map

UNIT V:

(10 Hrs)

Graph Theory: Directed and undirected graphs, connected graphs, path, reachability, circuits, Hamiltonian paths, Euler graphs – Matrix representation of directed and undirected graphs, incidence matrix, and adjacency matrix. Trees - binary tree, expression trees. Traversals of binary trees. Theorems – statements only for both graphs and trees (no proof)

TEXT BOOK

1. **Discrete Mathematical Structures with Applications to Computer Science**, J.P Tremblay, R P Manohar, Tata McGraw Hill, 38th Reprint, 2010.

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SECOND SEMESTER

CORE: DATA STRUCTURES

Objective of the subject: To provide the students with the basic understanding of data structures for more efficient program writing. This paper focuses on various data storage and manipulation structures like arrays, records, stacks, queues, recursion, trees and sorting techniques.

UNIT I:

(12 Hrs)

Introduction and Overview: Basic terminology – Data structures – Data structure operations .
Arrays, Records: Linear arrays – Representation of linear arrays – Traversing linear array –
Inserting and deleting – Linear search – Multidimensional arrays – Records.

UNIT II:

(10 Hrs)

Sorting: Sorting - Bubble sort – Quick sort – Insertion sort.
Linked list: Linked lists – Representation in memory – Traversing linked list – Garbage
collection – Insertion and deletion in linked list - Header linked lists – Two-way lists.

UNIT III:

(10 Hrs)

Stacks, Queues and Recursion: Stacks – Array representation of stacks – Linked
representation of stack – Arithmetic expressions – Recursion – Tower of Hanoi – Queue –
Linked representation of Queues.

UNIT IV:

(8 Hrs)

Trees: Introduction – Binary trees – Representing binary trees in memory – Traversing binary
trees – Binary search trees – Searching, Inserting and Deleting in a binary search tree –
Sorting Techniques.

UNIT V:

(10 Hrs)

Graphs and Applications: Graph theory terminology – Sequential representation of graph –
Adjacency matrix – Linked Representation of Graph - Operations on graph – Traversing a
graph.

TEXT BOOK

1.Data Structures Schaum's Outlines, Seymour Lipschutz, G.A Vijayalakshmi Pai, Tata
McGraw-Hill Companies, 2006, Indian Adapted Edition

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Effective from the academic year: 2018 – 2019

SECOND SEMESTER
SKILLED BASED SUBJECT: C PROGRAMMING LAB

Objective of the subject: The main objective is to develop C programming in an Open Source Platform and to provide an introduction of the C programming language emphasizing Data Structure exercises. The course will mainly cover the following topics like General structure and organization of a C program , Basic Components, Arrays and Pointers, Functions, Strings, structures, command line arguments etc.

C Exercises

1. Operators and expressions
2. Ternary operator.
3. Control statements
4. Functions.
5. Arrays.
6. Strings
7. Pointers.
8. Structures.
9. Files
10. Command line parameters.

Data Structure Exercises (Implement the concepts in C)

11. Concepts of Stack
12. Queues
13. Binary Tree
14. Sorting (any two sorting)
15. Searching

Note :

Develop a project / case study using the above applicable concepts.

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B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

THIRD SEMESTER
Core: MICROPROCESSORS

Objective of the Subject : The overall objectives is to provide a basic understanding with the basic components of 8086 & 8088 instruction set architecture, inspect and modify 8086 processor registers and memory, write and run basic assembly programs along with 80286 processors.

UNIT I:

(10 Hrs)

Microprocessors – General Architecture of a Microcomputer system – Reprogrammable and Embedded Microprocessors - Micro architecture of the 8088/8086 Microprocessor – Software model of the 8088/8086 Microprocessor - Memory Address space and Data Organization – Data types – Segment registers and Memory Segmentation – Instruction Pointer – Data registers – Pointer and Index registers – Status Register - MOV Instruction- Addressing modes.

UNIT II:

(10 Hrs)

Data transfer Instruction: MOV,XCHG instructions – Arithmetic Instructions: Addition of Binary Numbers, ADD,ADC,INC,AAA and DAA- Subtraction of Binary numbers, SUB, SBB, DEC,AAS,DAS and NEG- Multiplication and Division instructions: MUL,DIV, IMUL,IDIV, AAM,AAD,CBW&CWD- Logic instructions : AND,OR,XOR and NOT – Shift instruction: SHL,SHR,SAL&SAR – Rotate Instructions: ROL,ROR,RCL&RCR.

UNIT III:

(10 Hrs)

Flag control & compare instructions – unconditional and conditional jump – Branch instruction: IF-THEN-ELSE – REPEAT-UNTIL& WHILE-DO – CALL & RETURN – PUSH&POP instructions. 8088&8086 microprocessors: Minimum-mode & Maximum-mode systems – 82C55A PPI – 82C54 programmable Interval timer: Block diagram & Architecture.

UNIT IV:

(10Hrs)

82C37A Programmable DMA controller: Microprocessor interface of the 82C37A, DMA interface of the 82C37A, Internal Architecture of 82C37A - Programmable communication interface controller: 8251AUSART-KeyBoard and display interface. Interrupt mechanism – types& priority – interrupt Vector table – interrupt instructions –enabling/disabling of interrupts – External hardware – interrupt interface signals.

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UNIT V:

(10 Hrs)

80286 microprocessor – Internal architecture – 80386 microprocessor family – internal architecture of 80386DX – 80486 microprocessor family – Internal architecture of 80486 – Pentium processor family: Internal architecture – Pentium Pro Processor and Pentium II – Celeron – Pentium III & Pentium IV. Superscalar Organisation - An Overview.

TEXT BOOKS

1. **The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware and Applications**, Walter A.Triebel, Avtar Singh, Pearson Education Ltd., Fourth Edition, Tenth impression, 2013.
2. **Modern Processor Design**, John Paul Shen, Waveland Press Inc, 2013.
3. **Microprocessors and Interfacing**, Vaneet Singh, Satyaprakasan Publishers, 2016.

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Effective from the academic year: 2018 – 2019

THIRD SEMESTER

CORE: OBJECT ORIENTED PROGRAMMING WITH C++

Objective of the subject: This course provides in-depth coverage of object-oriented programming principles and techniques using C++. Topics include classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features

UNIT I:

(8 Hrs)

Object Oriented Paradigm-Evolution of programming paradigms-elements of object oriented programming-Objects-Classes-Encapsulation and Data abstraction-Inheritance-Polymorphism- Stream Based I/O-Comment line-Literals-Scope resolution operator- Type conversion-Data Types-Character set- Tokens, Identifiers, and keywords-Variables-Operators and Expressions-arithmetic-relational-logical-bitwise-compound-increment and decrement-ternary

UNIT II:

(10 hrs)

Control structures and Looping Statements – Arrays:–Operations on arrays-multi-dimensional-String - arrays of strings- Functions:–Function components-passing data to functions-return-parameter passing-default arguments- Inline functions-Function overloading-Recursive- Pointers

UNIT III:

(11 hrs)

Classes and Objects – Class specification-class objects-accessing class members-defining member functions-accessing member functions within class-Data hiding-Friend functions and friend classes-Static data and member functions- Object Initialization and Cleanup – Constructors-Parameterized constructors-Destructor-Constructor overloading-Constructor with default arguments-Dynamic initialization through constructor-Copy constructor-Dynamic Objects-Pointers to objects-Array of objects-This pointer

UNIT IV:

(11 hrs)

Operator Overloading –Unary operator overloading-operator keyword-Operator return values-Increment/decrement operators-Binary operator overloading-Arithmetic operators-Arithmetic assignment operators- Inheritance –Derived class declaration-Forms of inheritance-Inheritance and member accessibility-Multilevel-Multiple-Hierarchical inheritance- Virtual Functions-Need for virtual functions-Pointer to derived class objects-Definition of virtual functions-Pure virtual functions-Virtual destructors-Rules for virtual functions

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UNIT V:

(10 hrs)

Generic Programming with Templates –Function templates-Overloaded function templates- Multiple arguments function templates-Class templates-Streams Computation with Console-Formatted and unformatted I/O operations-Stream Computation with Files–Opening and closing of files-Testing for errors-File modes-Sequential access-File I/O with fstream class-Random access- Exception Handling-. Exception handling model, constructs-List of Exceptions-Catch all Exceptions

TEXT BOOKS

1. **Mastering C++**, K.R. Venugopal, Rajkumar Buyya, T.Ravishankar, , Tata McGraw Hill Publishing Company Limited, 2010.
2. **The Complete Reference in C++**, Herbert Schildt, Tata McGraw Hill Publishing Company Limited, Fourth Edition, 2010

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Effective from the academic year: 2018 – 2019

THIRD SEMESTER
Allied: OPERATIONS RESEARCH
(No Derivations; Problems only)

Objective of the Subject: Introduction to operations research, the methodology of mathematical modeling, the decision analysis, and its relation to problems in industrial, commercial, and public systems. The emphasis is on the use of linear mathematical programming including the simplex method, transportation problems, replacement problems, queuing systems etc.

