

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	Theory TEE : 3 hrs : Practicals TEE : 3hrs
	II	English	English I	3	25	75	100	5	
	III	Core	C Programming	4	25	75	100	5	
	III	Allied	Mathematical Foundations for Computer Applications	5	25	75	100	6	
	III	Core	C Programming 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	Computer Organisation and Architecture	4	25	75	100	5	
	III	Allied	Computer Based Optimization Techniques	5	25	75	100	5	
	III	Core	Data Structures	4	25	75	100	4	
	III	Skilled Based Subject	Data Structures Lab	2	40	60	100	4	
	IV	Environmental Studies	Environmental Awareness	2	25	75	100	2	
III	IV	Basic Tamil /Advanced Tamil Non major Elective	Basic Tamil I/Advanced Tamil I	2	100	NA	100	2	
			Personality Development and Softskills		40	60			
	III	Core	Computer Networks	4	25	75	100	5	
	III	Core	Operating Systems	4	25	75	100	5	
	III	Core	Java Programming	4	25	75	100	5	
	III	Allied	Embedded System and its Applications	5	25	75	100	5	
	III	Core	Java Programming Lab	2	40	60	100	4	
	IV	Skilled Based Subject	Professional Communication	2	25	75	100	4	
	V	Extension Activities	NSS / Computer Awareness Programme	1	Grade **			-	
IV	IV	Basic Tamil /Advanced Tamil Non major Elective	Basic Tamil II /Advanced Tamil II	2	100	NA	100	2	
			Basic in Business Process Outsourcing		40	60			
	III	Core	Relational Database Management System	4	25	75	100	5	
	III	Core	Open Source Software	4	25	75	100	5	
	III	Core	Python Programming	4	25	75	100	5	
	III	Allied	Underwater Networking	5	25	75	100	5	
	III	Core	Open Source Software Lab	2	40	60	100	5	
	IV	Value Education	Indian Society, People and Culture.	2	25	75	100	3	
V	III	Core	Object Oriented Analysis and Design	4	25	75	100	4	
	III	Core	Web Design and Markup Language	4	25	75	100	5	
	III	Core	Software Engineering	4	25	75	100	5	
	III	Core	.NET Programming	5	25	75	100	5	
	III	Core	.NET Programming and Web Design Lab	2	40	60	100	4	
	III	Elective	Elective - I	5	25	75	100	4	
	IV	Skilled Based Subject	Aptitude*	2	25	75	100	3	
VI	III	Core	Cyber Security	4	25	75	100	4	
	III	Core	Mobile Application Development	5	25	75	100	4	
	III	Core	Mobile Application Development Lab	2	40	60	100	4	
	III	Elective	Elective - II	5	25	75	100	4	
	III	Core	Project and Viva Voce	7	25	75	100	12	
	IV	Skilled Based Subject	Soft Skills *	2	25	75	100	2	
Total				140	1120	2880	4000	180	

* Both CAM and TEE marks will be evaluated internally.

Basic Tamil/Advanced Tamil - 100 Marks CA only.

BI-02
2018-19

Elective List

Elective I

- 1 Enterprise Resource Planning
- 2 Data Mining
- 3 Artificial Intelligence and Expert Systems
- 4 Computer Graphics
- 5 Integrating SOA and Web Services
- 6 Cloud Computing
- 7 Microprocessor and Assembly Language Programming

Elective II

- 1 Client/Server Technology
- 2 Parallel Computing
- 3 Mobile Communications
- 4 Network Security
- 5 Bioinformatics
- 6 Information Security
- 7 Scripting Languages
- 8 Air and Sea Navigation

Project & Viva Voce Split up		
	CA	
Review I		10
Review II		15
	TEE	
Viva		50
Documentation		25

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BI-03
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

FIRST SEMESTER

CORE: C PROGRAMMING

Objective of the subject: This paper provides a brief introduction to C language. It gives detailed description about syntax and semantics of C Languages along with concepts like pointers, files and pre processor directives.

UNIT I

(9 Hrs)

Introduction to C Programming Language-Data types – Identifiers – Variables - Scope of variables - Type Qualifiers - Storage class specifiers - Variable Initialization - Constants. Operators – Assignment – Arithmetic - Increment/Decrement – Relational - logical-Bit wise-Ternary- Address and pointer operator - SizeOf – Comma – Dot - Arrow operator -The [] and () operators – Expressions.

UNIT II

(10 Hrs)

Selection statements - Iteration Statements - Jump Statements - Expression Statements - Block Statements - Functions - General form of Functions - Function prototypes - Function Arguments - Arguments to main function - Return Statement – Recursion -Declaring variable length parameter list.

UNIT III

(11 Hrs)

Arrays - Single dimension - Generating a pointer to an array - Passing Single dimension arrays to functions – Strings - Two dimensional arrays - Arrays of strings - Multidimensional Arrays - Indexing Pointers - Array Initialization - Variable length arrays - Structures-Array of Structures - Passing structures to functions - Structure pointers - Arrays and structures within structures – Unions - Bit fields – Enumerations –Typedef.

UNIT IV

(10 Hrs)

Pointers - Pointer Expressions - Pointers and arrays - Multiple indirection - Initializing pointers - Pointers to Functions - Dynamic memory allocation.

UNIT V

(10 Hrs)

Files - File system basics - fseek() and random access I/O - fscanf() and fprintf() - Preprocessor-#define, #error, #include - comments.

TEXT BOOKS

1. C The Complete Reference, Herbert Schildt, Tata McGraw-Hill, Fourth Edition, 2008.
2. Programming in ANSI C, E.Balagurusamy, Tata McGraw-Hill, Sixth Edition, 2012.
3. C Programming, Ashok Kamthane, Pearson Education, Second Edition, 2011.
4. Programming with C - Schaum's Outlines Series, Byron Gottfried, Third Edition, Tata McGraw Hill, 2011

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BI-04
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

FIRST SEMESTER

Allied: MATHEMATICAL FOUNDATIONS FOR COMPUTER APPLICATIONS

Objective of the subject: Provides an introduction to the conceptual and mathematical foundations of computer science and its applications in functional programming as well as reasoning techniques based on propositional logic and mathematical induction.

UNIT I (12 Hrs)

Numerical Methods: Solving simultaneous linear algebraic equations: Gauss Elimination – Gauss Siedel methods. Interpolation: Newton's forward and backward interpolation formula - Lagrange's interpolation. Numerical Integration: Trapezoidal rule and Simpson's 1/3rd rule.

UNIT II (8 Hrs)

Probability & Statistics: Sample space and events, axioms of probability. Baye's theorem. Correlation – Karl Pearson's co-efficient of correlation. Regression – Regression equations and its coefficient – Curve fitting by the method of least squares (fitting straight lines only).

