ADHIYAMAAN COLLEGE OF ENGINEERING

(An Autonomous Institution, Affiliated to Anna University, Chennai)
Dr.M.G.R Nagar, Hosur-635109,
Tamilnadu,
India
www.adhiyamaan.ac.in

CURRICULAM AND SYLLABI for Regulation - 2020

Department of MCA

Adhiyamaan College of Engineering, (Autonomous)

Hosur-635130

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

Content

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Vision

To enhance and extend educational and research services effectively to the satisfaction of industry, parents, and society.

Mission

To module, the students acceptable to the corporate world, by grooming the students with better moral and ethical values.

Objectives

- To sustain 100% results in the End Assessment Examination.
- To place 80% of our students through placement every year and this should be gradually increased to 100% by 2030.
- To have industry collaboration with all leading software industries.
- To have academic collaboration with a leading research institution.
- To achieve sustainable growth towards the quality of education that aliens with the institutional quality policy.

Program Educational Objectives (PEOs)

PEO1. Applying Computing and Mathematical skill to identify, analyze, design, and develop a software application to meet the industry's needs.

PEO2. To prepare graduates who will achieve peer recognition as an individual or in teamwork, communication to possess innovative skills in the field of Global industries, research and upgrade their skills to become entrepreneurs.

PEO3. Prepare Graduates who will contribute to society as broadly educated, expressive ethical, and responsible citizens with proven expertise.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Program Outcomes (POs):

Upon completion of MCA degree, the graduates will be able to:

PO1.	Apply the knowledge of mathematics and computing fundamentals to various real life applications for any given requirement
PO2.	Design and develop applications to analyze and solve all computer science related problems
PO3.	Design applications for any desired needs with appropriate considerations for any specific need on societal and environmental aspects
PO4.	Analyze and review literatures to invoke the research skills to design, interpret and make inferences from the resulting data
PO5.	Integrate and apply efficiently the contemporary IT tools to all computer applications
PO6.	Solve and work with a professional context pertaining to ethics, social, cultural and cyber regulations
PO7.	Involve in perennial learning for a continued career development and progress as a computer professional
PO8.	Function effectively both as a team leader and team member on multi-disciplinary projects to demonstrate computing and management skills
PO9.	Communicate effectively and present technical information in oral and written reports
PO10.	Utilize the computing knowledge efficiently in projects with concern for societal, environmental, and cultural aspects
PO11.	Function competently as an individual and as a leader in multidisciplinary projects and create a path to be an entrepreneur
PO12.	Create and design innovative methodologies to solve complex problems for the betterment of the society

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Program Specific Outcomes (PSOs)

PSO1. **Programming Skills:** Ability to understand, analyze and develop an application based on multidisciplinary tools, technology, and language to meet the industry's requirements.

PSO2. **Professional Skills:** Ability to enhance the student's professional skills in terms of individual or teamwork related to IT industries

PSO3. **Entrepreneurship:** Ability to enhance their knowledge and create an innovative path to being an entrepreneur

Correlation of PEOs with POs and PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
PEO1	3	3	3	3	3	2	2	2	2	2	3	3	3	3	2
PEO2	2	2	2	2	3	2	3	3	2	2	3	3	2	2	2
PEO3	2	2	2	2	3	2	2	2	2	2	2	2	1	1	2

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

SEMESTER I

Table – I

Subject Code	Course Title	L	T	P	C
Theory					
120CAT01	Data Structures and Algorithms	3	0	0	3
120CAT02	Python Programming	3	0	0	3
120CAT03	Operating System Concepts	3	0	0	3
120CAE--	Choice – 1 (Core Elective – I)				
120CAE--	Choice – 2 (Open Elective – I)				
Practical					
120CAP06	Python Programming Lab	0	0	3	2
120CAL--	Choice – 3 (Lab Elective – I)				
120CAL--	Choice – 4 (Lab Elective – I)				

Table – II

Group	Subject Code	Course Title	L	T	P	C
Core Elective - I						
A	120CAE01	Software Engineering	3	0	0	3
	120CAE02	Computer Networks	3	0	0	3
	120CAE03	Problem Solving Techniques	3	0	0	3
	120CAE04	Digital Fundamentals and Computer Organization	3	0	0	3
	120CAE05	Cyber Security	3	0	0	3
Open Elective - I						
B	120CAE06	Accounting and Financial Management	3	0	0	3
	120CAE07	Business Processes	3	0	0	3
	120CAE08	Numerical Methods and Discrete Structures	3	0	0	3
	120CAE09	Electronic Commerce	3	0	0	3
	120CAE10	Microprocessor and its Applications	3	0	0	3
Lab Elective - I						
C	120CAL01	Data Structures and Algorithms Lab	0	0	3	2
	120CAL02	Network Programming Lab	0	0	3	2
	120CAL03	Software Testing Lab	0	0	3	2
	120CAL04	Problem Solving Techniques Lab using C	0	0	3	2
	120CAL05	Financial Management Lab	0	0	3	2

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

BRIDGE COURSE FOR SEMESTER I

Subject Code	Course Title	L	T	P	C
Theory					
120CAB001	Fundamentals Of Computing And Programming -I	3	0	0	0
Practical					
120CBP001	Fundamentals Of Computing And Programming Lab – I	0	0	3	0

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

SEMESTER II

Table – I

Subject Code	Course Title	L	T	P	C
	Theory				
220CAT01	Database Management Systems	3	0	0	3
220CAT02	Object Oriented Programming using Java	3	0	0	3
220CAT03	Cloud Computing	3	0	0	3
220CAE--	Choice – 5 (Core Elective – II)				
220CAE--	Choice – 6 (Open Elective - II)				
	Practical				
220CAP06	Database Management Systems Lab	0	0	3	2
220CAL--	Choice – 7 (Lab Elective – II)				
220CAL--	Choice – 8 (Lab Elective – II)				

Table – II

Group	Subject Code	Course Title	L	T	P	C
		Core Elective - II				
A	220CAE01	C# and Dot Net Programming	3	0	0	3
	220CAE02	Artificial Intelligence	3	0	0	3
	220CAE03	Block Chain Technology	3	0	0	3
	220CAE04	Mobile Computing	3	0	0	3
	220CAE05	Data Mining and Data Warehousing	3	0	0	3
		Open Elective - II				
B	220CAE06	Digital Marketing	3	0	0	3
	220CAE07	Probability and Statistical Methods	3	0	0	3
	220CAE08	Organizational Behaviour	3	0	0	3
	220CAE09	Embedded Systems	3	0	0	3
	220CAE10	Environmental Science and Disaster Management	3	0	0	3
		Lab Elective - II				
C	220CAL01	Java Programming Lab	0	0	3	2
	220CAL02	Cloud Computing Lab	0	0	3	2
	220CAL03	C# and Dot Net Programming Lab	0	0	3	2
	220CAL04	Image Processing Lab	0	0	3	2
	220CAL05	Data Mining and Data Warehousing Lab	0	0	3	2

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

BRIDGE COURSE FOR SEMESTER II

Subject Code	Course Title	L	T	P	C
Theory					
220CAB001	Fundamentals Of Computing And Programming -II	3	0	0	0
Practical					
220CBP001	Fundamentals Of Computing And Programming Lab – II	0	0	3	0

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

SEMESTER III

Table – I

Subject Code	Course Title	L	T	P	C
Theory					
320CAT01	Web Programming	3	0	0	3
320CAT02	Mobile Application Development	3	0	0	3
320CAT03	Big Data Management	3	0	0	3
320CAE--	Choice – 9 (Core Elective – III)				
320CAE--	Choice – 10 (Open Elective - III)				
Practical					
320CAP06	Mini Project	0	0	3	2
320CAL--	Choice – 11 (Lab Elective – III)				
320CAL--	Choice–12 (Employability Enhancement Course)				