UNIT I:

(12 Hrs)

Linear Programming Problem: Mathematical Formulation of the problem – Graphical Solution Method - Simplex method - Big-M method –Dual Simplex Method.

UNIT II:

(10 Hrs)

Transportation Problem: Introduction – Finding an Initial basic feasible solution (North – West Corner Method, Least-Cost Method & Vogel's Approximation Method) – Test for Optimality. Assignment Problem: Introduction - Hungarian Method.

UNIT III:

(10 Hrs)

Inventory Control: Introduction – Objectives of scientific inventory control - Various costs involved in inventory – Deterministic Inventory Problem with and without shortages – Problem of EOQ with price breaks.

UNIT IV:

(8 Hrs)

Queuing Theory: Introduction – Queueing system – Elements of a queueing system – Operating characteristics of a queueing system- Poisson queueing systems- $\{(M/M/1):(\infty/FIFO)\}$ and $\{(M/M/1):(N/ FIFO)\}$.

UNIT V:

(10Hrs)

Games and Strategies: Introduction – Two-Person Zero-Sum games – Some basic terms – The Maximin- Minimax Principle – Games without saddle point-Mixed Strategies – Graphic Solution of $2 \times n$ and $m \times 2$ games.

Network Scheduling by PERT/CPM: Network: Basic Components – Rules of network construction –Critical path analysis: Forward & Backward Pass Calculations. PERT Calculations.

TEXT BOOKS

1. **Operations Research**, Kanti Swarup, P.K.Gupta, Manmohan, Sultan Chand & Sons, 2012, 16th Edition.
2. **Problems in Operations Research**, P.K. Gupta, Dr.D.S.Hira, S. Chand & Company, Reprint 2010.

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Effective from the academic year: 2018 – 2019

THIRD SEMESTER

CORE: C++ PROGRAMMING LAB

Objective of the subject: The main objective is to develop C++ programming in an Open Source Platform.. The goals of this course are to introduce students the C++ Programming Languages concept including data types, operators, control structures, arrays and parameter passing. It also gives a hands-on experience on implementing the OOPS concepts like overloading, virtual function, inheritance, files, exception handling and template concepts.

Develop programs using the following concepts:

1. Class and Objects
2. Arrays
3. Functions
 - i) Friend
 - ii) Inline
 - iii) Recursive
 - iv) Virtual
4. Constructors, Destructors and the types of Constructors
5. Overloading concepts.
 - i) Function Overloading
 - ii) Operator Overloading
6. Inheritance
7. Dynamic memory management using new, delete operators.
8. Pointers
9. Templates
10. Exception Handling
11. Files

Develop a project / case study using the above applicable concepts.



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Effective from the academic year: 2018 – 2019

FOURTH SEMESTER

CORE: DATABASE MANAGEMENT SYSTEM

Objective of the subject: This course is an introductory course on database management systems. The course deals with the notion of database systems from the user point of view and to introduce the fundamental concepts of database systems, acquaint the students with the use of current database systems and build a solid foundation for advanced studies in database area.

UNIT I: (8 Hrs)

Introduction: Database System Applications- Purpose of Database systems- View of Data – Database Languages – Database Architecture - Database Users and Administrator. Data Models: Types of Data Models.

UNIT II: (10 Hrs)

Database design and the E-R model: The Entity Relationship model – Constraints – Removing Redundant attributes in Entity sets - E-R diagram. Introduction to the Relational model: Structure of Relational Databases – Database Schema – Keys – Relational Query Languages - Relational operations.

UNIT III: (10 Hrs)

Relational database design: Features of good relational designs – Atomic domains and First Normal Form – Decomposition using functional dependencies – Functional dependency theory – Decomposition using multivalued dependencies.

UNIT IV: (12 Hrs)

Overview of NoSQL : NoSQL Databases – About NoSQL – Difference between RDBMS and NoSQL – Benefits of NoSQL Database – Types of NoSQL database. MongoDB: Overview of MongoDB – Advantages of MongoDB over RDBMS- MongoDB Data Types - Creating and deleting database – Creation, Inserting, Update, Deleting the documents.

UNIT V: (10 Hrs)

MySQL: Brief History of MySQL – SQL Statements - DDL – DML – Subqueries – Unions – Joins – Aggregate functions – Groupings - View and Trigger.

TEXT BOOKS

1. **Database System Concepts**, Henry F.Korth, Abraham Silberschatz, & S. Sudarshan, Tata McGraw-Hill Publishing Company, 6th Edition, 2011.
2. **Database Systems Using Oracle**, Nilesh Shah, PHI Learning Pvt. Ltd, 2nd edition, 2005.
3. **MongoDB: The Definitive Guide**, Kristina Chodorow, O'Reilly Media Publisher, 2nd Edition, 2013.
4. **NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence**, Pramod J. Sadalage, Martin Fowler, 1st Kindle Edition, 2014.
5. **Murach's MySQL**, Joel Murach, 2nd Edition, 2012.

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FOURTH SEMESTER
CORE: PYTHON PROGRAMMING

Objective of the subject: The focus of the course is to provide students with an introduction to programming, install and run the Python interpreter - I/O – Tuples – Class and Object – Files using the Python programming language.

Unit I **(10 Hrs)**

Introduction to Python: Overview – History of Python – Python features – **Environment** - Environment setup – Getting Python – Install Python – Setting up Path – Running Python – **Basic Syntax** – Hello World – Interactive mode programming – Script mode Programming – A simple Python example.

Unit II **(10 Hrs)**

Programming Basics of Python: Python Keywords – Identifiers – Rules for writing Identifiers – Reserved words – Lines and Indentation – Multiline statements – Python Variable – Variable Assignment – Multiple Assignment - **Standard Data Types:** Numbers: int, float and decimal – **Basic Operators:** Arithmetic Operators – Comparison (Relational) Operators – Assignment Operators – Logical Operators – Bitwise Operators – Membership Operators – Identity Operators – **Loops:** Types of loops – while – for Loops – **Control statements:** if ...else – for loop – break and continue.

Unit III **(10 Hrs)**

Programming with Python: Functions: Introduction – Using a Function - Communicating with Functions – Example of creating a simple calculator using functions – **Lists:** Accessing values in Lists – Updating Lists – Delete List elements – Built-in Lists functions & Methods – **Tuples:** Creating Tuples – Accessing Tuples – Updating Tuples – Deleting Tuples – Basic Tuple operations - Built-in Tuple functions – **Dictionary:** Access, Update and Delete dictionary elements – Built-in Dictionary Functions & Methods.

Unit IV **(10 Hrs)**

Object Oriented Programming: Classes and Objects: Creating a Class – Using a Class – Constructor, class attributes and destructors - Inheritance - A simple Inheritance – Multiple Inheritance, overlapping and overloading operators **Exception Handling:** Try, Except and Finally.

Unit V **(10 Hrs)**

Advanced Concepts: Files I/O: Opening a file – Seek and Find a file – Other I/O functions - **Database and SQL:** Database – SQLDB – Database connection Parameters – Insert, Update, Delete – **Sending Mail:** SMTP protocol – Syntax – Sending Email using Python.