UNIT III (10 Hrs)

Mathematical Logic: Connectives – Truth Tables, Well-formed formula, Tautology, Equivalence of formulas, duality law, Normal forms, Inference theory for statement calculus(direct and indirect method).

UNIT IV (10 Hrs)

Relations And Functions: Binary relations, Composition of relations, Equivalence of Relations, Composition of Functions, Inverse functions, One-to-one, Onto, One to one-on-to functions.

UNIT V (10 Hrs)

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

TEXT BOOKS

1. Numerical Methods in Science and Engineering, M.K.Venkatraman, the National Publishing Company, 5th Edition 2007. (For UNIT I)
2. Statistical Methods, S.P.Gupta, S.Chand&Sons, 36th Revised Edition, 2009. (For UNIT II)
3. Discrete Mathematical Structures with Applications to Computer Science, J P Tremblay and R P Manohar, McGraw Hill, 27th Reprint, 2006. (For Units III, IV & V)

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BI-05
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

FIRST SEMESTER

CORE: C PROGRAMMING LAB

Objective of the subject: The programming paper gives an experience on working with arrays, functions, structures, pointers, files, preprocessor directives also using C Language.

1. Simple Input / Output, Variables & Expression Statements
2. Selection statements
3. Iteration Statements
4. Single & Multi dimensional Array
5. Functions & Recursive Functions
6. Structures
7. Pointers
8. Files
9. Preprocessor directives
10. Command Line Arguments



BI - 06
2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA

Effective from the academic year: 2018-2019

SECOND SEMESTER

CORE: COMPUTER ORGANISATION AND ARCHITECTURE

Objective of the subject: To provide the basic knowledge on computer arithmetic, machine language instruction set, counters, Input/Output and memory systems. The objective is to provide the students an insight into the fundamental building blocks of a computer.

UNIT I (10 Hrs)

Number Systems: Decimal, Binary, Octal, Hexadecimal - Conversion from one to another – complements - Binary codes - Basic Logic Gates – Basic Theorems and Properties of Boolean Algebra - Sum of products - Product of sums - Karnaugh map - Don't care conditions.

UNIT II (9 Hrs)

Combinational Logic circuits Design: Adders - Half Adder, Full Adder - Subtractor – Half Subtractor - Full Subtractor - Decoders - Demultiplexers – Encoders - Multiplexers- Flip Flops: RS, JK Flip Flops.

UNIT III (10 Hrs)

Ripple Counters – Synchronous Counters - Register Transfer - Arithmetic Micro Operations : Binary Adder Subtractor - Logic Microoperations – Shift Microoperations - Arithmetic Logic Shift Unit - Stack Organization - Instruction formats.

UNIT IV (10 Hrs)

Input - Output organization: Peripheral Devices-Asynchronous Data Transfer (Strobe & Handshaking Method) - Modes of Transfer - DMA.

UNIT V (11 Hrs)

Memory Organization: Memory Hierarchy – Main Memory - Auxiliary Memory - Cache Memory .

TEXT BOOKS

1. Computer System Architecture, M Morris Mano, Prentice-Hall India, 2007
2. Digital Logic and Computer Design, M Morris Mano Prentice-Hall India, 2016.

BT - 07

2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

SECOND SEMESTER

Allied: COMPUTER BASED OPTIMIZATION TECHNIQUES

(No Derivations; problems only)

Objective of the subject: This subject highlights on the various optimization techniques and the methodologies that includes Linear Programming, Transportation & Assignment Problem, Games & Strategies, Replacement Problem, Queuing Theory, CPM/PERT Method.

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)

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.

Replacement Problem: Introduction – Replacement of equipment/asset that deteriorates gradually- – Replacement of equipment that fails suddenly.

UNIT IV (8 Hrs)

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

UNIT V (10Hrs)

Network Scheduling by PERT/CPM: Network: Basic Components – Rules of network construction – Numbering the events – Critical path analysis: Forward & Backward Pass Calculations. Probability considerations in PERT: Probability of meeting the schedule time – PERT Calculation.

TEXT BOOKS

1. Operations Research- Kanti Swarup, P.K.Gupta, Manmohan, Sultan Chand & Sons, 16th Edition, 2012.
2. Problems in Operations Research, P.K. Gupta, Dr.D.S.Hira, S. Chand & Company, Reprint 2007.
3. Operations Research, A.C.S.Kumar, Published by Yesdee, Revised edition, 2015.

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BI-08
2018-19

Subject Code :

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

BCA

Effective from the academic year: 2018-2019

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 – Selection 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.

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 BOOKS

- 1.Data Structures Schaum's Outlines, Seymour Lipschutz, G.A Vijayalakshmi Pai, Tata McGraw-Hill Companies, Indian Adapted Edition, 2006.
2. Fundamentals of Data Structures, Ellis Horowitz and Sartaj Sahni, Galgotia Publication Pvt. Ltd., 2012.

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BI-09
2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SECOND SEMESTER
SKILL BASED SUBJECT: DATA STRUCTURES LAB

Objective of the subject: The programming paper gives an experience on working with stacks, queues, and linked lists; searching and sorting techniques.

1. Stack Operations
2. Queue Operations
3. Singly linked list
4. Linear Search
5. Binary Search
6. Infix to Postfix Notation
7. Bubble Sort
8. Selection Sort
9. Quick Sort
10. Insertion Sort



BT - 10
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

THIRD SEMESTER

CORE: COMPUTER NETWORKS

Objective of the subject: This subject helps in understanding the concepts and mechanisms of Telecommunication and Computer Network Engineering which includes details about Signaling, Encoding, Modulating, Error Detection and Data transfer.

UNIT I

(8 Hrs)

Introduction: Data communications - Networks- Protocols and standards. Network Models: Layered tasks - The OSI model - Layers in the OSI model.

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

UNIT II

(10 Hrs)

TCP/IP protocol suite - Addressing. Data and signals: Analog and digital -Transmission impairment- Performance. Multiplexing - Transmission media: Guided media – Unguided media - Virtual circuit networks.

UNIT III

(12 Hrs)

Error Detection and Correction: Introduction – Block coding – Checksum. Network layer: Delivery – forwarding – Unicast routing protocols-Multicast routing protocols. Congestion Control and Quality of service: Data traffic –Congestion –Congestion control.

UNIT IV

(10 Hrs)

Transport layer: Process to Process Delivery: Client/Server Paradigm - Multiplexing and Demultiplexing – Connectionless Versus Connection Oriented Service – Reliable versus Unreliable- Protocols. TCP.

UNIT V

(10 Hrs)

Application Layer: Domain Name system: Name space- Domain name space - Distribution of name space-Resolution. Electronic mail. Cryptography: Introduction – Symmetric key cryptography - Asymmetric key cryptography – Software Defined Networks: Introduction.