Table – II

Group	Subject Code	Course Title	L	T	P	C
Core Elective - III						
A	320CAE01	Service Oriented Architecture	3	0	0	3
	320CAE02	Advanced Java Scripting Language	3	0	0	3
	320CAE03	Agile Software Development	3	0	0	3
	320CAE04	Machine Learning Techniques	3	0	0	3
	320CAE05	Internet of Things	3	0	0	3
Open Elective - III						
B	320CAE06	Professional Communication	3	0	0	3
	320CAE07	Resource Management Techniques	3	0	0	3
	320CAE08	Ad hoc and Sensor Networks	3	0	0	3
	320CAE09	Human Resource Management	3	0	0	3
	320CAE10	Financial Derivatives	3	0	0	3
Lab Elective - III						
C	320CAL01	Web Programming Lab	0	0	3	2
	320CAL02	Mobile Application Development Lab	0	0	3	2
	320CAL03	Machine Learning Techniques Lab	0	0	3	2
Employability Enhancement Course						
D	320CAL04	Executive Communication Lab	0	0	3	2
	320CAL05	Report Writing Practice Lab	0	0	3	2

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

SEMESTER IV

Table – I

Subject Code	Course Title	L	T	P	C
Employability Enhancement Course					
420CAP01	Project Work	0	0	35	15

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAT01 - DATA STRUCTURES AND ALGORITHMS

Objectives:

- To teach efficient storage mechanisms of data for an easy access.
- To design and implementation of various basic and advanced data structures.
- To introduce various techniques for representation of the data in the real world.
- To develop application using data structures.
- To teach the concept of protection and management of data
- To improve the logical ability

UNIT - I LINEAR DATA STRUCTURES 9

Introduction - Abstract Data Types (ADT) – Arrays and its representation –Structures – Stack – Queue– Circular Queue - Applications of stack – Infix to postfix conversion – evaluation of expression –Applications of Queue - Linked Lists – Doubly Linked lists – Applications of linked list – Polynomial Addition

UNIT - II TREE STRUCTURES 9

Need for non-linear structures – Trees and its representation – Binary Tree – expression trees – Binary tree traversals – left child right sibling data structures for general trees – applications of trees –Huffman Algorithm - Binary search tree.

UNIT - III BALANCED SEARCH TREES, SORTING AND INDEXING 9

AVL trees –B-Trees - Sorting – Bubble sort - Quick Sort - Insertion Sort – Heap sort – Hashing -Hashing functions - Collision Resolution Techniques - Separate chaining - Open addressing – Multiple hashing.

UNIT - IV GRAPHS 9

Definitions – Representation of graph - Graph Traversals - Depth-first traversal – breadth-first traversal - applications of graphs - Topological sort – shortest-path algorithms – minimum spanning tree – Prim's and Kruskal's algorithms – biconnectivity – Euler circuits.

UNIT – V ALGORITHM DESIGN AND ANALYSIS 9

Algorithm Analysis – Asymptotic Notations - Divide and Conquer – Merge Sort – Binary Search - Greedy Algorithms – Knapsack Problem – Dynamic Programming – Warshall's Algorithm for Finding Transitive Closure – Backtracking – Sum of Subset Problem – Branch and Bound – Travelling Salesman Problem.

Total No. of Periods: 45

Course Outcomes:

CO1. Student will be able to choose appropriate data structure as applied to specified problem definition

CO2. Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

CO3. Students will be able to apply concepts learned in various domains like DBMS, compiler construction etc.

CO4. Students will be able to use linear and non-linear data structures like stacks, queues, linked list etc.

CO5. Students will be able to analysis the various algorithms.

REFERENCE BOOKS

1. M. A. Weiss, “Data Structures and Algorithm Analysis in C++”, Pearson Education Asia, 2013.
2. Tanaenbaum A.S.,Langram Y. Augestein M.J “ Data Structures using C” Pearson Education , 2004.
3. Anany Levitin “Introduction to the Design and Analysis of Algorithms” Pearson Education 2003.
4. E. Horowitz, S.Sahni and Dinesh Mehta, “Fundamentals of Data structures in C++”, University Press, 2007.
5. E. Horowitz, S. Sahni and S. Rajasekaran, “Computer Algorithms/C++”, Second Edition, University Press, 2007.
6. Reema Thareja, “Data Structures using C”, Oxford Press, 2012.
7. V. Aho, J. E. Hopcroft, and J. D. Ullman, “Data Structures and Algorithms”, Pearson Education, 1983.
8. T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, "Introduction to algorithms", Second Edition.

Course Name	CO’S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAT01 - DATA STRUCTURES AND ALGORITHMS	CO1	3	2										
	CO2		2		2	3					2		
	CO3	3	2			2							
	CO4	3	2		2								
	CO5	3	3	2	2								
AVERAGE		**3.00**	**2.2**	**2.00**	**2.00**	**2.5**					**2.00**		

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAT02 – PYTHON PROGRAMMING

Objectives:

- To know the basics of algorithmic problem solving
- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures –- lists, tuples, dictionaries.
- To do input/output with files in Python.

UNIT - I DATA, EXPRESSIONS, STATEMENTS 9

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT - II CONTROL FLOW, FUNCTIONS 9

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT - III LISTS, TUPLES, DICTIONARIES 9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: selection sort, insertion sort, merge sort, histogram.

UNIT - IV FILES, MODULES, PACKAGES 9

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

UNIT - V OOC AND DB INTEGRATION IN PYTHON 9

Python Basics - Introduction to OOC – Classes and Instances – Static and Class Methods – Composition – Inheritance – Built-in Functions – Integrated Web Applications in Python - Python and MySQL Database Integration: Connect Database – Create and Insert Operations – Parameter Passing – Retrieving data from Database. Case Study on SciPy, Django, Open CV.

Total No. of Hours: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes:

CO1. Develop algorithmic solutions to simple computational problems
CO2. Read, write, execute by hand simple Python programs.
CO3. Structure simple Python programs for solving problems.
CO4. Represent compound data using Python lists, tuples, dictionaries.
CO5. Read and write data from/to files in Python Programs.

REFERENCES

1. Fabrizio Romano,"Learn Python Programming", Second Edition, Paktr Publication, 2018
2. Ashok Namdev Kamthane, Amit Ashok Kamthane,"Python programming", McGraw Hill Publication,2018
3. Brian Draper, "Python Programming -A Complete Guide for Beginners to Master and Become an Expert in Python Programming Language", CreateSpace Independent Publishing Platform,2016
4. John M. Stewart, "Python for Scientists", Cambridge University Press, 2015.
5. Mitch Garnaat, "Python and AWS Cookbook", First Edition, O'Reilly Media, Inc., 2012.
6. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016
7. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAT02 – PYTHON PROGRAMMING	CO1	3	2	3									2
	CO2	3	2		3		2						
	CO3		2	3	2		2						
	CO4	3	2		3		2						
	CO5	3	2	3			2						
AVERAGE		**3.00**	**2.00**	**3.00**	**2.67**		**2.00**						**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAT03 - OPERATING SYSTEM CONCEPTS

Objectives:

- To learn the fundamentals of Operating Systems.
- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporary OS
- To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
- To know the components and management aspects of concurrency management
- To learn programmatically to implement simple OS mechanisms

UNIT - I OPERATING SYSTEM AND PROCESS MANAGEMENT 9

Introduction - System Components - Operating System Services - System Calls - System Programs - Process Concept - Process Scheduling – Operations on Process - Cooperation Process - Inter-process Communication - CPU Scheduling and criteria - Scheduling Algorithms - Multiple-Processor Scheduling - Real Time Scheduling.