TEXT BOOKS:

1. Python for Everybody, Exploring Data Using Python, Charles Severance, kindle Publication, 2016.
2. Python: Programming For Beginners: Learn The Fundamentals of Python in 7 Days Kindle Edition, 2012.
3. www.udemy.com

B IV - 18

2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)

Effective from the academic year: 2018 – 2019

2. **Essentials of Management**, Joseph L Massie, Prentice Hall of India, (Pearson) Fourth Edition, 2010.
3. **Principles of Management**, Tripathy PC And Reddy PN, Tata McGraw-Hill, 5th reprint 2012.
4. **Personnel and Human Resources Management**, Decenzo David, Robbin Stephen A, Prentice Hall of India, 1996



BIV-19
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FOURTH SEMESTER
ALLIED: PRINCIPLES OF MANAGEMENT

Objective of the subject: This course will give an overview of the various functions of an Organization. It will give an insight into the activities of and various roles and responsibilities of various functional level managers.

UNIT I: (10 Hrs)

Definition of Management - Science or Art - Management and Administration - Development of Management Thought - Types of Business Organization.

UNIT II: (10 Hrs)

Purpose of Planning - Steps in Planning - - Setting Objectives - Managing by Objectives – Forecasting - Strategies - Policies - Decision-making.

UNIT III: (10 Hrs)

Organising - Nature and Purpose – Structure - Formal and informal - Line and Staff authority – Centralization Vs Decentralization – Authority Vs Responsibility - Staffing - Selection - Managerial Effectiveness.

UNIT IV: (10 Hrs)

Directing - Scope – Objectives. Leadership - Types of Leadership. Motivation - Hierarchy of needs - Motivation theories - Motivational Techniques - Job Enrichment - Communication - Process of Communication - Barriers and Breakdown - Effective Communication - Electronic media in Communication

UNIT V: (10 Hrs)

System and process of Controlling - Requirements for effective control - The Budget as Control Technique - Information Technology in Controlling - Use of computers in handling the information - Productivity - Problems and Management - Control of Overall Performance - Direct and Preventive Control - Reporting

TEXT BOOKS

1. **Essentials of Management**, Harold Kooritz & Heinz Wehrich, Tata McGraw-Hill, 8th Edition, 2011.



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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FOURTH SEMESTER

Skill Based Subject: Python and DBMS Lab

Objective of the Subject: The course provides hands-on experience to develop simple applications Python Programming. It also provides experience for manipulation of data at back end such as creating tables, exceptions, triggers, procedures and cursors in an open source platform.

Python Exercises

1. Install and execute python interpreter
2. String functions
3. Binary functions
4. Looping and Control Statements
5. Functions
6. Lists
7. Tuples
8. Dictionaries
9. File Handling

MySQL Exercises

1. Table Creation and Inserting Values.
2. Queries using DDL and DML Commands.
3. Aggregate functions
4. Join
5. Trigger.
6. Views
7. Procedures

Note:

Develop a project / case study using the above applicable concepts.

BIV-21
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER
CORE: CYBER SECURITY

Objective of the subject: This paper helps the students to understand the different types of Threats, Cyber Crimes, Cyber Risks and also discusses on the necessity of Threat Intelligence for a better Cyber Management and supportive Architecture.

UNIT I: (10 Hrs)

Cyber Threats: Cyber Security and its importance-Cyber Threats -Organized Crime - Proliferation of Weapons of Mass Destruction- Background, Sources and Types of Cyber Threats- Potential Risk factors of Cyber Threats- Implications of Cyber Threats on high targeted Industries- **Cyber Crime:** Overview-Origin and evolution of Cyber Crime-Criminalization-Cyber Crime Classifications-Conducting Cyber Investigations-Economical crisis - Challenges faced in Cyber Crimes-Cyber Crime Legislations.

UNIT II: (8 Hrs)

Cyber Threat Intelligence- An Overview of Threat Intelligence- Key Characteristics- Need for Threat Intelligence- Impact of Threat Intelligence-Applicability of Threat Intelligence. Threat Detection Rules -Risk Reduction through Threat Intelligence – Understanding and Implementing Threat Intelligence.

UNIT III: (11 Hrs)

Cyber Management -Cyber Risk- Analyzing and Managing Cyber Risks- Consequences of Cyber Crimes - Risk Management Principles: Principles of Risk Management-Risk Management Process- Dealing with Risks- Risk Analysis - Evaluating cyber risks: Assessing the IT security- Quantifying the Risks-Evaluation of the existing Insurance Policies-Improve security and overall Risk Strategy- **Prepare your organization- Coverage Review-** Benefits of Risk Management- Cyber Risk Management Frameworks-Governance of Cyber Security Risks.

UNIT IV: (11 Hrs)

Cyber Security Challenges –Fundamentals-Evolution-Strategic Cyber Security- Cyber Security Policies-Preventing Cyber Attacks-Methods of Securing Next Generation Internet Services. **Cyber Security Architecture-** Planning, Design and Implementation Issues of Security Architecture- Implementation Issues of the Security Architecture- Global Architectural Approach- Multifaceted Cyber Security.

UNIT V: (10 Hrs)

Cyber Defense Mechanisms- Cyber Self Defense- Cyber Attack Techniques and Defense Mechanisms- Cyber Defense Planning Model- Cyber Supply Chain Security- DDOS Attacks and Cyber Defense: Securing Industrial Control Systems - Case Studies on Cyber Crime in Indian Perspective.

TEXT BOOK

1. Combating Cyber Threats through Cyber Security Intelligence, Dr.S.Sujatha, Dr.N.Sudha Bhuvanewari, Kalaikathir Publications, 2017.

BIV-22

2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

CORE: JAVA PROGRAMMING

Objective of the subject: This paper aims to learn the Java programming language along with its syntax, idioms, patterns, and styles. To understand object oriented programming and to learn the essentials of the Java class library and event driven Graphical User Interface (GUI) programming. OOPS, branching statements, classes, constructor, and inheritance, static classes, abstract classes, packages, string handling, multithreading and applets.

UNIT I

(9 Hrs)

Java Programming Techniques – Lexical issues – Variables – Types – Arrays – Operators. Branching: If-else, break, switch, return statements – Looping: while, do-while, for, comma statements, continue.

UNIT II

(9 Hrs)

Classes: Object references – Instance Variables – New operator- Dot operator – Method declaration – Method calling – this operator – Constructors – Method overloading – Inheritance – Super class – Method overriding – Dynamic method dispatch – final, finalize, static, Abstract classes.

UNIT III

(10 Hrs)

Packages and Interfaces: Packages: The package statement – Compiling classes in packages - The import statement – Access protection. Interface: The interface statement – The implements statement – Variables in interfaces.

String handling: Constructors – String creation – String Concatenation – Character Extraction, Comparison.

UNIT IV

(12 Hrs)

Exception handling fundamentals: Exception type – Uncaught Exceptions – Nested try statements – The Java thread model – Thread Priorities, Synchronization, Messaging – Thread – Runnable – Inter Thread communication – Thread API Summary. File Handling – - java.io package - I/O Stream classes.

UNIT V

(10 Hrs)

Applets: HTML applet tags – Order of Applet initialization – Sizing graphics – Simple graphics – Color methods – Fonts – Multi-line Text Alignment – Abstract Window Toolkit: Components – Layout – Menu Components – Event.

TEXT BOOK

1. **The Java Handbook**, Patrick Naughton, Tata McGraw Hill, 2008.
2. **Java 9 for Programmers**, Paul J.Deitel, Harvey Deitel, Prentice Hall, 4th Ed, 2017.

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BT-23

2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

CORE: OPERATING SYSTEMS

Objective of the Subject: The objective is to emphasize the need and the functionality of the operating system, to discuss the components and responsibilities of the operating systems like storage management, process management and device management. The implementation of these concepts in DOS operating system are also discussed.

UNIT I:

(10 Hrs)

Introduction and process concepts: Definition of OS - Definition of process – Process states, lifecycle of process – process management

Asynchronous Concurrent Execution: Mutual Exclusion – Implementing Mutual Exclusion Primitives – software solution to the Mutual Exclusion Problem- Semaphores

UNIT II:

(10 Hrs)

Deadlock and Indefinite Postponement: Introduction – Examples – Related Problem – Resource concepts – Four Necessary conditions for Deadlock – Deadlock solutions – deadlock prevention – deadlock avoidance – detection –recovery – deadlock strategy in current and future systems.