TEXT BOOKS

1. Data Communication and Networking, Behrouz A Forouzan, Tata McGraw Hill, Fifth edition, 2013.
2. Computer Networks, Andrew S. Tanenbaum & David J. Wetherall, Pearson Education, 5th Edition, 2012.
3. SDN: Software Defined Networks: An Authoritative Review of Network Programmability Technologies, Thomas D. Nadeau & Ken Gray, O'Reilly, First Edition, 2013

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BT-11

2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA

Effective from the academic year: 2018-2019
THIRD 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 CPU scheduler, memory management system, secondary memory management, handling concurrent processes.

UNIT I (8 Hrs)

Introduction to Operating Systems: Definition of OS - Early History - Process Concepts: Definition of process - Process states - Process Management- Interrupt - Interprocess communication- Mutual exclusion - Semaphores - Deadlock and indefinite postponement.

UNIT II (12 Hrs)

Real Memory Organization and Management: Memory Organization- Memory Management - Memory Hierarchy - Memory Management Strategies - Contiguous Vs Non-contiguous storage allocation - Single user contiguous storage allocation - Fixed partition multiprogramming - Variable partition multiprogramming - Multiprogramming with storage swapping.

UNIT III (10 Hrs)

Virtual Memory Management: Basic Concepts - Paging - Demand Paging- Anticipatory Paging - Page replacement strategies - Working set Model, Page size - Segmentation. Processor Scheduling: Scheduling Levels - Preemptive Vs non-preemptive scheduling - Priorities - Scheduling Algorithms- Deadline Scheduling- FIFO - RR - SPF - SJF - SRT - HRRN.

UNIT IV (10 Hrs)

Disk Performance Optimization: Characteristics of moving head disk storage - Need for disk scheduling - Disk Scheduling Strategies - FCFS - SSTF - SCAN - C-SCAN.

UNIT V (10 Hrs)

File and Database Systems: Data Hierarchy - Files - File system - File Organization - File Allocation - Free space Management - Access Control Matrix.

TEXT BOOKS

1. Operating System, Harvey M. Deital, Paul J. Deitel, David R. Choffnes, 3rd Edition, Pearson Education, 2007

BI -12

2018-19

Subject Code :

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

BCA

Effective from the academic year: 2018-2019

THIRD SEMESTER

CORE: JAVA PROGRAMMING

Objective of the subject: The objective is 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.

UNIT I (8 Hrs)

Introduction to Java - Importance of Java – Bytecode – Buzzwords. Overview of Java: Object oriented programming-Simple program-Lexical issues. Data types, Variables and Arrays-Operators.

UNIT II (10 Hrs)

Control statements-Introduction to Classes: class fundamentals - declaring objects - constructors-This keyword - Garbage Collection - finalize() method - Overloading Methods - Recursion-access control - static – final - nested and inner class - command line arguments - Inheritance.

UNIT III (10 Hrs)

Packages and Interfaces: Definition - Importing Packages - Interfaces. Exception Handling - try and catch - nested try statements. Multithreading Programming: Creating a thread and multiple thread – priorities – synchronization - interthread communication.

UNIT IV (10 Hrs)

String Handling: constructors – operations – comparison – extraction – searching - string buffer. Applet Class: basics – architecture – skeleton – repainting - APPLET tag - passing parameters -getDocumentBase() - getCodeBase() - AppletContext and showDocument() - AudioClip and AppletStub Interface - outputting.

UNIT V (12 Hrs)

AWT classes: Windows fundamentals - frame window - working with graphics – colour - fonts -Managing text output using Font metrics. AWT controls: labels – buttons - check boxes – lists -scroll bars - text field - text area.

TEXT BOOK

1. Java The Complete Reference, Herbert Schildt, Tata McGraw-Hill, Eighth edition, 2011.
2. www.spoken-tutorial.org/

BI-13
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

THIRD SEMESTER

ALLIED: EMBEDDED SYSTEM AND ITS APPLICATIONS

Objective: The objective of this paper is to provide an insight on basic electronic components, microcontrollers, sensors, robotics and give awareness to the students about their applications in the real-time environment.

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.

TEXT BOOKS

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

BI-14

2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
THIRD SEMESTER

CORE: JAVA PROGRAMMING LAB

Objective of the subject: This paper gives a hands-on experience on implementing the OOPS concepts like overloading, inheritance, applets, packages, exception handling and file concepts using Java.

Write Programs using the following concepts.

1. Inheritance.
2. String manipulation.
3. Method overloading.
4. A Java Program for Interface.
5. A Java Program for User defined Packages.
6. Exception handling.
7. Java program for handling threads.
8. File Operations.
9. Simple Java Applet.
10. AWT Controls.



BI-15
2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
FOURTH SEMESTER

CORE: RELATIONAL DATABASE MANAGEMENT SYSTEM

Objective of the subject: This course focuses on the design of a database starting from the conceptual design to the implementation of a database schema and user interfaces to the database. Students will learn about database design concepts, data models (Entity-Relationship and Relational Model), and the database query language SQL and components of a database management system. Further topics include query processing and optimization techniques, transaction management, and storage.

UNIT I (10 Hrs)
Basic Concepts: Data Modeling for a Database, Records and Files, Abstraction and Data Integration, The Three-Level Architecture Proposal for a DBMS, Components of a DBMS, Advantages and Disadvantages of a DBMS.

UNIT II (10 Hrs)
Data Models: Introduction, Data Associations, Data Models Classification, Entity-Relationship Model, Relational Data Model, Network Data Model, Hierarchical Model.

UNIT III (8 Hrs)
The Relational Model: Introduction, Relational Databases, Relational Algebra, Relational Calculus: Tuple Calculus and Domain Calculus.

UNIT IV (10 Hrs)
Relational databases: Basic Structure – Set operations - Aggregate Functions - Null Values - Nested Sub queries - Views – Modification of the database - Joined Relations - Data Definition Language.

UNIT V (12 Hrs)
Relational database design: Atomic Domains and First Normal Form – Decomposition Using Functional Dependencies: Keys and Functional Dependencies - Boyce-Codd Normal form - BCNF and Dependency Preservation - Third Normal form – Higher Normal Form.

TEXT BOOKS

1. Bipin C.Desai, "An Introduction to Database Systems", Galgotia Publications Pvt Ltd, Revised Edition 2006.
2. Abraham Silbershatz, Henry F. Forth, S. Sudarshan, "Database System Concepts", Fifth Edition 2006.

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BI-16
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

FOURTH SEMESTER

CORE: OPEN SOURCE SOFTWARE

Objective: The course is designed to provide an insight on the open source licensing and policies, Open source softwares MySQL and PHP .

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.