UNIT - II CRITICAL SECTION AND DEADLOCKS 9

The Critical-Section Problem - Synchronization Hardware – Semaphores - Classic problems of Synchronization - Critical regions – Monitors. System Model – Deadlock Characterization – Methods for handling Deadlocks – Deadlocks Prevention and Avoidance – Deadlock Detection and Recovery.

UNIT - III STORAGE MANAGEMENT 9

Memory Management – Swapping – Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging - Virtual Memory – Demand Paging – Process Creation – Page Replacement – Allocation of frames – Thrashing.

UNIT – IV FILE SYSTEMSINTERFACE AND IMPLEMENTATION 9

File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection. File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems – Disk Structure – Disk Scheduling – Disk Management – Swap – Space Management.

UNIT - V WINDOWS ARCHITECTURE 9

Design Goals – System Architecture – System Management Mechanisms – Process and Thread Management – Memory Management – File Systems Management – Input/Output Management – Interprocess Communication. Case Study: Linux – Mobile OS

Total No. of Periods : 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes:

CO1. Analyze the structure of OS and basic architectural components involved in OS design.
CO2. Analyze and design the applications to run in parallel either using process or thread models of different OS
CO3. Analyze the various device and resource management techniques for timesharing and distributed systems
CO4. Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
CO5. Interpret the mechanisms adopted for file sharing in distributed Applications

REFERENCES

1. Abraham Silberschatz, Greg Gagne, Peter B. Galvin, "Operating System Concepts", Eight Edition, Wiley Publication, 2019
2. Ekta. Walia, Ekta,"Operating System Concepts", Khanna Book Publishing Company (P) Limited,2015
3. Harvey M. Deitel, Paul J. Deitel and David R. Choffnes, "Operating System", Third Edition, Pearson, 2013.
4. William Stalling, "Operating Systems Internals and Design Principles", Fifth Edition, Prentice Hall of India, 2005.
5. Andrew S. Tanenbaum, "Modern Operating Systems", Third Edition, PHI, 2008.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAT03 - OPERATING SYSTEM CONCEPTS	CO1		3		2								
	CO2		3		2								
	CO3		3		2								
	CO4					3							
	CO5					3							3
AVERAGE			**3.00**		**2.00**	**3.00**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

120CAP06 – PYTHON PROGRAMMING LAB

Course Objectives

- To Understand fundamental statement of python programming
- To enable knowledge of Dictionaries and tuples
- Practice of an Exception Handling
- Ability to gain knowledge on Inheritance
- To Deploy web application with MySQL Database

LIST OF EXPERIMENTS

1. Write a python program to implement a module to find distance between two points
2. Develop a user defined function to exchange the value of two variables.
3. Write a python program to implement any five string functions.
4. Python Program to develop a fruitful function.
5. Implement a python program with tuples
6. Write a python program to use Dictionaries with appropriate data.
7. Implement file concept with various operation
8. Practice Exception handling in python
9. Design and develop a python program using Inheritance.
10. Integrate Web Application in Python Using MySQL Database.

Total No. of Periods: 45

Course Outcome

CO1. Getting Practice with decision and branching statement
CO2. Knowledge about dictionaries and tuples
CO3. Create an exception handling application with inheritance
CO4. Able to develop a web application with MySQL database

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAP06 – PYTHON PROGRAMMING LAB	CO1	3											
	CO2				3								
	CO3												3
	CO4					3							
AVERAGE		**3.00**			**3.00**	**3.00**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE01 - SOFTWARE ENGINEERING

Objectives:

- To provide an insight into the processes of software development.
- To understand and practice the various fields such as analysis, design, development, testing of software engineering.
- To develop skills to construct software of high quality with high reliability.

UNIT - I SOFTWARE PROCESS 9

Introduction–Nature of Software-Software Engineering and Practice-Software Process-Software Myths. Generic Process Model – Prescriptive Process Models – Waterfall - Incremental – Evolutionary- Concurrent Models. Specialized Process Models -Component Based Development - Formal Methods - Aspect Oriented Software Development - The Unified Process – Agile Software development Model - Verification - Validation - Systems Engineering – Organizations, People and Computer Systems.

UNIT - II SOFTWARE REQUIREMENTS 9

Functional Requirements - Non Functional Requirements - User Requirements – System Requirements - Requirements Engineering -Establishing the Groundwork – Requirements Elicitation – Building the Requirements Model - Negotiating and Validating Requirements. Software Prototyping – User Interface Prototyping. Analysis and Modeling - Requirement Analysis - Scenario Based Modeling – Data Modeling Concepts - Class Based Modeling.

UNIT - III DESIGN CONCEPTS AND ARCHITECTURAL DESIGN 9

Design Process – Design Concepts and Design Models. Architectural Design - Software Architecture – Architectural Styles – Architectural Design – Assessing Alternative Architectural Design - Architectural Mapping Using Data Flow.

UNIT- IV COMPONENT LEVEL AND USER INTERFACE DESIGN 9

Component Level Design – Introduction to Component - Designing Class Based Components - Conducting Component Level Design - User Interface Design – The Golden Rules - User Interface Analysis and design. Real Time Software Design – System Design – Real Time Operating System-Data Acquisition System – Monitoring and Control System-Introduction to SCM.

UNIT – V SOFTWARE TESTING 9

Software Testing Fundamentals –White Box Testing – Basis Path Testing –Control Structure Testing - Block box Testing. S/W Testing Strategies – Strategic Approach to Software Testing– Test Strategic for conventional Software - Unit Testing - Integration Testing – Validation Testing – System Testing.

Total No. of Periods : 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes:

- **CO1.** Get an insight into the processes of software development.
- **CO2.** Understand the problem domain for developing SRS and various models of software engineering.
- **CO3.** Model software projects into high level design using DFD, UML diagrams.
- **CO4.** Measure the process performance using various metrics
- **CO5.** Implementation of testing strategies.

REFERENCES

1. Bruce R. Maxim, Dr., Roger S. Pressman, "Software Engineering: A Practitioner's Approach", McGraw-Hill Education, 2019
2. James K. L, "Software Engineering", Second Edition, PHI Publications, 2016
3. James S Peters and WitoldPedryez, "Software Engineering – An Engineering Approach" John Wiley and Sons, New Delhi, 2009.
4. Hans and Van Vilet," Software Engineering Principles and Practice", John Wiley and Sons, 3rd edition 2008

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE01 - SOFTWARE ENGINEERING	CO1		3			3	2						
	CO2	3			3		2						
	CO3				3			3					
	CO4	3											
	CO5	3	3	2									
AVERAGE		**3.00**	**3.00**	**2.00**	**3.00**	**3.00**	**2.00**	**3.00**					

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE02 - COMPUTER NETWORKS

Objectives:

- To provide insight about networks, topologies, and gain comprehensive knowledge about the layered communication architectures (OSI and TCP/IP) and its functionalities.
- To understand the principles, key protocols, design issues, and significance of each layers in ISO and TCP/IP.
- To know the basic concepts of network security and its various security issues related with each layer.

UNIT - I DATA COMMUNICATION 9

Data Communication – Networks - Protocols and Standards – Network Models – Layers in the OSI model – TCP/IP Protocol Suite – Addressing – Transmission Modes – Transmission Media Telephone Network – Dial-Up Modems – Digital Subscriber Line – Cable TV Networks – Cable TV for Data Transfer.

UNIT - II DATA LINK LAYER 9

Error Detection and Error Correction – Data Link Control – Wired LANs: Ethernet – Wireless LANs – SONETISDH.