UNIT III:

(10 Hrs)

Processor Scheduling: Preemptive Vs Nonpreemptive scheduling –priorities - Scheduling objectives – scheduling criteria - Scheduling algorithms – deadline scheduling

UNIT IV:

(10 Hrs)

Real Memory Organization and Management: Introduction – Memory Organization – Memory Management – Hierarchy – Memory Management Strategies – Contiguous Vs Non contiguous memory allocation – Single user contiguous memory allocation – Fixed partition multiprogramming – variable partition multiprogramming – Paging

UNIT V:

(10 Hrs)

Virtual Memory Management: Demand Paging –anticipatory paging - Page Replacement – page replacement strategies – page fault – page size

Disk performance Optimization – Necessity of Disk Scheduling – Disk Scheduling Strategies – A Case study on a Mobile Operating System.

TEXT BOOKS

- 1. Operating System**, Deital Deital Choffnes, Pearson Education, First Edition, 2009.
- 2. An Introduction to Operating System**, H.M.Deital, Addison Wesley, Second Edition, reprint 2006.
- 3. Modern Operating Systems:** Global Edition, Andrew S Tanenbaum, Herbert Bos , Pearson Publishers, 4th Ed, 2015.

BIV-24
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER
CORE: SOFTWARE ENGINEERING

Objective of the subject: This subject mainly concentrates on software engineering concepts along with some of the methodologies of Testing. This paper highlights on the characteristics of software, software evolution, software models, the various phases in software design and user interface design, different types of software testing techniques.

UNIT I

(8 Hrs)

Introduction to software engineering: The Evolving Role of software. Software. The changing nature of software. Legacy software. A Generic view of software: Software Engineering-A Layered Technology. A Process Framework. The Capability Maturity Model Integration (CMMI). Process Partners. Process Assignment. Personal and Team Process Models. Process Technology.

UNIT II

(12 Hrs)

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

UNIT III

(10 Hrs)

An Agile View of Process: Agility. Agile Process. Agile Process Models. Software Engineering Practice. Communication Practices. Planning Practices. Modeling Practices.

UNIT IV

(10 Hrs)

System Engineering: Computer Based Systems. The System Engineering Hierarchy. Business Process Engineering: An Overview. Product engineering: An Overview. Requirements Engineering: A Bridge to Design and Construction. Requirements Engineering Tasks. Initiating the Requirements Engineering Process. Building the Analysis Model. Negotiating Requirements. Validating Requirements.

UNIT V

(10 Hrs)

Estimation: Observations and Estimation. Resources. Software Project Estimation. Empirical Estimation Models. Risk Management: Reactive vs. Proactive Risk Strategies. Software Risks. Risk Identification. Risk Projection. Risk Refinement.

Note: Case Study of a latest Project can be added.

TEXT BOOKS

1. Software Engineering –A Practitioner's Approach. Roger S. Pressman, Tata McGraw-Hall Edition. Tenth Edition, 2013.
2. Ian Sommerville, Pearson Education, Ninth Edition, 2011.

BIV-25
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER
ELECTIVE I: AUGMENTED REALITY

Objective of the Subject: This paper sets the stage by presenting a working definition of augmented reality, providing various application examples of this powerful real world user interface technology.

Unit I: (10 Hrs)
Introduction to Augmented reality – Definition and scope – A brief history of Augmented Reality – Examples- Related fields

Unit II: (10 Hrs)
Displays – Multimodal Displays – Visual Perception – Requirements and Characteristics – Method of Augmentation – Ocularity and Stereoscopy - Focus – Occlusion.

Unit III: (10 Hrs)
Tracking, Calibration and Registration – Coordinate Systems – Characteristics of Tracking Technology – Mobile sensors – Optical tracking.

Unit IV: (10 Hrs)
Computer vision for Augmented Reality: Marker Tracking – Multiple camera Infrared Tracking – Incremental tracking – Simultaneous Localization and Mapping – Outdoor tracking

Unit V: (10 Hrs)
Calibration and Registration: Camera Calibration – Display Calibration – Registration – Situated Visualization – Challenges – Visualization Registration – Annotations and Labeling – X – Ray Visualization.

TEXT BOOKS:
1. **Augmented Reality Principles and Practice**, Dieter Schmalstieg, Tobias Hollerer, Addison Wesley, 2016.

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER
ELECTIVE I: BIG DATA ANALYTICS

Objective of the Subject: This paper gives an overview about Big data and introduces the technology behind it. The paper also concentrates on the recent technologies available in the market dealing with big data. The case study covered in the syllabus gives students an awareness and better understanding about big data.

UNIT-I

(10 Hrs)

Introduction to Big Data-Characteristics of Big Data- The volume of Data- the Variety- the Velocity of Data- Data in the Warehouse and Data in Hadoop.
Importance of Big Data – When to consider a Big Data Solution- Big Data Use cases: Patterns for Big Data Deployment- IT for IT Log Analytics.

UNIT-II

(10 Hrs)

Big Data: From the Technology Perspective-All about Hadoop: The Big Data Lingo
Chapter- The history of Hadoop- Components of Hadoop- Application Development in Hadoop-Getting your data into Hadoop- Other Hadoop Components.

UNIT- III

(10 Hrs)

Hadoop- Integrated Hadoop System- Analytical Databases with Hadoop Connectivity- Hadoop-Centered Companies. Big Data in the Cloud: IaaS And Private Clouds-Platform Solutions-Big Data Cloud platforms compared.

UNIT-IV

(10 Hrs)

The NoSQL Movement: Size, Response, Availability-Changing Data and Cheap Launches- The sacred Cows-other features. The Future of Big Data: More Powerful and expressive tools for Analysis- Streaming Data Processing- Rise of Data Marketplaces- Development of Data Science Workflows and Tools- Increased Understanding of and Demand for Visualization.

UNIT- V

(10 Hrs)

Big Data Analytics in Banking Sector, Manufacturing, Telecommunication and E-commerce.

TEXT BOOKS

1. **Understanding Big Data, Analytics for Enterprise Class Hadoop and Streaming Data**, Chris Eaton, Dirk Deroos, Tom Deutsch, George Lapis, Paul Zikopoulos, Tata Mc Graw Hill, 2012 Edition. (ebook) (Unit-I and II) (Refer e-book repository)
2. **Planning for Big Data**, O'Reilly Radar Team, 2012.(ebook) (Unit III and IV) (Refer e-book repository)

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER
ELECTIVE I: OPEN SOURCE SOFTWARE

Objective of the subject: This paper focuses on open source systems. It also orients developing application with an open source scripting application like PHP in the front end and an open source backend like MySQL.

UNIT I**(8 Hrs)**

Open Source – Definition of Terms – Open Source Operating systems – Contents – Linux distribution – Open Source Desktop applications – Introduction – Graphical Desktops – Web browsers – The Open Office Suite.

UNIT II**(8 Hrs)**

MySQL Data types – Working with Database and Tables: Creating Databases, Selecting Database for use – Deleting Databases – Creating Tables – Copying Tables – Modifying Tables – Deleting Tables. Working with Data: Inserting, updating and deleting records – Retrieving records – Copying, Importing and Exporting records – Subqueries.

UNIT III**(12 Hrs)**

PHP- Overview- Writing PHP Programs: Example program-Viewing a web page-Serverside scripting-caching-variables-Getting Data from the Client: Web forms-Decision making: Conditional or Branching statements- Form Validation- Loops and Arrays.

UNIT IV**(10 Hrs)**

Organising codes: Code reuse- Functions- Scope of functions-Nesting-Include files. Objects : File and directory Handling: Working with files –Working with directories- uploading files.

UNIT V**(12 Hrs)**

Retrieving data from MySQL using PHP: Retrieving data using PHP- SQL statements fro Retrieving data. Manipulating Data in MySQL using PHP: Update- delete records- Date and Time Type fields- Getting information on database tables. PHP Database Connectivity: PHP MySQL Connectivity

TEXT BOOKS

1. **Open Source Software**, Paul Kavanagh, Elsevier Digital Press, 2004, 1st Edition. (Unit I)
2. **MySQL: The Complete Reference**, Vikram Vaswani, Tata McGraw Hill, 2004. (Unit II)
3. **Beginning PHP4**, Wankyu Choi, Allan Kent, Chris Lea, Ganesh Prasad, Chris Ullman with Jon Blank, Sean Cazzell, Shroff Publishers and Distributors Pvt.Ltd, 2000.(Unit III, IV, V)

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

ELECTIVE I: COMPUTER GRAPHICS AND MULTIMEDIA

Objective of the Subject: The objective is to provide information about Video Display devices, 2-D and 3-D Geometric transformations, Graphical Input Devices, Color Models and Color Applications and algorithms such as Line, Circle and Clipping.