UNIX: Getting Started-The UNIX Architecture and Command Usage – General Purpose Utilities - The File System - Handling Ordinary Files – Basic File Attributes.

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 for 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. Paul Kavanagh, Open Source Software, Elsevier Digital Press, 2004, 1st Edition. (Unit I)
2. UNIX Concepts and Applications, Sumitabha Das, 4th Edition, Tata McGraw-Hill, 2008. (Unit I)
3. Vikram Vaswani, MySQL: The Complete Reference, Tata McGraw Hill, 2004. (Unit II)
4. 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)
5. www.spoken-tutorial.org/

BI-17
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

FOURTH SEMESTER

CORE: PYTHON PROGRAMMING

Objective:

The course is designed to provide an introduction to the Python programming language. The focus of the course is to provide students with an introduction to programming, , Install and run the Python interpreter - I/O – Tuples – Files using the Python programming language.

Unit I

(8 Hours)

Introduction to Python: Python - Features – Execution - Viewing the Byte Code - Flavors of Python - Python Virtual Machine (PVM) - Frozen Binaries - Memory Management in Python - Garbage Collection in Python - Comparisons between C and Python - Comparisons between Java and Python.

Writing Our First Python Program: Installing Python for Windows - Setting the Path to Python - Executing a Python Program.

Unit II

(8 Hours)

Datatypes in Python: Comments – Docstrings – Variables - Datatypes – Built-in datatypes - bool Datatype - Sequences – Sets - Literals – Characters – User defined Datatypes - Constants - Identifiers and Reserved words - Naming Conventions.

Operators in Python: Operator - Arithmetic - Assignment - Unary Minus - Relational - Logical - Boolean - Bitwise - Membership - Identity - Operator Precedence and Associativity. **Input and Output:** Output statements - Input Statements - Command Line Argument.

Unit III

(12 Hours)

Control Statements: if - A Word on Indentation - if ... else - if ... elif ... else - while - for - Infinite - Nested - else - break - continue - pass - assert - return.

Arrays in Python: Array – Advantages – Creation - Importing the Array Module - Indexing and Slicing on Arrays - Processing the Arrays - Types of Arrays - Working with Arrays using numpy - Creating Arrays using array() - Creating Arrays using linspace - Creating Arrays using logspace - Creating Arrays using arange() – Function - Creating Arrays using zeros() and ones() Functions - Mathematical Operations on Arrays - Comparing - Aliasing - Viewing and Copying Arrays - Slicing and Indexing in numpy Arrays - Dimensions of Arrays - Attributes of an Array - Working with Multi-dimensional Arrays - Indexing in Multi-dimensional Arrays - Slicing the Multi-dimensional Arrays.

Unit IV

(12 Hours)

Strings and Characters: Creating Strings – String functions - String Testing Methods - Formatting the Strings - Working with Characters.

Functions: Difference between a Function and a Method - Defining and Calling a Function - Returning from a Function - Functions are First Class Objects - Pass by Object Reference –

Op.

BI-18

2018-19

Subject Code :

Formal and Actual Arguments - Positional Arguments - Keyword Arguments - Default Arguments - Variable Length Arguments - Local and Global Variables - The Global Keyword - Passing a Group of Elements to a Function - Recursive Functions - Anonymous Functions or Lambdas - Function Decorators.

Unit V

(10 Hours)

Lists and Tuples: List - Creating Lists using range() Function - Updating the Elements of a List - Concatenation of Two Lists - Repetition of Lists - Membership in Lists - Aliasing and Cloning Lists - Methods to Process Lists - Nested Lists - Nested Lists as Matrices. Tuples: Creating Tuples - Accessing the Tuple Elements - Basic Operations on Tuples - Functions to Process Tuples - Nested Tuples.

Files: Persistence - Opening files - Text files and lines - Reading files - Searching through a file - Using try, except, and open - Writing files.

Text Books:

1. Dr. R. Nageswara Rao, "Core Python Programming", Dreamtech Press October 2016.
2. Python for Everybody, Exploring Data Using Python, Charles Severance, kindle Publication, 2016.

S.

BI-19
2018-19

Subject Code :

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

BCA

Effective from the academic batch: 2018 -2019

FOURTH SEMESTER

ALLIED: UNDERWATER NETWORKING

Objective of the subject: This course provides a broad coverage of trends of Underwater Networking. Covered topics include network architectures, types of communication, Sea bed temperature, underwater sensor networking, data collection and analysis along with some applications of underwater networking.

UNIT I (10 Hrs)

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

UNIT II (10Hrs)

Types of Communication: Radio communication - Optical Communication - Signal frequency- Communication range – Data rate - Advanced Digital communication. Wireless & Mobile Communication Networks: Underwater acoustic communication - Underwater wireless sensor networks

UNIT III (10Hrs)

Sea bed temperature: Deep Sea under water pressure - Concept of sea level changes - seismic stratigraphy - sequence stratigraphy - physical and chemical properties of seawater.

Underwater Sensor Networking: Underwater MAC-Traditional Approaches of Underwater Sensor deployment-Ocean Sampling Networks-Pollution Monitoring - Environmental Monitoring and Tactical surveillance systems- Major challenges in design of Underwater Networks

UNIT IV (10Hrs)

Data Collection and Analysis: Correlation receivers - Automated decision making – Data Types – Analog – Digital – Analog to digital Conversion – Data Storage – Indexing – Analysis – Test Beds – Simulators and models

UNIT V (10Hrs)

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. Robert J. Urick, Principles of Underwater Sound, Peninsula Publication, Third Edition, 1996
2. Ask T., Handbook of Marine Surveying, Sheridan House, 2007.
3. 'Principles of Underwater Sound' Robert J. Urick, McGraw Hill Book Company, New York (1975)
4. Tunnicliffe V., Barnes C., Dewey R.(2008) Major advances in cabled ocean observatories (VENUS and NEPTUNE Canada) in coastal and deep sea settings. IEEE/OES US/EU-Baltic Int. Symp., Tallinn, Estonia, May 2008, 1–7, IEEE.
5. Web References



BI-20
2018-19

Subject Code :

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

**Effective from the academic batch: 2018 -2019
FOURTH SEMESTER**

CORE: OPEN SOURCE SOFTWARE LAB

Objective of the subject:

This course brings in the knowledge of open source software and to implement various functions of PHP, MySQL and Python practically.

Write a program using the following concepts.

UNIX

1. Unix commands

PYTHON

2. Expressions
3. Operators
4. Looping
5. Branching
6. Arrays
7. Functions
8. Lists
9. Tuples
10. File Handling

MySQL and PHP

11. Simple Queries of DML, DDL, DCL. (MySQL Database).
12. PHP user defined functions.
13. Create a Dynamic Web page with PHP by accessing data from MySQL.