UNIT - III NETWORK LAYER 9

Internetworking – Ipv4 – Ipv6 – Transition from IPv4 to IPv6 – Address Mapping –ICMP – IGMP – ICMPv6 – Delivery- Forwarding – Routing.

UNIT - IV TRANSPORT LAYER 9

Process-to-Process Delivery – User Datagram Protocol – TCP – SCTP – Data Traffic – Congestion and its Control – Quality of Service – Improve QoS – Integrated Services – QoS in Switched Networks.

UNIT - V APPLICATION LAYER 9

Domain Name System – Remote Logging – Electronic Mail – File Transfer – WWW and HTTP – Simple Network Management Protocol – Cryptography – Symmetric-Key and Asymmetric-Key Cryptography – Security Service – Message Confidentiality, Integrity and Authentication – IPSec – SSL – PGP – Firewall.

Total Number of Periods: 45

Course Outcomes:

CO1. Knowledge of basic network theory and layered communication architectures.
CO2. To understand wired and wireless LAN.
CO3. Ability to design network topologies.
CO4. Ability to solve problems in networking.
CO5. To understand the basic concept of application layer.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Gerry Howser, “Computer Networks and the Internet: A Hands-On Approach", Springer Publication, 2019
2. Oliver C. Ibe, “Fundamentals of Data Communication Networks”, Wiley Publication, 2017
3. Behrouz A. Forouzan, “Data Communication and Networking”, 4th Edition, McGraw-Hill, 2007.
4. Behrouz A. Forouzan and Firouz Mosharraf, “Computer Networking: A Top-Down Approach”, McGraw-Hill, 2013.
5. Andrew S. Tannenbaum and David J. Wetherall, “Computer Networks”, Pearson, 2013.
6. William Stallings, “Data and Computer Communications”, 8th Edition, Pearson, 2012.
7. Larry L. Peterson & Bruce S. Davie, “Computer Networks – A systems Approach”, 5th Edition, 2012.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE02 - COMPUTER NETWORKS	CO1	3				3	2						
	CO2	3											
	CO3		3										
	CO4			3									
	CO5					3							
AVERAGE		**3.00**	**3.00**	**3.00**		**3.00**	**2.00**						

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE03 - PROBLEM SOLVING TECHNIQUES

Objectives:

- To understand the basic concepts of problem solving approaches and develop optimal program structure using conditional and iterative control structures and functions.
- To design, implement, test, and apply the basic C programming concepts.
- Apply the techniques of structured (functional) decomposition to break a program in to smaller pieces and describe the mechanics of parameter passing

UNIT – I INTRODUCTION TO COMPUTER PROBLEM-SOLVING 9

Introduction – The Problem-Solving Aspect – Top-down Design-Implementation of Algorithms-Program Verification – The Efficiency of Algorithms. Fundamental Algorithms – Exchanging the values of two variables – Counting – Summation of a set of Numbers – Factorial Computation – Sine Function Computation – Generation of the Fibonacci sequence – Reversing the Digits of an Integer – Base Conversion Character to Number Conversion.

UNIT – III FACTORING METHODS 9

Finding the Square Root of a Number – The Smallest Divisor of an Integer – The Greatest Common Divisor of Two Integers – Generating Prime Numbers – Computing the Prime Factors of an Integer – Generation of Pseudo – Random Numbers – Raising a Number to a Large Power – Computing the nth Fibonacci Number.

UNIT – IV SORTING AND SEARCHING 9

The Two- Way Merge – Sorting by Selection – Sorting by Exchange – Sorting by Insertion – Sorting by Diminishing Increment – Sorting by Partitioning – Binary Search – Hash Searching.

UNIT – V TEXT PROCESSING AND PATTERN SEARCHING 9

Text Line Length Adjustment – Left and Right Justification of Text – Keyword Searching in Text – Text Line editing – Linear Pattern Search – Sub Linear Pattern Search.

Total No. of Periods: 45

Course Outcomes:

CO1. Able to design a computational solution for given problem
CO2. Able to break a problem in to modules that can be solved
CO3. Able to transform a problem into program
CO4. Able to introduce modularity
CO5. To implement the text processing and pattern searching.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. David a Freitag,"Programming and Problem Solving an Introduction to Computer Science", Independently Published, 2019
2. Maureen Sprankle, Jim Hubbard, "Problem Solving & Programming Concepts", Pearson Education Limited,2014
3. R.G.Dromey, “How to solve it by Computer”, Pearson Education, India, 2009.
4. J.R.Hanly and E.B.Koffman, “Problem Solving and Program Design in C”, 5th Edition 2009, Pearson Education.
5. Maureen Sprankle,”Problem Solving and Programming Concepts”, 7th Edition, Pearson Education 2008.
6. Robert L. Segesta,” Concepts of Programming Languages”, 10th Ed. Pearson Education, 2012.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE03 - PROBLEM SOLVING TECHNIQUES	CO1		3	2									
	CO2	3			3								
	CO3				2								
	CO4					2							
	CO5												3
AVERAGE		**3.00**	**3.00**	**2.00**	**2.5**	**2.00**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE04 - DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION

Objectives:

- To have a understanding of Digital systems and operation of a digital computer.
- To learn different architectures & organizations of memory systems, process or organization and control unit.
- To understand the working principles of multiprocessor and parallel organization's as advanced computer architectures

UNIT - I INTRODUCTION TO DIGITAL DESIGN 9

Data Representation - Data Types - Complements - Arithmetic Operations - Representations - Fixed Point, Floating Point , Error Detection Codes - Binary Codes - Logic Gates, Boolean Algebra, Map Simplification - Combinational Circuits: Half-Adder, Full-Adder- Flip Flops – Sequential Circuits.

UNIT - II DIGITAL COMPONENTS, REGISTERS TRANSFER & MICRO OPERATIONS 9

ICs - Decoders - Multiplexers - Registers - Shift Registers - Binary Counters - Memory Unit - Register Transfer Language - Register Transfer - Bus And Memory Transfers - Arithmetic, Logic And Shift Micro Operations , Arithmetic Logic Shift Unit.

UNIT - III COMPUTER ORGANIZATION AND PROGRAMMING 9

Instruction Codes - Computer Registers - Computer Instructions - Timing And Control – Instruction Cycle - Memory Reference Instructions - I/O And Interrupt – Machine Language – Assembly Language - Assembler - Program Loops – Programming Arithmetic and Logic Operations - Subroutines - I/O Programming.

UNIT - IV INPUT - OUTPUT ORGANIZATION 9

Peripheral Devices - Input-Output Interface - Asynchronous Data Transfer - Modes Of Transfer - Priority Interrupt - DMA - IOP - Serial Communication.

UNIT - V MEMORY ORGANIZATION AND CPU 9

Memory Hierarchy - Main Memory - Auxiliary Memory - Associative Memory - Cache Memory - Virtual Memory - Memory Management Hardware - CPU: General Register Organization – Control Word - Stack Organization - Instruction Format - Addressing Modes - Data Transfer And Manipulation - Program Control.