UNIT I:

(10 Hrs)

Basic Concepts: Introduction – Uses of Computer Graphics – The Origins of Computer Graphics- How the Interactive Graphics Display Works. Video Display Devices - Refresh CRT- Raster Scan Displays- Random Scan Displays- Color CRT monitors – Direct View storage Tubes – Flat Panel Displays – Three-dimensional Viewing Devices

UNIT II:

(10 Hrs)

Output Primitives: Points and Lines – Line Drawing Algorithms: DDA Algorithm, Bresenham's Line Algorithm, Parallel Line Algorithms – Circle Generating Algorithms: Properties of Circles, Midpoint Circle Algorithm, DDA Circle Algorithm

UNIT III:

(12 Hrs)

Two Dimensional Transformations: Basic Transformation - Matrix Transformation and Homogeneous Co-Ordinates - Composite Transformations - Other Transformations - Windowing and Clipping: The Viewing Pipeline, Viewing Coordinate Reference Frame, Window- to- view port Coordinate Transformation. Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping

UNIT IV:

(10 Hrs)

Graphical Input Devices – Hard Copy Devices - Color Model and Applications: Properties of light – Standard primaries and the chromaticity diagram – XYZ color model – CIE chromaticity diagram- Intuitive color concepts: RGB – YIQ - HSV – HLS – CMY color models

UNIT V:

(8 Hrs)

Three-dimensional concepts: Three-dimensional transformation –Translation, rotation, scaling – Other Transformations. Three-dimensional viewing: – Viewing pipeline – Viewing coordinates – Projections – Parallel Projections – Perspective Projections

TEXT BOOKS

1. **Computer Graphics C Version**, Donald Hearn, M Pauline Baker, Pearson Education, 2011.
2. **Principles of Interactive Computer Graphics**, William M. Newman, Robert F. Sproull, Tata McGraw Hill, 2nd edition, 2010.

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BIV-29
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

ELECTIVE I: EMBEDDED SYSTEM AND ITS APPLICATIONS

Objective: This paper introduces basic electronics, highlights on microcontrollers and embedded systems, robotics and its applications.

UNIT I (10 HRS)
Basic Electronics: Components and Devices: Capacitors – Resistors – Transistors – Diodes – LEDs - Breadboard – AC Motors – DC Motors - Servo Motors - Measuring Instruments – Circuits – Power Units

UNIT II (10 HRS)
Introduction to Microcontrollers and Embedded Systems: Introduction to PCB – Microprocessors Vs Microcontrollers – Types of Microcontrollers, Advanced Microcontroller Chips: ATmega, Atmel - Arduino IDE

UNIT III (10 HRS)
Fundamentals of Sensors – Types - functional characteristics of sensors – IR Sensors – Temperature Sensors – Light Sensors - Actuators – Sensors and actuators for Biosciences – Tactile Sensors – Strain gauges - UAV flight control system, Applications of Embedded systems in Air surveillance.

UNIT IV (10 HRS)
Introduction to Robots – Types of Robots – Operating Principles and functions – Black Line follower robot – Edge detector robot – Obstacle sensing – Automation of Traffic signals.

UNIT V (10 HRS)
Applications: Robotics applications in Agriculture, Biotechnology, Information and Communication Technology, Navigation.

Reference Books

1. V.K.Mehta, "Basic Electronics", S Chand & Co,
2. Arduino Tutorial: <http://www.ladyada.net/learn/arduino/>

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

ELECTIVE I: SOFTWARE TESTING

Objective of the subject: This paper highlights on the introduction of software testing and its need. Different types of testing such as white box testing, Black box testing, Integration testing, System and Acceptance Testing, Performance testing and Regressing Testing are also covered.

UNIT I

(10 Hrs)

Testing fundamentals: Introduction-Basic definition-Software testing principles- Tester's role. Defect, Hypotheses and Test: Origins of defects- Defects classes, repository and Test design.

UNIT II

(10 Hrs)

White Box Testing: Introduction- Static testing- Structural Testing- Challenges. Black Box Testing: Introduction-Need –Time for doing black box testing.

UNIT III

(10 Hrs)

Integration Testing: Integration Testing as a type of testing-As a phase of testing. System and Acceptance Testing: System testing overview- Need for system testing- Functional and Non functional testing.

UNIT IV

(10 Hrs)

Performance testing: Factors- Methodology-Tools-Process. Regressing Testing: Types- Time to do Regressing Testing- Methodology of Regressing Testing.

UNIT V

(10 Hrs)

Test Planning, Management, Execution and Reporting: Test planning- Test management-Test process- Test Reporting. Case study: Selenium IDE.

TEXT BOOKS

1. **Practical Software Testing**, Ilene Burnstein, Springer Publication, 13th Indian reprint, 2013. (Unit I).
2. **Software Testing Principles and Practices**, Srinivasan Desikan and Gopalaswamy Ramesh, Pearson Publication , Reprint 2011 (Unit II – Unit V)
3. **A Practitioners Guide to Test Automation using Selenium**, Aditya Garg, Ashish Misra, Tata McGraw Hill Publications, 2015 (Unit V)



BIV - 31
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

ELECTIVE I: AIR AND SEA NAVIGATION

Objective of the Subject: This course is designed to introduce the computing technologies used for Air and Sea Navigation. The fundamentals, key terms and equipments used for the navigations purposes are discussed.

UNIT I:

(10 Hrs)

Air Navigation: Navigation Aids – Distance Measuring Equipments (DME) – LORAN - Doppler RADAR – GPS. Aeronautical lighting and other Airport Visual Aids: Approach Light Systems – Runway Edge Light Systems – Control of Lighting Systems - Air Space: General Dimensions of Airspace Segments – Air Traffic Control: Air Route Traffic Control Centers – Control Towers.

UNIT II:

(10 Hrs)

Emergency Procedures: Pilot Responsibility and Authority – Emergency Condition: – Safety of Flight: Weather Observing Program – Medical Facts for Pilots: Fitness for flight – Vision in flight – Helicopter Operations: Helicopter Flight control systems.

UNIT III:

(10 Hrs)

Fundamentals: Introduction to Marine Navigation – Nautical Charts: Chart fundamentals – Piloting: Definition and Purpose - Preparation – Transition to Piloting - Short Range aids to Navigation: Fixed Lights – Light Characteristics – Buoyage Systems – Compasses – Magnetism Compasses - Tides and Tidal Currents: Origins of Tides – Features of Tides

UNIT IV:

(10 Hrs)

Satellite Navigation: The Global Position System – LORAN Navigation: Introduction to LORAN – LORAN Description – RADAR Navigation: Principles of RADAR operations. Navigational Astronomy: The Universe – AZIMUTHS and AMPLITUDES.

UNIT V:

(10 Hrs)

Emergency Navigations: Basic Techniques - Navigation Regulations: Ship Routing – Maritime Safety Systems Global Maritime Distress and Safety System – Hydrography: Basics of Hydrographic Surveying. Weather Elements: General Description of the Atmosphere.

TEXT BOOKS

1. NATHANIEL BOWDITCH, LL.D, “The American Practical Navigator : The Epitome of Navigation”, The National Imagery and Mapping Agency, 2002.
2. Jim Doherty, “Maritime Navigation”, Trieste, Italy, 2010(Online Tutorial)
3. Professor Dr. Paul Stephen Dempsey, Director, Institute of Air & Space. “Air Navigation”, McGill University, www.iasl.mcgill.ca (online Tutorial)
4. Aeronautical Information Manual, Official Guide to Basic Flight Information and ATC Procedures, US Department of Transportation, Federal Aviation Administration, 2017.

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BIY-32
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER
ELECTIVE I: SCRIPTING LANGUAGES

Objective of the Subject: This subject introduces the different scripting languages for developing client side web based application. This course covers Java Script, VB Script, PHP Script and PERL Script.

UNIT I

(10 Hrs)

JavaScript : Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type – Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box.

UNIT II

(10 Hrs)

JavaScript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.

UNIT III

(10 Hrs)

VBScript: Introduction to VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants - VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions –date functions – string functions.