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

BT-21
2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
FIFTH SEMESTER

CORE: OBJECT ORIENTED ANALYSIS AND DESIGN

Objective of the subject: This subject gives guidance on the construction of object oriented systems. It helps in understanding the fundamental concepts and notations of object oriented analysis and design.

UNIT I (10 Hrs)
An Overview Of Object Oriented Systems Development : Object Basics: Object oriented philosophy – objects – classes – attributes - object behavior and methods -encapsulation and information hiding - class hierarchy – polymorphism - object relationships and associations - aggregations and object containment. Case study – object and identity - object persistence. Object oriented systems development life cycle: Software development process - building high quality software - use- case driven approach - reusability.

UNIT II (12 Hrs)
Object Oriented Methodologies: Rumbaugh et al.'s object modeling technique - Booch methodology - Jacobson et al Methodologies – patterns - frameworks - the Unified Approach. Unified modeling language: Static and dynamic models - UML diagrams - UML class diagrams - use-case diagrams - UML dynamic modeling – packages - UML extensibility and UML Meta-Model.

UNIT III (10Hrs)
Object Oriented Analysis process : Identifying use cases - Business object analysis - use-case driven object oriented analysis - business process modeling - Use-case model - Developing effective documentation . Classification - Classification theory - Noun Phrase approach - common class patterns approach - Use-case driven approach - classes, responsibilities, and collaborators - Naming classes.

UNIT IV (8 Hrs)
Identifying Object Relationships, Attributes And Methods. Associations - Super-Subclass relationships - A-part of relationships - Class Responsibility - Object responsibility. The Object oriented design process and design axioms: Corollaries - Design patterns.

UNIT V (10 Hrs)
Designing Classes, UML object constraint languages - Designing classes - Class visibility - Refining attributes - Designing methods and protocols - Packages and managing classes. Access Layer: Designing Access layer classes - View layer: User Interface design as a creative process - Designing view layer classes - Macro level process – Micro Level Process – The purpose of a view layer interface.

TEXT BOOKS

1. Object Oriented Systems Development using the Unified Modeling Language, Ali Bahrami, McGraw Hill, Publication, 1999, Reprint 2008.

BT - 22
2018 - 19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

FIFTH SEMESTER

CORE: WEB DESIGN AND MARKUP LANGUAGE

Objective of the subject: The goal of this course is to present an overview of the Internet as a global resource for the people and provides the basic knowledge for designing a web page or websites using HTML and XML. The concept of style sheets is also discussed for formatting the XML documents.

UNIT I (8 Hrs)

Getting started: Internet-Web Browser-Web Server-Designing the Web site-Creating a web page with HTML basics: Basic elements-lists.

UNIT II (12 Hrs)

Creating a web page with HTML Linking - Creating web page with HTML text formatting: text formatting and alignment- character styles-font and sizes-using colors for web-preformatted text-horizontal lines-line break-displaying special characters-Images in HTML-Tables.

UNIT III (10 Hrs)

Frames: Creating frames-attributes and linking-complex framesets-inline frames- Image maps-forms and CGI Scripts. DHTML - CSS.

UNIT IV (10 Hrs)

Introduction to XML-XML Basics: tag format-declaration-elements-attributes-comments-character entities-CDATA blocks-example document. Document Type Definition-XML Schema simple types- XML Schema complex types- XML namespaces.

UNIT V (10 Hrs)

XSL transformation-XPath language -Cascading Style Sheets-XLink and XPointer: Simple links-extended links-displaying the links-linking by element identity, position and hierarchy.

TEXT BOOKS

1. Web Publishing, Monica D' Souza, Jude D' Souza, Tata McGraw-Hill Publications, Edition 2001.
2. XML - How to Program, H.M. Deitel, J.M. Deitel, T.R. Nieto, T.M. Lin, P. Sadhu, Pearson Education, 2013.
3. XML in Easy Steps, Mike Mcgrath Dreamtech Press Publicatio, Reprint Edition 2012.

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BT-23
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

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.

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BI-24
2018-19

Subject Code :

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

BCA

Effective from the academic year: 2018-2019

FIFTH SEMESTER

CORE: .NET PROGRAMMING

Objective of the subject : This subject highlights on Introduction to .NET Framework, .NET Languages, Introduction to VB.Net, Controls in VB.Net, Structure of ASP.NET ,Web Controls , State Management - Rich Text Controls . It also focuses on Data Source Binding and how to work with Data Grid.

UNIT I

(10 Hrs)

Introducing the .NET Framework : The Evolution of Web Development – The .NET Framework - The Common Language Runtime - .NET Class Library - .NET Languages - Variables and Datatypes - Operations - Methods - Basics of Classes - Building a Basic Class - Passing Parameters by Reference and by Value - Understanding Namespaces and Assemblies.

UNIT II

(10 Hrs)

Introduction to Visual Basic.Net : The Windows Graphical User Interface - The Object Model - The Three Step Process - The Visual Studio Environment - Writing the First Visual Basic program. Controls : Introducing Controls, Working with Multiple Controls, Designing Applications for User Convenience, Coding for Control - Data: Variables and Constants - Calculations - Formatting Data - Handling Exceptions - Displaying Messages in Message Boxes.

UNIT III

(10 Hrs)

Developing ASP.NET Applications : Creating Websites - Anatomy of a Web Form - Visual Studio Debugging - Anatomy of an ASP.NET Applications - Introducing Server Controls - The Page Class - Application Events - ASP.NET Configuration. Web Controls : Stepping Up to Web Controls - The WebControl Base Class - Enumerations - List Controls - Table Controls - Web Control Events and AutoPostBack - Logging Exceptions - Page Tracing.

UNIT IV

(10 Hrs)

State Management : Problem of State - Transferring Information Between Pages - State Configuration - Application State. Validation: The Validation Controls - Server-Side Validation - Client-Side Validation - Validating with Regular Expressions. Rich Controls: The Calendar - The AdRotator - Creating a Simple User Control - User Control Events - Website Navigation : Defining a Site Map - Binding an Ordinary Page & a Master Page to a Site Map - URL Mapping and Routing - Menu Styles - Menu Templates.

UNIT V

(10 Hrs)

Working with Data : Understanding Databases - Configuring Database - SQL Basics - The Data Provider Model - Direct Data Access. Data Binding: Introducing Data Binding - Single-Value Data Binding - Repeated-Value Data Binding. The Data Controls: The GridView - Formatting the GridView - Sorting and Paging the GridView - Using GridView Templates.

BI-25
2018-19

Subject Code :

TEXT BOOKS

1. **Programming in Visual Basic.Net**, Julia Case Bradely, Anita C. Millspaugh ,Tata McGraw- Fifth Reprint ,2008
2. **Beginning ASP.NET 4.0 in VB 2010**, Matthew MacDonald, Apress, Berkeley, CA, USA, Second Edition, 2011.