Total No. of Periods: 45

Course Outcomes:

- **CO1.** Design trade-offs Basic fundamentals in digital logic & structure of a digital computer
- **CO2.** Identify performance issues in processor and memory design of a digital computer.
- **CO3.** To Develop independent learning skills and be able to learn more about different computer architectures and hardware.
- **CO4.** To articulate design issues in the development of Multiprocessor organization & architecture.
- **CO5.** To identify the process of memory organization.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Ata Elahi,“ Computer Systems-Digital Design, Fundamentals of Computer Architecture and Assembly language”, Springer Publication, 2017.
2. Joseph D. Dumas, “Computer Architecture –Fundamentals and Principles of Computer Design”, CRC Press Publication, 2016
3. Ashok Arora, “Computer Fundamental and Applications”, Vikas Publication, 2015.
4. Nikrouz Faroughi, Digital Logic Design and Computer Organization with Computer Architecture for Security, McGraw-Hill Education,2014
5. Sarah Harris, David Harris, Digital Design and Computer Architecture ARM Edition, Elsevier Science, 2015.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE04 - DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION	CO1	3	3		3								
	CO2				3		3						
	CO3		3										
	CO4		3	3									
	CO5					3							
AVERAGE		**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**						

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE05 – CYBER SECURITY

Course Objectives

- To Understand the basic concept of symmetric chipper
- Apply block chipper and data encryption standard
- To gain knowledge of asymmetric chipper
- To determine cryptographic data integrity algorithm
- Understand network and internet security

UNIT – I INTRODUCTION TO SYMMETRIC CHIPERS 9

Overview – Computer Security Concept – Security Attacks – Security Services – Security Mechanism – Classical Encryption Techniques – Symmetric Cipher Model – Substitution Techniques – Transportation Techniques – Rotor Machines - Steganography

UNIT – II BLOCK CHIPHER AND DATA ENCRYPTION STANDARD 9

Block Cipher Principles – The Data Encryption Standard – DES Examples – The Strength of DES – Differential and Linear Cryptanalysis – Block Cipher Design Principles – The Origins of AES – AES Structure – AES Round Function – AES – Key Expansion – AES Implementation

UNIT – III ASYMMETRIC CHIPER 9

More Number Theory: Prime Numbers – Fermat and Euler's Theorem – Testing for Primality – The Chinese Remainder Theorem – Discrete Logarithms - Public –Key Cryptography and RSA: Principles of Public key Cryptosystems- The RSA Algorithm.

UNIT – IV CYPTOGRAPHIC DATA INTEGRITY ALGORITHMS 9

Cryptographic Hash Function – Application of Cryptographic Hash Function – Two Simple Hash Function – Requirements and Security – Hash Function Based on Cipher Block Chaining – Secure Hash Algorithm – SHA3 – Message Authentication Code.

UNIT – 5 NETWORK AND INTERNET SECURITY 9

Transport Level Security: Web Security Issues – Secure Socket Layer – Transport Layer Security – HTTPS – Secure Shell – Wireless Application Protocol – Wireless Transport Layer Security – WAP End-to End Security – Pretty Good Privacy – S/ MIME

Total No. of Periods : 45

Course Outcomes

CO1. Able to understand basic concept of symmetric chipper
CO2. Able to apply block chipper and data encryption standard
CO3. Implement asymmetric chipper
CO4. Getting practice with cryptographic data integrity algorithm
CO5. Understand network and internet security

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. William Stallings, "Cryptography and Network Security –Principles and Practices ", Prentice Hall, 5th Edition 2011.
2. Stallings, William. Effective Cybersecurity: A Guide to Using Best Practices and Standards. Addison-Wesley Professional, 2018.
3. Gupta, Brij, Dharma P. Agrawal, and Shingo Yamaguchi, eds. Handbook of research on modern cryptographic solutions for computer and cyber security. IGI global, 2016.
4. Jajodia, Sushil, Peng Liu, Vipin Swarup, and Cliff Wang. Cyber situational awareness. Springer US, 2009.
5. Gupta, Brij B., and Quan Z. Sheng, eds. Machine learning for computer and cyber security: principle, algorithms, and practices. CRC Press, 2019.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE05 – CYBER SECURITY	CO1	3			3								
	CO2					2							
	CO3	3											
	CO4						3						
	CO5							3					
AVERAGE		**3.00**			**3.00**	**2.00**	**3.00**	**3.00**					

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE06 - ACCOUNTING AND FINANCIAL MANAGEMENT

Course Objectives

- To understand the basic principles of Double entry system and preparation of balance sheet.
- To understand the process of estimating the cost of a particular product.
- To Prepare the estimate for various business activities such as purchase, sale, production and cash budgets.
- To ensure decision making process of an organization

UNIT – I INTRODUCTION TO ACCOUNTING 9

Meaning and Scope of Accounting – Principles – Concepts – Accounting Standards – Final Accounts –Trial Balance – Trading Account – Profit and Loss Account – Balance Sheet.

UNIT –II MARGINAL COSTING 9

Meaning – Objectives – Elements of Cost – Cost Sheet – Marginal Costing and Cost Volume Profit Analysis – Break Even Analysis – Applications – Limitations.

UNIT – III BUDGETS AND BUDGETING CONTROL 9

Budgets and Budgetary Control – Meaning – Types – Sales Budget – Production Budget – Cost of Production Budget – Flexible Budgeting – Cash Budget – Master Budget - Zero Base Budgeting.

UNIT– IV INVESTMENT DECISION AND COST CAPITAL 9

Time Value of Money Concepts – Capital Budgeting – Methods Of Appraisal – Cost of Capital Factors Affecting Cost of Capital – Computation for Each Source of Finance and Weighted Average Cost of Capital.

UNIT – V WORKING CAPITAL MANEGEMENT 9

Concepts of Working Capital – Working Capital Policies – Factors Affecting Working Capital – Estimation of Working Capital Requirements.

Total No. of Periods : 45

Course Outcomes:

CO1. To understand the balance sheet preparation and do analysis
CO2. To understand the budget preparation and control of a company
CO3. Helps to decide about the state of affairs of a particular firm / company.
CO4. Ensures the preparation of fiscal policies of the organization.
CO5. Ensures the factors to be considered in investment policies.

REFERENCES

1. Anutam Paul, “Financial Management”, McGraw Hill Publication, 2020.
2. Steven J. Peterson ,Construction Accounting and Financial Management, Pearson Education, 2019.
3. Len Holm, “Cost Accounting and Financial Management for Construction Project Managers”, CRC Press Publication, 2018.
4. Ravi M. Kishore, “Financial Management”, Taxman Publishers, 2013.
5. S.N.Maheshwari, “Financial and Management Accounting”, Sultan Chand & Sons, 2003.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE06 - ACCOUNTING AND FINANCIAL MANAGEMENT	CO1	3											
	CO2							2					
	CO3											3	
	CO4											3	
	CO5										2		
AVERAGE		**3.00**						**2.00**			**2.00**	**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE07 - BUSINESS PROCESSES

Course Objectives

- An organization must carefully analyze and document their business processes
- Continuously assess the efficiency and effectiveness of these processes to minimize cost and maximize value creation.
- Cognize the interactions between human behavior and process design.
- Managing Change in the Global Environment-BPR
- Organizational Frame Work and Implementation of business processes

UNIT 1: ORGANIZATIONAL STRUCTURE 9

Types of Business Organizations-Organizational Structures-Definition-Complexity-Formulization-Size-Technology-Culture-Forms and Outcomes-Explanations of Structures-IT Industry and Organizational Structures

UNIT 2: ORGANIZATIONAL OUTCOMES 9

Organizational Power and Power Outcomes-Leadership and Decision Making-Communication and Organizational Change-Organizational Environments and Effects-Inter and Intra organizational Relationships-Organizational Effectiveness

UNIT 3: BUSINESS PROCESS RE-ENGINEERING 9

Introduction to Business Process Re-engineering (BPR)-Meaning-Types-Process-Impetrative for Survival-Strategic Approach-Implementing Business Process Re-engineering-Methodology and Steps-Indian Scenario of Implementing BPR

UNIT 4: BPR AND IT INDUSTRY 9

BPR and Information Technology Process-People View and Perspectives-Empowering People through IT-Managing Change in the Global Environment-BPR Rediscovering Indian Paradigm-Need of Reengineering