UNIT IV

(10 Hrs)

PHP: Server side scripting Language: Basic syntax - Types - Variables - Constants - Expressions - Operators - Control Structures - Functions - Classes and Objects - HTML forms - HTTP authentication with PHP - Cookies - Handling file uploads - Using remote files - Connection handling - Database Connections.

UNIT V

(10 Hrs)

Perl: Introduction to Perl Scripting, working with Simple Values, Lists and Hashes, Loops and Decisions, Regular Expressions, Files and Data in Perl Scripting.

TEXT BOOKS

1. Thomas A Powel, Fritz Schneider, “JavaScript: The Complete Reference”, Third Edition, Tata McGraw Hill, 2013.
2. Douglas Crockford, “JavaScript: Good Parts”, Yahoo Press and Oreilly Media, 1st edition, 2008.
3. Hathleen Kalata, Internet Programming with VBScript and JavaScript, Thomson Learning.
4. Steven Holzner, PHP: The Complete Reference, Tata McGraw Hill Edition 2008.
5. Simon Cozens, Beginning Perl, Wrox Press Ltd, 2000.

BIV - 33
2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

CORE: JAVA PROGRAMMING LAB

Objective of the Subject: The main objective is to develop Java programming in an Open Source Platform. This paper provides a hands-on experience in developing websites, basic OOPS concepts, applets, packages, multi-threading, exceptions, interface.

Develop a Java Program for the following concepts:

1. Classes and objects.
2. Arrays.
3. Thread.
4. Exception handling.
5. Inheritance.
6. Interfaces
7. User defined Packages
8. String Operations
9. Applets.
10. File Handling – I/O Stream Classes
11. AWT Controls & Event handling

Note:

Develop a project / case study using the above applicable concepts.

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

FIFTH SEMESTER

SKILL BASED SUBJECT: APTITUDE

Objective of the subject: This subject highlights on improving the aptitude ability of the student and to understand technical and logical work outs like ratio and proportion, C Programming, OOPS concepts, Sequence and Series and Probability.

UNIT I: (6 Hrs)

Ratio and proportion - Indices – Logarithms. Sequence and Series – Arithmetic and geometric progressions. Algebra – Average

UNIT II: (6 Hrs)

Problems on Ages – Clocks & Calendars – Mixtures & Alligations – Time & Work – Time & Distance – Profit & Loss

UNIT III: (6 Hrs)

Statistical description of data - Textual, Tabular & Diagrammatic representation of data – Data Sufficiency – Probability and Expected Value by Mathematical Expectation

UNIT IV: (6 Hrs)

C Programming – Fundamental concepts – Data types – Functions - Structure and Union – Pointers – Exception handling - problem solving in C

UNIT V: (6 Hrs)

Object Oriented C++ - Classes – Objects – Object oriented Paradigms: Data Abstraction - Encapsulation – Inheritance – Polymorphism – Abstract Classes – Virtual classes

TEXT BOOKS

1. **Quantitative Aptitude**, R.S.Aggarwal, S. Chand & Company Ltd, 2010.
2. **Quick Arithmetic**, Ashish Aggarwal, S. Chand & Company Ltd, 2007.
3. **C Programming with Problem solving**, Jones, Jacqueline, Dreamtech Publishers, 2006.
4. **Let us C++**, Kanetkar, Yashavant P, BPB Publications, 2010.

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

CORE: COMPUTER NETWORKS

Objective of the subject: This paper focuses on the reference models, issues of different layers of the OSI reference model layers and underwater networking concepts. This subject helps in understanding the concepts of **Computer Network Engineering and Underwater Networks**.

UNIT I:

(10 Hrs)

Introduction: Use of computer networks – Network Hardware – PAN, LAN, MAN WAN, Internetworks – Network software- Protocol hierarchies – Design issues for the layers – Connection-Oriented versus Connectionless Service – Service Primitives – Reference models - the OSI reference model – the TCP/IP reference model. Types of networks: Wireless and mobile networks.

Network Ports: Connectors – Switch – Jack. Switching systems: Circuit switching – message switching – Packet switching- Network Boosters. Critical areas of the Network: Security – Traffic Management – Real-Time monitoring – Scalability

UNIT II:

(10 Hrs)

The Physical Layer: Transmission Media – Wireless transmission – Communication satellites. Data link layer: Data link layer design issues – Error detection and correction – Elementary data link protocols – Sliding window protocols.

UNIT III:

(10 Hrs)

Network Layer: Network layer design issues - Routing algorithms – The optimality principle – Shortest path routing – Flooding – Distance vector routing. Transport layer: The transport service – Elements of transport protocol. Application Layer: Domain Name System – The DNS Name space – Domain resource records – Name servers- The world wide web.

UNIT IV:

(10 Hrs)

Introduction: Underwater Networking – Underwater Networking Architecture - Types of Cables - Modems - Protocols - Operating System - Monitoring systems. Network monitoring: deployment – relocation - recovery

UNIT V:

(10 Hrs)

Applications of Underwater Networking: Autonomous underwater vehicles (AUVs) – Sea level temperature - Storm identification – Heading - storm's intensity, hail probabilities – Hail Size - causes of a Tsunami – timing and intensity – centre of the Tsunami - direction.

TEXT BOOKS:

1. Computer Networks, Andrew S. Tanenbaum & David J. Wetherall, Pearson Education, 2012, 5th Edition.
2. Data and Computer Communications, William Stallings, Prentice Hall of India, 2007, 8th Edition.
3. Robert J. Urick, Principles of Underwater Sound, Peninsula Publication, Third Edition, 1996
4. Ask T., Handbook of Marine Surveying, Sheridan House, 2007.
5. Web References

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

CORE: WEB TECHNOLOGY

Objective of the subject: This paper includes basics of .NET Framework, developing & deploying ASP.NET applications, Web controls, Web site navigation and Data binding.

UNIT I:

(10 Hrs)

Introducing the .NET Framework: The Evolution of Web Development – The .NET Framework - .NET Languages – The Common Language Runtime - .NET Class Library. Developing ASP.NET Applications – Visual Studio: Creating Websites- Designing a Web page- The anatomy of a Web Form – Writing Code – Visual Studio Debugging. Web Form Fundamentals: The anatomy of an ASP.NET Application – Introducing Server Controls – HTML Control Classes – The Page Class – Application Events – ASP.NET Configuration.

UNIT II:

(10 Hrs)

Web Controls: Stepping Up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple Web page. State Management: The problem of State – View State – Transferring Information between Pages – Cookies – Session State – Session State Configuration – Application State – An Overview of State Management Choices.

UNIT III:

(10 Hrs)

Building Better Web Forms - Validation: Understanding Validation – The Validation Controls. Rich Controls: The Calendar – The AdRotator – Pages with Multiple Views. User Controls and Graphics: User Controls – Dynamic Graphics.

UNIT IV:

(10 Hrs)

Website Navigation: Site Maps – The SiteMapPath Control – The Tree View Control – The Menu Control. ADO.NET Fundamentals: Understanding Databases – Configuring Your Database – SQL Basics –The DataProvider Model – Direct Data Access – Disconnected Data Access.

Putting MVC into ASP .NET Context – Your First MVC Application –Essential Tools for MVC.

UNIT V:

(10 Hrs)

Data Binding: Introducing Data Binding – Single-Value Data Binding – Repeated-Value Data Binding – Data Source Controls. The Data Controls : The GridView – Formatting the GridView – Selecting a GridView Row – Editing with the GridView – Sorting and Paging the GridView – Using GridView Templates – The DetailsView and FormView.

TEXT BOOKS:

1. **Beginning ASP.NET 4 in VB 2010**, Matthew MacDonald, Apress, Berkeley, CA, USA, 2010.
2. **Pro ASP. NET MVC 5**, Adam Freeman, Apress, Fifth Edition, 2013.
3. **Programming WCF Services**, Juval Lowy and Michael Montgomery, O'Reilly Publications, 4th Edition, 2015

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

CORE: WEB TECHNOLOGY LAB

Objective of the subject: The lab sessions includes creation of web pages using ASP.NET, manipulation with web controls and multiple format display using ADO.NET.

1. Creation of ASP.NET Web Page.
2. Creating and manipulation with Web Controls.
3. Create and manipulate with Rich Web Controls (Ad rotator).
4. Create and manipulate with Rich Web Controls (Calendar).
5. Create and manipulate with Rich Web Controls (Treeview).
6. Creation and manipulation of User Controls.
7. Connecting to database with GridView control.
8. Database manipulation using GridView control.
9. Displaying the data in GridView control with sorting and paging.
10. An MVC application.