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BI-26
2018-19

Subject Code :

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

BCA
Effective from the academic year: 2018-2019
FIFTH SEMESTER
CORE: .NET PROGRAMMING AND WEB DESIGN LAB

Objective of the subject:

This paper provides an experience on creating Windows application in VB.NET and Web application in ASP.NET. Demonstration of various controls such as Menus, Rich web controls, Validation Controls and interactive report generation are emphasized and introduces the concept of web designing.

VB.NET:

1. Create a login form to check the authentication of the user.
2. Design an application using basic controls.
3. Design a form to manipulate the dataset.
4. Generation of a Report from the database.

ASP.NET:

5. Create a Web Application for manipulation of Basic Web Controls
6. Create a Web Application for manipulating Rich Web Controls
7. Create a Web Application for the manipulation of Validation controls
8. Develop a Web application for database manipulation using SQL Server Database.

WEB DESIGN:

9. Design a web page with images, links and tables.
10. Design a web page using CSS.
11. Create a XML document for a database using DTD.
12. Design a XML Schema for a student database.

Note

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



BI-27
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

**Effective from the academic year: 2018-2019
FIFTH SEMESTER**

ELECTIVE I: ENTERPRISE RESOURCE PLANNING

Objective of the subject: This paper concentrates on basic concepts of ERP, ERP and related technologies, implementing ERP, ERP in action, business modules and the ERP marketplace.

UNIT I

(10 Hrs)

Introduction : Enterprise –An Overview – Introduction to ERP – Basic ERP concepts - Justifying ERP investments – Risks of ERP - Benefits of ERP – Examples for Open, proprietary and In-house ERPs.

UNIT II

(10 Hrs)

ERP and Technology: ERP and related technologies – Business process reengineering – Data warehousing – Data mining – On-line analytical processing – Product life cycle management – customer relationship management – Selection of ERP for an organization.

UNIT III

(10 Hrs)

ERP Implementation : To be or not to be – Implementation challenges – Implementation life cycle – Implementation methodologies – ERP project teams – Vendors and Consultants – Contracts with Vendors , Consultants and Employees – Training and education – Key success factors of ERP.

UNIT IV

(10 Hrs)

The Business Modules : Business Modules of an ERP Package – Finance – Manufacturing – Human Resources – Plant Maintenance – Materials Management – Quality Management – Marketing – Sales, Distribution and service.

UNIT V

(10 Hrs)

The ERP Market: ERP market place and marketplace dynamics - SAP AG – Oracle Corporation – PeopleSoft - JD Edwards – QAD Inc – SSA Global – Open ERP.

TEXT BOOK

1. ERP Demystified, Alexis Leon, Tata McGraw - Hill Publishing Company, Second Edition, Eighth Reprint, 2010.

BI-28
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

Effective from the academic year: 2018-2019

FIFTH SEMESTER

ELECTIVE I - DATA MINING

Objective of the subject: This course covers introduction to data mining, data mining applications and various techniques used to discover knowledge from data.

UNIT I

(10 Hrs)

Introduction : What is data mining?- Motivating challenges – The origins of Data Mining – Data Mining Tasks - Data: Types of Data – Data Quality – Data Preprocessing - Measures of similarity and dissimilarity.

UNIT II

(10 Hrs)

Classification: General Approach to solving classification problem – Decision tree induction – Rule-Based classifier – Nearest Neighbor classifiers – Artificial Neural Network.

UNIT III

(10 Hrs)

Association Analysis: Problem definition – Frequent itemset generation – Rule generation – Compact representation of frequent itemsets – Alternative methods – FP-growth algorithm – Decision Trees – Construction Algorithms – Presorting.

UNIT IV

(10 Hrs)

Cluster Analysis: What is cluster analysis? – Different types of clustering – k-means algorithm – Hierarchical clustering – Density-based clustering – Grid-based clustering – Partitioning Algorithms – Categorical Clustering – k-Medoid Algorithms.

UNIT V

(10 Hrs)

Data Mining Applications: Text Mining – Multimedia Mining – Spatial Data Mining – Business Intelligence - Applications of Business Intelligence - Some open source tools for data mining: Weka – RapidMiner.

TEXT BOOKS

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education, First Edition, 3rd impression 2009.
2. Arun K.Pujari, Data Mining Techniques, Universities Press, 2nd Edition, 2010.

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BI-29
2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
FIFTH SEMESTER

ELECTIVE I: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

Objective of the subject: This subject helps in understanding the concepts and mechanisms of Artificial Intelligence which includes details about Search process, game playing, Knowledge Representation, Expert System.

UNIT I

(10 Hrs)

Introduction to Artificial Intelligence (AI): Computerized reasoning-Artificial Intelligence- Characteristics of an AI problem – Problems representation in AI- State space representation - Problem reduction

UNIT II

(10 Hrs)

Search process: AI and search process - Brute force search techniques, Hill climbing- best first - A* algorithm - Beam search – Constraint satisfaction.

UNIT III

(10 Hrs)

AI and game playing – Major components of game playing program –Plausible move generator – Static evaluation – Function generator – Minimax Strategy –Alpha - Beta techniques- Problems on Computer game playing program.

UNIT IV

(10 Hrs)

Knowledge Representation: Logic, Propositional logic – Tautology – Contradiction and contingencies – Normal form – Predicate logic - Form-Rules of inference – Resolution - Unification algorithm.

UNIT V

(10 Hrs)

Introduction to Expert System: Definition – Characteristics, Architecture and descriptions of various modules. Knowledge engineering – Expert system life cycle – Difficulties in knowledge acquisition – Knowledge acquisition – Strategies – Expert systems – Major application areas. Qualitative study of Expert system like DENDRAL, MYCIN and R1.

TEXT BOOKS

1. Foundation of Artificial Intelligence & Expert System, K Sarukesi, V. Janakiraman, Macmillan Ltd, 2005
2. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivashankar. B. Nair, Tata Mc-Graw Hill, 2010.

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B7-30
2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

**Effective from the academic year: 2018-2019
FIFTH SEMESTER**

ELECTIVE I: COMPUTER GRAPHICS

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, Clipping.

UNIT I (10 Hrs)

Basic concepts: - Introduction – Uses of Computer Graphics – 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 (8 Hrs)

Line drawing algorithms: Simple DDA – Bresenham's line drawing algorithm – Circle generators. Two-dimensional Geometric transformations: Basic transformations, matrix representation – Composite transformation of translation- rotation- scaling – pivot point rotation – Fixed point scaling- Other transformations.

UNIT III (12 Hrs)

Two Dimensional Viewing: The Viewing Pipeline, Viewing Coordinate Reference Frame, Window- to- view port Coordinate Transformation. Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping.