UNIT 5: E-BUSINESS PROCESS 9

E-Business-Introduction-E-business vs. E-commerce-Execution of E-business-Trends-Design for Execution-Construction-Types-Organizational Frame Work and Implementation-E-business Application Areas(CRM,ERP,SCM and Selling)-E-business and India

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes:

CO1. Develop new or improved innovative business processes from gap analysis through process design in support of a company's strategic objectives in a socially responsible manner.
CO2. Analyze the key business processes that drive the value chain of an organization throughout the entire product life cycle.
CO3. Evaluate current global business issues and their impact on various enterprises.
CO4. BPR and Information Technology Process-People View and Perspectives
CO5. E-business Application in the areas of CRM,ERP,SCM and Selling

REFERENCES:

1. Richard H.Hall, Organizations-Structures, Processes and Outcomes", Pearson Education, 2015
2. M.S.Jayaraman et. Al, "Business Process Reengineering", Tata Mc Graw Hill Publications, 2015
3. Ravi Kalakota and Marcia Robinson, "E-Business; Roadmap for Success; Pearson Education, 2016
4. Gareth Jones, "Organizational Theory, Design and Change", Pearson Education, 4th Edition, 2017
5. Dave Chaffey, "E-business and E-Commerce" Pearson Education, 2nd Edition,2016

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE07 - BUSINESS PROCESSES	CO1		3	2									
	CO2					3							
	CO3	3					3						
	CO4					2						3	
	CO5								3				
AVERAGE		**3.00**	**3.00**	**2.00**		**2.5**	**3.00**		**3.00**			**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE08 - NUMERICAL METHODS AND DISCRETE STRUCTURES

Course objectives

- To solve equations using direct and iterative methods,
- To introduce interpolation techniques and to study the principle of numerical differentiation.
- To study the principle of numerical integration using interpolation.
- To understand the concept of logic and to master combinatorics which deals with the counting principles.
- To expose the basic properties and concepts of algebraic structures.

UNIT - I NUMERICAL INTEGRATION 9

Numerical Integration using Trapezoidal, Simpson's 1/3 and Simpson's 3/8 rules- Two point and three point Gaussian Quadrature formulae.

UNIT - II LOGIC AND COMBINATORICS 9

Propositional Logic – Propositional equivalences-Predicates and quantifiers – Nested Quantifiers – Rules of inference- Mathematical induction -The pigeonhole principle – Permutations and combinations – Recurrence relations- Solving linear recurrence relations-generating functions – Inclusion and exclusion and applications.

UNIT - III ALGEBRAIC STRUCTURES 9

Algebraic systems – Semi groups and monoids – Groups-Permutation-Subgroups - homomorphisms – Cyclic subgroups-- Cosets -Lagrange's theorem –Normal subgroups- Rings & Fields(basic definitions and problems)-Elementary properties of rings-Isomorphism-Typesof rings-Sub rings-Homomorphism of rings-Fields of quotients of an integral domain.

UNIT - IV SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9

Solution of algebraic and transcendental equations by Newton-Raphson Method- Solution of Linear System of Equations by direct methods - Gauss Elimination Method- Gauss-Jordan Method- Iterative Methods - Gauss-Jacobi and Gauss Seidel- Eigen values of a matrix by Power Method.

UNIT – V INTERPOLATION AND NUMERICAL DIFFERENTIATION 9

Interpolation with equal intervals- Newton's forward and backward difference formulae- Interpolation with unequal intervals- Lagrange Interpolation- Approximation of derivatives using interpolation polynomials.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes

CO1. Apply numerical methods such as direct and iterative methods to solve algebraic or transcendental equations and system of equations.
CO2. Appreciate numerical solutions using interpolation methods and approximation of derivatives.
CO3. Compute numerical solutions by integral calculus.
CO4. Expertise the knowledge of logics helps to verify the correctness of computer programs and to draw conclusions from scientific experiments.
CO5. Internalize the abstract algebraic structure concepts.

REFERENCES

1. Richard L.Burden , J.Dougles Faires and Annette M. Burden, "Numerical Analysis", Tenth Edition, Cengage, 2016.
2. Kenneth H.Rosen, "Discrete Mathematics and its Applications", 6th Edition, Special Indian edition ,
   Tata McGraw – Hill Pub. Co. Ltd., New Delhi, (2012).
3. Trembly J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 30th Re-print,2010.
4. T.Veerajan, "Discrete Mathematics" Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 2014.
5. Kandasamy.P., Thilagavathy.K. & Gunavathi.K., " Numerical Methods", S.Chand & Company Ltd.,New Delhi, 2013.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE08 - NUMERICAL METHODS AND DISCRETE STRUCTURES	CO1	3											
	CO2	3	3										
	CO3						3	2					
	CO4										3	3	
	CO5												3
AVERAGE		**3.00**	**3.00**				**3.00**	**2.00**			**3.00**	**3.00**	**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE09 - ELECTRONIC COMMERCE

Course objectives

- To make the students to understand the concepts of E – Commerce.
- Formation process of cryptographic applications.
- To help students to understand different types of Digital Currencies and Payment Systems.
- To enable students to implement, evaluate the Security Considerations and cyber cash payments.
- To provide students industry cases related to Microsoft Internet Servers.

UNIT – I INTRODUCTION 9

Overview of Developments in Information Technology and defining E – Commerce – Scope of E – Commerce – Electronic Market – Electronic Data Interchange – Internet Commerce – Benefits and Limitations of E – Commerce – Produce a Generic Framework for E – Commerce – Architectural framework of Electronic Commerce – Web based E – Commerce Architecture.

UNIT - II SECURITY TECHNOLOGIES 9

Why Internet Is Unsecure – Internet Security Holes – Cryptography: Objective – Codes and Ciphers – Breaking Encryption Schemes – Data Encryption Standard – Trusted Key Distribution and Verification – Cryptographic Applications – Encryption – Digital Signature – Non repudiation and Message Integrity.

UNIT - III ELECTRONIC PAYMENT METHODS 9

Traditional Transaction : Updating – Offline and Online Transactions – Secure Web Servers – Required Facilities – Digital Currencies and Payment Systems – Protocols for the Public Transport – Security Protocols – SET – Credit Card Business Basics.

UNIT - IV ELECTRONIC COMMERCE PROVIDERS 9

Online Commerce Options – Functions and Features – Payment Systems : Electronic, Digital and Virtual Internet Payment System – Account Setup and Costs – Virtual Transaction Process – InfoHaus – Security Considerations – Cyber Cash: Model – Security – Customer Protection – Client Application – Selling through Cyber Cash.

UNIT -V ONLINE COMMERCE ENVIRONMENTS 9

Servers and Commercial Environments – Payment Methods – Server Market Orientation – Netscape Commerce Server – Microsoft Internet Servers – Digital Currencies – Digi Cash – Using Ecash – Ecash Client Software and Implementation – Smart Cards - The Chip – Electronic Data Interchange – Internet Strategies, Techniques and Tools.