Note

Develop a project / case study using the above applicable concepts.

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Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

ELECTIVE II: MOBILE PROGRAMMING

Objective of the Subject: To introduce the mobile communication fundamentals and to enable the students for writing android based script for mobile application development. It also provides eclipsed based IDE programming for the mobile environment.

UNIT I: (10 Hrs)

Introduction - History of Wireless communication-Applications - Market for Mobile communications - Characteristics of Wireless Technologies - Cellular System infrastructure - A simplified reference model. Medium access control – Motivation for a specialized MAC-SDMA-FDMA-TDMA-CDMA

UNIT II: (10 Hrs)

Telecommunication systems – GSM - Mobile services - System architecture - Radio interface – Protocols - Localization and calling – Handover – Security - new data services – DECT - System architecture -. Satellite systems – Applications – Basics – GEO – LEO – MEO

UNIT III: (10 Hrs)

Getting Started with Android Programming : Android - Versions - Features of Android - Architecture of Android -Android Devices in the Market -The Android Market -Obtaining the Required Tools -Android Studio -Android SDK -Creating Android Virtual Devices (AVDs) - The Android Developer Community -Launching Your First Android Application

UNIT IV: (11 Hrs)

Using Android Studio for Android Development : Exploring the IDE -Using Code Completion -Debugging Your Application -Setting Breakpoints -Navigating Paused Code - Publishing Your Application -Generating a Signed APK.

UNIT V: (9 Hrs)

Activities, Fragments and Intents: Understanding Activities -Applying Styles and Themes to an Activity - Hiding the Activity Title - Displaying a Dialog Window -Displaying a Progress Dialog - Linking Activities Using Intents -Returning Results from an Intent -Passing Data Using an Intent Object -Fragments -Adding Fragments Dynamically -Life Cycle of a Fragment -Interactions Between Fragments

TEXT BOOKS

1. J. Schiller, Mobile Communications Addison Wesley, 2011.
2. Di Marzio J F, Beginning Android Programming with Android Studio, Wiley India Pvt. Ltd

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Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

ELECTIVE II: CLOUD COMPUTING

Objective of the subject: The paper introduces cloud computing and makes students familiar with the concept of Cloud Computing. The paper includes the core issues of cloud computing, infra structure and virtualization.

UNIT I

(10 Hrs)

First Drive: Introduction – Essentials – Benefits - Types of cloud - Need for Cloud - Business and IT perspective - Cloud and Virtualization - Cloud Services Requirements - Cloud and Dynamic Infrastructure - Cloud Computing Characteristics - Cloud Adoption-Cloud Rudiments. Cloud Deployment Models – Introduction - Cloud Characteristics - Measures Service - Cloud Deployment Models - Security in Public Cloud - Public versus Private Cloud - Cloud Infrastructure Self-Service.

UNIT-II:

(10 Hrs)

Cloud as a service: Introduction - Gamut of Cloud Solutions - Principal Technologies - Cloud Strategy- Cloud Design and Implementation Using SOA - Conceptual Cloud - Cloud Service Defined. Cloud Solutions: Introduction-Cloud Eco system - Cloud Business Process Management - Cloud Service Management – On - Premise Cloud Orchestration and Provisioning Engine - Computing on Demand(CoD) - Cloud sourcing.

UNIT-III

(10 Hrs)

Cloud offerings: Introduction - Information storage, Retrieval, Archive and Protection - Cloud Analytics - Testing Under cloud - Information Security - Virtual Desktop Infrastructure - Storage Cloud. Cloud Management: Introduction: Resiliency - Provisioning-Asset Management - Cloud Management - High availability and disaster recovery - Charging Models, Usage Reporting, Billing and Metering.

UNIT-IV

(10 Hrs)

Cloud virtualization technology - Virtualization defined - Virtualization Benefits - Server Virtualization - Virtualization for x86 Architecture - Hypervisor Management Software - Virtual Infrastructure Requirements.

UNIT-V

(10 Hrs)

Cloud Infrastructure: Introduction-Storage Virtualization - Storage Area Networks - Network Attached Storage - Cloud Server Virtualization - Networking Essential to Cloud.

TEXT BOOK

1. **Cloud Computing**, Dr.Kumar Saurabh, Wiley India, 2nd Edition, Reprint 2012.

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Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

ELECTIVE II: INTRODUCTION TO INTERNET OF THINGS

Objective of the subject: This subject highlights on physical design, logic design, enabling technologies of IoT, IoT system management and design methodology, IoT physical devices and cloud offerings.

UNIT I:

(10 Hrs)

Introduction to Internet of things: Introduction- Definition and Characteristics - Physical design of IOT-Logical design of IOT

UNIT II:

(10 Hrs)

IOT Enabling Technologies-IOT Levels and Deployment templates – Domain Specific IOTs – Home Automation – Smart Cities – Agriculture.

UNIT III:

(10 Hrs)

IOT Platforms Design Methodology – Purpose and Requirements Specification – Process Specification – Domain Model Specification – Information Model Specification – Service Specification – IoT Level Specification- Case Study on IoT System for Weather Monitoring.

UNIT IV:

(10 Hrs)

IOT physical devices and Endpoints – IoT Device –Exemplary Device: Rasperry Pi – About the Board- Linux on Raspberry Pi - Raspberry Pi Interfaces – Serial – SPI – I2C.

UNIT V:

(10 Hrs)

Case Studies illustrating IoT Design: Home Automation: Smart lighting- Cities : Smart Parking-Environment: Air pollution monitoring-Productivity application: IoT Printer.

TEXT BOOK:

1. Arshdeep Bahga ,Vijay Madiseti, Internet Of Things-A hands on approach, -2014.

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Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

ELECTIVE II: SOFTWARE QUALITY AND ASSURANCE

Objective of the subject: This paper provides a rich focus on the industry experience of software quality. It covers the different dimensions of quality assurance for academics and industry.

UNIT I

(10 Hrs)

Introduction to Quality: Introduction – History of Quality Assurance – Quality in the current business scenario – models and frameworks of quality – software industry – an engine to the future – quality an overview. Software Process- Models and Frameworks: Contributors to software quality – models affecting software quality – software development process models – quality standards and guidelines – software process capability Improvement models

UNIT II

(10 Hrs)

Software Process-Detailed View: Need of software process - Process structure and definition – process classification – process frameworks – process automation – process validation and improvement. Software Metrics: Art and Science of software projects – measures and metrics – metrics across the project lifecycle – metrics establishment program – information flow in software projects – metrics presentation for decision making-metrics management challenges

UNIT III

(10 Hrs)

Quality and Project management: Project-meaning and scope – project management process – project and organization: the quality link – project variables – Learning and sharing – managing the project risk

UNIT IV

(10 Hrs)

The components of the software quality assurance system-overview: The SQA system - an SQA architecture – Pre-Project components – software project life cycle components – Infrastructure components for error prevention and improvement – Development and quality plans: Objectives – Elements – development plan and quality plan.

UNIT V

(10 Hrs)

Integrating quality activities in the project life cycle – Reviews – Assuring the quality of software maintenance components – Assuring the quality of external participants contributions – CASE tools and their effect on software quality – Software quality Infrastructure components.

TEXT BOOKS

1. **Software Quality: A Practitioner's Approach**, Kamma Malik, Praveen Choudhary, Tata McGraw Hill, Second Reprint 2011.
1. **Software Quality Assurance From theory to Implementation**, Daniel Galin, Pearson, 2004

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

ELECTIVE II : ENTERPRISE RESOURCE PLANNING

Objective of the subject: This paper highlights on the introduction of ERP and its benefits. An overview about Business Engineering and Business Modeling is discussed. Method of ERP implementation and Vendors are given.

UNIT I

(10 Hrs)

ERP Curtain Riser: Accommodating variety-Integrated Management Information-Seam less Integration- SCM-Resource management-Data model-Scope-Technology-Benefits-Evolution-Revisited-Modern Enterprise. Business Engineering: Overview-Significance-Principles-IT- Concerns.

UNIT II

(10 Hrs)

Business Modeling: Building the model- Problems. ERP Implementation: Roles-Customization-Precautions-Post implementation- Implementation method. Competitive Advantage.