UNIT IV (12 Hrs)

Graphical Input Devices – Keyboards – Mouse- Trackball and Space ball – Joysticks – Data Glove – Digitizers – Image Scanners – Touch Panels – Light Pens – Voice Systems - Hard Copy Devices . Color Models and Color Applications: Properties of Light – Chromaticity Diagram – XYZ Color Model – RGB Color Model – YIQ Color Model – CMY Color Model- HSV Color Model- HLS Color Model.

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, Second Edition., Pearson Education, 2004.
2. Principles of Interactive Computer Graphics, William M. Newman, Robert F. Sproull, Second Edition. 2007

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BT - 31
2018-19

Subject Code :

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

BCA

Effective from the academic year: 2018-2019

FIFTH SEMESTER

ELECTIVE I: INTEGRATING 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-ordinating 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. N.Sudha Bhuvaneshwari and S.Sujatha, **Integrating SOA and Web Services**, River Publishers Series in Information Science and Technology, Denmark, First Edition, 2012.

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BT-32
2018-19

Subject Code :

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

BCA

Effective from the academic year: 2018-2019

FIFTH SEMESTER

ELECTIVE I: 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, infrastructure and virtualization.

UNIT I

(10 Hrs)

First Drive: Introduction-Essentials-Benefits- 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. Dr.Kumar Saurabh, **Cloud Computing**, Wiley India, 2nd Edition, 2012 Reprint.

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
FIFTH SEMESTER

ELECTIVE I: MICROPROCESSOR AND ASSEMBLY LANGUAGE
PROGRAMMING

Objective of the Subject: The overall objective of this paper is to make students understand the basic components of 8086 & 8088 instruction set architecture, inspect and modify 8086 processor registers and memory.

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.

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.

TEXT BOOK

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.

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2018-19

Subject Code :

**Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA**

**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, 2007.
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, 2005.

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2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE – 14
BCA
Effective from the academic year: 2018-2019
SIXTH 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.

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Subject Code :

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.

Sy.

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2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

CORE: MOBILE APPLICATION DEVELOPMENT

Objective of the subject: This paper deals with the Mobile Application Development in Android Operating System. The students will learn the User Interface design, the basic activities, creating the interfaces and Messaging.

UNIT I (10 Hrs)

Getting Started with Android Programming: Android - Obtaining the Required Tools – Creating the First Android Application - Anatomy of an Android Application.

UNIT I (10 Hrs)

Activities, Fragments and Intents: Understanding Activities - Linking Activities Using Intents - Calling Built-in Applications Using Intents - Displaying Notifications.

UNIT I (10 Hrs)

Getting to know the Android User Interface: Understanding the Components of a Screen - Adapting to display Orientation - Managing Changes to Screen Orientation.

UNIT I (10 Hrs)

Designing Your User Interface with Views: Using Basic Views - Using Picker Views - Using List Views to Display Long Lists. **Data Persistence:** Saving and Loading User Preferences - Persisting Data to Files – Creating and Using Databases. **Content Providers:** Using a Content Provider - Creating Your Own Content Provider - Using the Content Provider.

UNIT I (10 Hrs)

Messaging: SMS Messaging - Sending E-Mail. **Location-Based Services:** Displaying Maps - Getting Location Data.

TEXT BOOK

1. “Beginning ANDROID 4 Application Development” by Wei-Meng Lee, Wiley Publications, 2015 Edition.

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Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

CORE: MOBILE APPLICATION DEVELOPMENT LAB

Objective of the subject: To develop User Interfaces, Activities and Views in the Android Operating System. It also highlights the location identification, SMS Messaging and e-mail.

Implementation of the following programs in ANDROID Operating System.

1. Write a program to implement the Activities.
2. Write a program to implement the Intent Filters.
3. Write a program to implement the User Interface.
4. Write a program to implement the Image Views.
5. Write a program to create a database to store the values.
6. Write a program to store the data in SD Card.
7. Write a program to implement the Content Providers.
8. Write a program to implement the SMS Messaging.



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Subject Code :

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Effective from the academic year: 2018-2019

SIXTH SEMESTER

ELECTIVE II - CLIENT/SERVER TECHNOLOGY

Objective of the subject: This subject helps in understanding the concepts and mechanisms of Client Server, Peer-to-Peer communications, Client/Server groupware, Client/Server Transaction Processing.

UNIT I (7 Hrs)

Client Server Computing – What is Client/Server – File servers - Database servers - Transaction servers - Groupware servers - Object servers - Web servers – FAT servers - Client/Server building blocks.

UNIT II (8 Hrs)

Clients, Servers and Operating Systems – The Anatomy of a Server Program – Needs of Client/Server from an OS – Server Scalability – Client Anatomy – Client Server hybrids. NOS: Creating the single system image.

UNIT III (12 Hrs)

Peer-to-Peer communications – Remote Procedure Call (RPC) – Messaging and Queuing: The MOM Middleware – MOM Vs RPC -SQL Database Servers – Fundamentals of SQL and Relational Databases – What does a Database servers do – Stored procedures - Triggers and rules.

UNIT IV (13 Hrs)

Datawarehouses – Online Transaction Processing (OLTP) - Decision Support Systems (DSS) – Executive Information System (EIS). Client/Server Transaction Processing – The ACID properties – Transaction Models – TP Monitors – Transaction Managements Standards.

UNIT V (10 Hrs)

Client/Server groupware – Importance of groupware – About groupware – The components of groupware. Distributed objects and components – promise of distributed objects – From distributed objects to component – 3-Tier Client/Server, object style

TEXT BOOK

1. The Essential Client/Server Survival Guide, Robert Orfali, Dan Harkey, Jerri Edwards, Galgotia Publications Pvt. Ltd., Second edition, 2009

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2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

ELECTIVE II PARALLEL COMPUTING

Objective of the subject: This paper gives an overview of the parallel architectures, convergence of architectures, parallelization process, design issues, scaling machines and Cache coherence.

UNIT I (10 Hrs)

Introduction: Application Trends-Technology Trends-Architectural Trends-Super Computers.

UNIT II (10 Hrs)

Convergence of Parallel Architectures-Fundamental Design Issues-Parallel Application case studies.

UNIT III (10 Hrs)

Parallelization Process – Partitioning for Performance – Performance Factors. Implications for programming Models.

UNIT IV (10 Hrs)

Scaling Workloads and Machines – Basic Measures of Multiprocessor Performance- Key Issues in Scaling – Scaling Models and Speed up Measures. Evaluating A Real Machine – Choosing workloads.

UNIT V (10 Hrs)

Directory Based Cache Coherence- Scalable Cache – Directory Based Approaches – Directory Protocols and tradeoffs- Design Challenges for Directory Protocols.