Total No. of periods: 45

Course Outcomes

CO1. Understand the e – Commerce process and its advantages
CO2. Realize the concepts of Electronic Data Interchange and its implications.
CO3. Ability to develop and to implement the Secure Web Servers.
CO4. Students would become acquainted with the Digital and Virtual Internet Payment System.
CO5. Practically become analytically skillful in Internet Strategies.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Jim Work George Brand,"E-Commerce Business Model 2020",Amazon Digital Services LLC,2020
2. Kenneth C. Laudon, Carol Guercio Traver, "E-Commerce 2020-2021",Pearson Education, 2020
3. Patrick Davis, "E-commerce Hacks 2020 How to Start a Successful E-Commerce Business in 2020", Independently Published, 2020
4. Pete LoshinJohn Vacca, "Electronic Commerce", 4th Edition, Firewall Media, An imprint of Laxmi Publications Pvt. Ltd., New Delhi, 2006.
5. Gary P. Schneider, "Electronic Commerce", 4th Edition, Thomson Course Technology, 2004.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE09 - ELECTRONIC COMMERCE	CO1										3		
	CO2				3								
	CO3					3							
	CO4					3						2	
	CO5	3											2
AVERAGE		**3.00**			**3.00**	**3.00**					**3.00**	**2.00**	**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

120CAE10 - MICROPROCESSOR AND ITS APPLICATIONS

Course Objectives:

- To understand basic architecture of 16 bit and 32 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
- To understand RISC and CISC based microprocessors.
- To understand concept of multi core processors.

UNIT – I EMBEDDED ARCHITECTURE 9

Embedded Computers – Characteristics of Embedded Computing Applications – Challenges in Embedded System Design – Embedded System Design Process – Requirements Specifications – Architectural Design – Designing Hardware – Software Components – System Integration

UNIT - II REAL TIME OPERATING SYSTEM CONCEPT 9

Desktop OS Versus RTOS – Architecture of the Kernel – Task and Task Scheduler – Interrupt Service Routine – Semaphores – Mutex – Mail Boxes – Message Queues – Event Register – Pipes Signals – Time Memory Management – Priority Inversion Problem.

UNIT – III PROGRAMMING FOR EMBEDDED SYSTEM 9

Embedded Program – Role of Infinite Loop - Compiling, Linking and Locating – Downloading and debugging – Emulators and Simulators Processors – Overview of Embedded C – Programming and Assembly – Register usage conventions – procedure call and return – parameter passing – retrieving parameters – temporary variables.

UNIT – IV NETWORKS 9

Distributed Embedded Architecture – Hardware and Software Architecture – Networks for Embedded System – 12C –CAN bus - SHARC Link Ports – Ethernet – Internet – Design examples – Elevator controller.

UNIT – V CASE STUDY 9

Data Compressor – Alarm Clock – Cell Phones – Audio Player – Software Modem – Digital Still Camera – Telephone answering machine – Engine Control Unit .

Total No. of Periods: 45

Course Outcomes:

CO1. Write programs to run on 8086 microprocessor based systems.
CO2. Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
CO3. Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
CO4. Distinguish between RISC and CISC processors.
CO5. Understand multi core processor and its advantages

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Marily Wolf, “Computers as Components – Principles of Embedded Computing System Design”, Morgan Kaufman Publishers, third edition, 2012.
2. A Nagoor Kani,Microprocessors and Microcontrollers, McGraw Hill Publication, 2019.
3. Muhammad Tahir, Kashif Javed,"Arm Microprocessor Systems Cortex-M Architecture, Programming, and Interfacing",Taylor & Francis Group, 2020.
4. K. Ray & K. M. Bhurchandi, “Advanced Microprocessors and peripherals-Architectures, Programming and Interfacing”, Tata McGraw-Hill, 11th Edition, 2009.
5. Peter Abel, “IBM PC Assembly language and programming”, Prentice Hall of India Pvt. Ltd., 4th Edition, 2009.
6. M.Rafiquzzaman, “Microprocessors Theory and Application”, PHI Learning Private Limited, 2009.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAE10 - MICROPROCESSOR AND ITS APPLICATIONS	CO1	3											
	CO2		3	3									
	CO3					2							
	CO4										2		
	CO5						3						
AVERAGE		**3.00**	**3.00**	**3.00**		**2.00**	**3.00**				**2.00**		

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

120CAL01 - DATA STRUCTURES ALGORITHMS LAB

Course Objectives:

- Teach the student the fundamental algorithms
- Teach the student how to analyze the performance of algorithms
- Teach the student the fundamental algorithmic design strategies

LIST OF EXPERIMENTS

1. Implement Stack operation using array
2. Implement Queue operation using array
3. Create the operation of Singly and doubly linked list
4. Create a binary search tree with their traversals
5. Implement the operation of binary search tree
6. Sort the given list of numbers using quick sort
7. Develop program to sort the numbers using merge sort
8. Perform the Breadth first and depth first search in a given graph
9. Find the shortest path in a given graph using dijkstra algorithm

Total No. of Periods: 45

Course Outcomes:

CO1. Know the big O, omega, and theta notations and their usage to give asymptotic upper, lower, and tight bounds on time and space complexity of algorithms.

CO2. Can use and implement major data structures including binary search trees, balanced search trees, priority-queues, and hash tables.

CO3. Can explain and analyze fundamental graph algorithms including depth-first and breadth-first search, single-source and all-pairs shortest paths, and minimum spanning tree.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAL01 - DATA STRUCTURES ALGORITHMS LAB	CO1	3	3	3	2								
	CO2	3				2							
	CO3	3					2						
AVERAGE		**3.00**	**3.00**	**3.00**	**2.00**	**2.00**	**2.00**						

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

120CAL02 - NETWORK PROGRAMMING LAB

Course Objectives:

- To understand the use of client/server architecture in application development.
- To understand how to use TCP and UDP based sockets.
- To implement network routing algorithms, application layer protocols and encryption algorithms.

LIST OF EXPERIMENTS

1. Implementation of file system call.
2. Implementation of IPC techniques- Pipes, Message Queues and Shared Memory.
3. Implementation of Socket Programming using TCP Sockets.
4. Implementation of Socket Programming using UDP Sockets.
5. Implementation of Daytime Client and Server using Sockets.
6. Simulation of Sliding Window Protocols.
7. Simulation of Routing Protocols.
8. Implementation of Remote Procedure Call.
9. Implementation of Domain Name System.
10. Implementation of HTTP.
11. Implementation of E-mail.
12. Implementation of Multi-user chat.

Total No. of Periods: 45

Course Outcomes:

CO1. Use network programming concepts to develop and implement distributed applications.
CO2. Develop and implement next generation protocols required for emerging applications.
CO3. Model and evaluate performance of networking systems.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAL02 - NETWORK PROGRAMMING LAB	CO1	3				3							
	CO2		3										1
	CO3	3				3							
AVERAGE		**3.00**	**3.00**			**3.00**							**1.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

120CAL03 - SOFTWARE ENGINEERING LAB

Course Objectives:

- To study various testing tools.
- To implement various testing techniques.
- To understand and practice CASE Environments
- Learning about compatibility testing using Selenium RC

LIST OF EXPERIMENTS

USING RATIONAL ROSE SOFTWARE

1. Practicing different types of CASE tools such as Rational Rose used for all the phases of Software development life cycle.
2. Data Modeling.
3. Source Code Generators.
4. Semantic Data Model Generators.
5. Practicing the CASE Environments such as
    a. Toolkits.
    b. Language-centered.
    c. Integrated.
    d. Fourth generation.
    e. Process-centered.

USING SELENIUM SOFTWARE

1. Implement and Test the number of items in a Combo box using Selenium IDE testing too1.
2. Automate a website home page using Selenium IDE with record and playback method.
3. Automate the website using Selenium IDE for at least 3 webpage navigation after the login page.
4. Implement and execute the compatibility testing using Selenium RC for IE Web Browser.
5. Automate the compatibility testing of website using selenium RC for Google Chrome Web Browser.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Software Required

Testing Tools: 1) Rational Rose.
2) Selenium IDE/Selenium RC/.
3) Eclipse IDE.

Web Browser: Google Chrome, Internet Explorer, Mozilla Firefox.