UNIT III

(10 Hrs)

ERP Domain: MFG/PRO- IFS/Avalon-Bann IV-SAP 82- SDAP R/3 Applications- Indian ERP Package- Arrival of ERP III- problems.

UNIT IV

(10 Hrs)

Marketing Of ERP: Overview-Market Dynamics and Competitive Strategy- Managing strategy process-Relationship marketing- Developing strategies- Planning Programmes- Participants-Sales cycle.

UNIT V

(10 Hrs)

Case Study: Benz-Keen Hin Industries-Bull Electronics- Twentieth Century Companies- Ameritech-Essar steel- Jindal Iron-Godrej Soaps-IREDA-Sara Case Study

TEXT BOOK

1. **Enterprise Resource Planning Concepts and Practice**, Vinod Kumar Garg and N.K. Venkitakrishnan, PHI Publication, 2nd Edition, 22nd Reprint 2012. (Unit I-V).

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Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

ELECTIVE II: INTELLECTUAL PROPERTY RIGHTS

Objective of the subject: This course introduces the fundamentals of Intellectual Property rights, Law of copy rights, patents and trade secrets.

UNIT - I: (10 Hrs)

Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT - II: (10 Hrs)

Trade Marks: Purpose and function of trade marks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT - III: (10 Hrs)

Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law. **Law of patents:** Foundation of patent law, patent searching process, ownership rights and transfer

UNIT - IV: (10 Hrs)

Trade Secrets: Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secret litigation. **Unfair competition:** Misappropriation right of publicity, False advertising.

UNIT - V: (10 Hrs)

Plagiarism – Plagiarism occurrence – positive reasons for not plagiarizing – Plagiarism in Practice – Avoiding Plagiarism.

TEXT BOOKS & REFERENCES:

1. Intellectual property right, Deborah, E. Bouchoux, Cengage learning Publications, 2008.
2. Intellectual Property Right - Unleashing the knowledge economy, Prabuddha Ganguli, Tata Mc Graw Hill Publishing Company Ltd, 2008.
3. The Little book of Plagiarism, Richard A.Posner, Pantheon Publishers, 1st Ed, 2007.

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
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Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

Elective II: SOA AND WEB SERVICES

Objective of the subject: The objective of the course is to highlight on Integration and realization of Service Oriented Architecture with Web Services. The syllabus also focuses on topics like SOA Governance, Business Process Management, Integration of SOA and Web Services.

UNIT I:

(10 Hrs)

Introduction to SOA and Web Services: Evolution of SOA Web Services Service - Oriented Enterprise-Service Oriented Architecture-Understanding Web Services-Integrating Web Services with SOA.**The Service Architecture:** SOA services-Service Lifecycle-SOA Models-Principles of SOA-SOA Mapping Components

UNIT II:

(10 Hrs)

SOA Governance: Governance-Overview of SOA Governance-Organization of SOA Governance-Governance Policies-Governing Analysis Process-Governing Run-Time Behavior

UNIT III:

(10 Hrs)

SOA and Business Process Management: Business Process Management Concepts-Role of Business Process Management in SOA-Working with Dynamic BPM and SOA environment-Co-ordination BPM, SOA and Web Services

UNIT IV:

(10 Hrs)

Web Service Architecture & its Specifications: Application Components-Elements of Web Services-Web Service Models-REST Architecture. **Web Service Protocols and Technologies:** XML-SOAP-WSDL-UDDI-ebXML

UNIT V:

(10 Hrs)

Integrating SOA and Web Services: Overview of Integration-Design and development of SOA for integration-The role of XML and Web Services in SOA for integration-Building integration and interoperability using XML and Web Services-J2EE and .NET interoperability

TEXT BOOK

1. **Integrating SOA and Web Services**, N.Sudha Bhuvanewari and S.Sujatha, River Publishers Series in Information Science and Technology, 2011.

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Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER
ELECTIVE II: NETWORK AND INFORMATION SECURITY

Objective of the Subject: This paper covers the use of fault tolerance techniques in system that is used in non critical applications. The design of fault tolerant hardware and software is also discussed.

Unit I: (10 Hrs)

Introduction to computer security: Basic concepts, threat models common security goals. Cryptography and cryptographic protocols, including encryption, authentication, message authentication codes, hash functions, one-way functions, public-key cryptography, secure channels, zero knowledge in practice, cryptographic protocols and their integration into distributed systems and other applications.

Unit II: (10 Hrs)

Operating system security: Memory protection, access control, authorization, authenticating users, enforcement of security, security evaluation, trusted devices, digital rights management.

Unit III: (10 Hrs)

Network Security: Firewalls, intrusion detection systems, viruses and worms, web security. Case studies: DNS, IPsec.

Unit IV: (10 Hrs)

Software Security: Secure software engineering, defensive programming, buffer overruns and other implementation flaws.

Unit V: (10 Hrs)

Case Studies: Privacy, mobile code, digital rights management and copy protection, trusted devices, denial of service and availability, network based attacks, security and the law, electronic voting.

TEXT BOOKS:

1. **Security in Computing**, Charles P Pfleeger and Shai Lawrence Pfleeger, Fourth Edition, Prentice Hall, 2007.
2. **Security Engineering: A Guide to Building Dependable Distributed Systems**, Ross J. Anderson and Ross Anderson, Wiley, 2008.
3. **Computer Security Basics** (Paperback), Debby Russell and Sr.G.T.Gangemi, 2nd edition, O'Reilly Media, 2006.
4. **Information Security Fundamentals**, Thomas R. Peltier and John Blackley, 2nd Edition, Prentice Hall, 2005.

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2018-19

Subject Code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
B Sc (Computer Science)
Effective from the academic year: 2018 – 2019

SIXTH SEMESTER

SKILL BASED SUBJECT: SOFT SKILLS

Objective of the subject: This course content guides and helps students to improve skills such as Communication, Body Language, Presentation, and Written Communication Skills.

UNIT I (6 Hrs)

Soft skills with special focus on ITES: Soft skills - Communication skill as soft skill – Ability to express and explain – Clear and Lucid method of expression - Logical Reasoning.

UNIT II (6 Hrs)

Body language - Motivation - Lead – Appeal – Benefits - Goal setting. Telephone etiquette - Holding and answering – Voice modulation – Greetings – Salutation.

UNIT III (6 Hrs)

Presentation Skills - Planning – Preparation and delivery – Eye contact – Feed back - Interview skills. Dress code – Manners.

UNIT IV (6 Hrs)

Written Communication Skills: Verbal Reasoning - Writing a resume - Without error – visual presentation - Time and stress Management. Prioritize work – schedule timings – listening to music and yoga for reducing the stress.

UNIT V (6 Hrs)

Professional Ethics: Respect views, sentiments – Leadership Skill - Trust, share and stay together – accept responsibility – take up challenges.
Search Engines, grammar checking using tools, Article rewriting, Plagiarism checker.

Text Books

1. Interviewing in Action Relationships, Process & Change, Bianca Cody Murphy, Carolyn Dillon, Brooks Cole, 2003.
2. Test of Reasoning, Edgar Thorpe, Tata McGrawHill, 2007, 4th Edition.
3. Developing Communication Skills, Krishna Mohan, Meera Banerji, Macmillan India Ltd, 2004.



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2018-19

Subject code:

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE.

B.Sc (Information Technology)

Effective from the academic year: 2018 - 2019

FOURTH SEMESTER

Skill Based Subject: FRAMEWORK TECHNOLOGY and RDBMS LAB

Objective of the subject: This paper provides an experience on creating webpages, manipulation of web controls, implementing the validation controls and Emphasis is also given on database connectivity and manipulation of data through this connectivity.

Framework Technology

1. Creation of a Simple ASP.NET Web Page.
2. Creating and manipulation with Web Controls.
3. Create and manipulate with Rich Web Controls (AdRotator)
4. Creation and manipulation of Validation controls.
5. Displaying Data in the DataGrid.
6. Manipulation of data using SQL Server Database.
7. Database Connectivity using ADO.NET

RDBMS

8. Table creation using Integrity Constraints and apply DDL and DML commands.
9. Programs using Cursors.
10. Programs using Exception Handling.
11. Programs using Procedures and Functions.
12. Programs using Triggers.

Note: Develop a project / case study using the above applicable concepts.