TEXT BOOK

1. Parallel Computer Architecture : A Hardware/Software Approach , David.E.Culler, Jaswinder Pal Singh, Anoop Gupta, Morgan Kaufmann Publishers, First Edition, 2002.

dy.

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2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

ELECTIVE II – MOBILE COMMUNICATIONS

Objective of the subject: This paper orients wireless communication, Tele-communication systems, broadcast systems and Mobile IP.

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-Protocol architecture. Satellite systems – Applications-Basics-GEO-LEO-MEO-Routing-Localization-Handover.

UNIT III (10 Hrs)
Broadcast systems – Overview-Cyclical repetition of data-Digital audio broadcasting-Digital video broadcasting-Convergence of broadcasting and mobile communications. Wireless LAN- Introduction – Infrastructure and ad-hoc networks – IEEE 802.11- System architecture – Protocol architecture – Physical layer-Medium access control layer (Basic DFWMAC-DCF using CSMA/CA, MAC frames) –Bluetooth- User scenarios – Architecture.

UNIT IV (10 Hrs)
Mobile Network Layer - Mobile IP-Goals, assumptions and requirements-entities and terminology-IP Packet delivery-Agent Discovery-Registration-Tunneling and encapsulation-Optimizations-Reverse tunneling-IPV6-IP micro-Mobility support. Mobile Transport Layer – Traditional TCP – Congestion control-Slow start-Fast retransmit-Implications of mobility-Classical TCP improvements-Indirect TCP-Snooping TCP-Mobile TCP-Fast retransmit/fast recovery-Transmission/time-out freezing-Selective retransmission-Transaction oriented TCP.

UNIT V (10 Hrs)
Support for Mobility – File systems – World Wide Web-HTTP-HTML-System architecture – Wireless application protocol (Architecture, Wireless datagram protocol, Wireless application environment, Wireless markup language) - imode technology.

TEXT BOOK

1. **Mobile Communications**, J. Schiller, Addison Wesley, Second Edition, 2011.

dy.

BI-42
2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

ELECTIVE II- NETWORK SECURITY

Objective of the subject: This course content covers various risks involved with network computers. Topics like cryptographic algorithms, keys, architectures for implementing network security tools and techniques for protecting the network data are discussed.

UNIT I (10 Hrs)
Computer Security Concepts- Security Attacks- Security Services- Security Mechanisms- A Model for Networking Security- Symmetric Encryption Principles- Cryptography- Cryptanalysis- Feistel Cipher Structure.

UNIT II (10 Hrs)
Public-Key Cryptography- Approaches to Message Authentication- Secure Hash Functions- Message Authentication Codes- Public-Key Cryptography Principles- Digital Signatures.

UNIT III (10 Hrs)
Network Security Applications- Key Distribution and User Authentication- Symmetric Key Distribution Using Symmetric Encryption- Key Distribution Using Asymmetric Encryption- Public-Key Infrastructure- Federated Identity Management.

UNIT IV (10 Hrs)
Wireless Network Security- IEEE 802.11 Wireless LAN Overview- IEEE 802.11i Wireless LAN Security- IEEE 802.11i Services- IEEE 802.11i Phases of Operations. IP Security- IP Security Overview- IP Security Policy.

UNIT V (10 Hrs)
System Security- Intruders- Intrusion Techniques- Intrusion Detection- Firewalls- Need for Firewalls- Firewall Characteristics- Types of Firewalls- Firewall Location and Configurations.

TEXT BOOK

1. Network Security Essentials (Application & Standard), William Stallings, Pearson Education, Fourth Edition, 2013.

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Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

ELECTIVE II - BIOINFORMATICS

Objective of the subject: The objective of this subject is to bring in the knowledge about Bioinformatics, Biological Databases, Phylogenetic Analysis and Molecular Visualization.

UNIT I (10 Hrs)
Introduction to Bioinformatics, History and Definition, Data Management and Analysis, Information Search and Data Retrieval. General Applications of Bioinformatics.

UNIT II (10 Hrs)
Introduction to Biological Databases. Types of Biological Databases and their importance, Functions, Sequence Database, Structure Databases, Nucleic Acid Databases, Protein Database, Specialized Database.

UNIT III (10 Hrs)
Biological Databases : Need for Sequence Analysis. Pairwise Alignment: Dayhoff PAM1, PAM 250 Matrices, BLOSUM Scoring Matrix. Global alignment: Needleman-Wunsch Algorithm. Local alignment: Smith-Waterman Algorithm and Substitution Matrix. Multiple Sequence Alignment: BLAST and FASTA Algorithms and their uses.

UNIT IV (10 Hrs)
Phylogenetic Analysis: Basic Principles of Phylogenetic Analysis. Building Phylogenetic Trees, Bootstrapping, Phylogenetic Software: ClustalW, ClustalX.

UNIT V (10 Hrs)
Molecular Visualization, Importance of Molecular Visualization. Tools: RasMol, QMol, Swiss PDB Viewer utilities.

TEXT BOOKS

1. Proteomics and Drug Discovery, S.C.Rastogi, Genomics, Prentice Hall of India Pvt. Limited, 2004
2. Introduction to Bioinformatics, Attwood and Parry Smith, Prentice Hall of India Pvt. Limited, 2005

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2018-19

Subject Code :

Dr. G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
BCA
Effective from the academic year: 2018-19
SIXTH SEMESTER

ELECTIVE II - INFORMATION SECURITY

Objective of the Subject: This paper covers the concepts regarding to Security in Computing, network and software.

- 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)
Language-based security: Analysis of code for security errors, safe languages, and sand boxing techniques. 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.Charles P Pfleeger and Shari Lawrence Pfleeger,; Security in Computing”, Fifth Edition, Prentice Hall, 2015.
- 2.Ross j. Anderson and Ross Anderson, ”Security Engineering: A Guide to Building Dependable Distributed Systems”, Willey,2001.
- 3.Debby Russell and Sr.G.T.Gangemi, ”Computer Security Basics(Paperback)”,2nd edition,O’Reilly Media,2006.
- 4.Thomas R. Peltier and John Blackley, ”Information Security Fundamentals:2nd Edition, Prentice Hall,1996.

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BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

ELECTIVE II: 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.

UNIT IV (10 Hrs)

VBScript Procedures – type casting variables - math functions –date functions – string functions- –other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object.

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. Simon Cozens, Beginning Perl, Wrox Press Ltd, 2000.

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Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
Effective from the academic year: 2018-2019
SIXTH SEMESTER

ELECTIVE II: 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.

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2018-19

Subject Code :

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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BI-48
2018-19

Subject Code :

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE - 14
BCA
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, Oral 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 – Article Rewriting – Plagiarism Checking.

TEXT BOOKS

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