Course Outcomes:

CO1. Ability to design Software development life cycle and shaping Data models
CO2. Familiarising to cod
CO3. Enriching the efficiency to handle Semantic Data Model Generators
CO4. Makes easy to handle Selenium software IDE
CO5. Learn to automate the compatibility testing

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAL03 - SOFTWARE ENGINEERING LAB	CO1	3	3	2									
	CO2												
	CO3										2		
	CO4					3						2	
	CO5	3											
AVERAGE		**3.00**	**3.00**	**2.00**		**3.00**					**2.00**	**2.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

120CAL04 - PROBLEM SOLVING TECHNIQUES LAB USING C

Course Objectives

- To Understand the basic concept of Factorial and mathematical functions
- To gain the knowledge of array with types of dimensions
- To obtain the knowledge of Bit Manipulation
- Practice file operations.

LIST OF EXPERIMENTS

1. Write any C program to implement number conversion system.
2. Write a C program to compute any mathematical functions
3. Write a C program to determine any factoring method.
4. Write a C program to generate Fibonacci number.
5. Write a C program to compute the prime factor of an Integer
6. Write a C program to remove the duplicate from an ordered array
7. Program to Find the k^{th} smallest element from the given array
8. Write a Program of find the given string is palindrome or not.
9. Implement Bit Manipulation
10. Write a C Program to manipulate various file operation

Total No. of Periods: 45

Course Outcomes

CO1. Design an algorithm using factorial and mathematical functions
CO2. To implement array with different types of dimensions
CO3. To develop bit manipulation
CO4. Create a various operation on file concepts

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAL04 - PROBLEM SOLVING TECHNIQUES LAB USING C	CO1	3	3	3									
	CO2										2		
	CO3											2	
	CO4	3				3							
AVERAGE		**3.00**	**3.00**	**3.00**		**3.00**					**2.00**	**2.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

120CAL05 - FINANCIAL MANAGEMENT LAB

Course Objectives

- This course helps students to work with well-known accounting software i.e. Tally ERP.9
- Student will learn to create company, enter accounting voucher entries including advance voucher entries, do reconcile bank statement, do accrual adjustments, and also print financial statements, etc. in TallyERP.9 software.
- Accounting with Tally certificate course is not just theoretical program, but it also includes continuous practice, to make students ready with required skill for employability in the job market.

LIST OF EXPRIMENTS

1. Creation of Company, Accounts Configuration.
2. Classification of Accounts and Create Accounts Master.
3. Account Voucher-Voucher Entry, Conversion, Interest Calculation.
4. Printing and Generating of Voucher.
5. Create a Contra Voucher, Payment and Receipt Voucher.
6. Create Sales and Purchase Voucher, Credit Notes and Debit Notes.
7. Generation of Basic Reports.
8. Create Trading Account.
9. Create Profit/Loss Account.
10. Create Balance Sheet.

Total No. of Periods: 45

Course Outcomes:

CO1. After successfully qualifying practical examination, students will be awarded certificate to work with well-known accounting software i.e. Tally ERP.9

CO2. Student will do by their own create company, enter accounting voucher entries including advance voucher entries, do reconcile bank statement, do accrual adjustments, and also print financial statements, etc. in Tally ERP.9 software.

CO3. Students do possess required skill and can also be employed as Tally data entry operator.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAL02 - NETWORK PROGRAMMING LAB	CO1	3									3		
	CO2							2	2				
	CO3					3							2
AVERAGE		**3.00**				**3.00**		**2.00**	**2.00**		**3.00**		**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	0

BRIDGE COURSE

120CAB001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING -I

Course Objectives:

- To enable the student to learn the major components of a computer system.
- To know the correct and efficient ways of solving problems
- To learn to use office automation tools
- To learn to program in C.

MODULE – I INTRODUCTION TO COMPUTERS

Introduction – Characteristics of Computer – Evolution of Computer – Computer Generation – Classification of Computers – Basic Computer Organization – Number Systems.

MODULE – II COMPUTER SOFTWARE AND INTERNET

Introduction – Types of Software – Software Development Steps – Internet Evolution – Basic Internet Terminology – Getting Connected to Internet Applications.

MODULE – III PROBLEM SOLVING AND OFFICE APPLICATION SOFTWARE

Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudocode – Application Software Packages – Introduction to Office Packages.

MODULE – IV INTRODUCTION TO C PROGRAMMING

Overview of C Programming – Constants, Variable and Data Types – Operators and Expression – Managing Input and Output Operators – Decision Making - Branching and Looping.

MODULE –V FUNCTIONS AND POINTERS

Handling of Character String – User Defined Functions – Definition – Declarations – Call by Reference – Call by Value- Structure and Unions – Pointers - Arrays – The Preprocessor – Developing C Program

Total Number of Hours : 45

Course Outcomes :

CO1. Non Computer Science Student Can Understand the components of Computers
CO2. Ability to Understand Computer Software
CO3. To Gain knowledge of Problem Solving with packages.
CO4. Basic knowledge to write a simple programmes in c
CO5. Understand Functions and pointers.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES :

1. Herbert Schildt, “C: The Complete Reference”,4th Edn., 2017
2. Pradip Dey, Manas Ghoush, “Programming in C”, Oxford University Press. (2007).
3. Byron Gottfried, “Programming with C”, 2 nd Edition, (Indian Adapted Edition), TMH publications, (2006).
4. Stephen G.Kochan, “Programming in C”, Third Edition, Pearson Education India, (2005).
5. Brian W.Kernighan and Dennis M.Ritchie, “The C Programming Language”, Pearson Education Inc., (2005).
6. E.Balagurusamy, “Computing fundamentals and C Programming”, Tata McGraw-Hill Publishing Company Limited, (2008).
7. S.Thamarai Selvi and R.Murugan, “C for All”, Anuradha Publishers, (2008).

Course Name	CO’S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CAB001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING -I	CO1								3	3	3	2	2
	CO2	3	3	3	2								
	CO3		3		3								
	CO4	3	3	3	3								
	CO5	3	3	2	2		3						
AVERAGE		3.00	3.00	2.67	2.5		3.00		3.00	3.00	3.00	2.00	2.00

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	0

120CBP001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING LAB – I

Course Objectives :

- To make the student learn a programming language.
- To learn problem solving techniques.
- To write programmes in C and to solve the problems.

LIST OF EXPERIMENTS

1. Implement arithmetic operators using C.
2. Implement Looping Statements using C
3. Implement Conditional Statements using C.
4. Implement Arrays using C.
5. Implement Functions in C.
6. Implement Structure and Union in C.
7. Implement Pointers in C.

Course Outcomes :

CO1 : Read, understand and trace the execution of programs written in C language.
CO2 : Write the C code for a given algorithm.
CO3 : Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
CO4 : Write programs that perform operations using derived data types.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
120CBP001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING LAB – I	CO1	3											
	CO2	3											
	CO3	3			3	3							3
	CO4	3	3	3									3
AVERAGE		3.00	3.00	3.00	3.00	3.00							3.00

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAT01 - DATABASE MANAGEMENT SYSTEMS

Course Objectives:

- Knowledge of DBMS, both in terms of use and implementation/design
- Understand the areas of database design, SQL and programming
- Understand relational and object oriented database technology for building applications for the current trend
- Evaluate a business situation and designing & building a database applications

UNIT – I INTRODUCTION 9

File systems versus Database systems – Data Models – DBMS Architecture – Data Independence – Data Modeling using Entity – Relationship Model – Enhanced E-R Modeling.

UNIT – II RELATIONAL MODEL AND QUERY EVALUATION 9

Relational Model Concepts – Relational Algebra – SQL – Basic Queries – Complex SQL Queries – Joins -Views – Constraints – Partitions - Dynamic SQL, Other SQL Functions, overview of commercial RDBMSs – Database Design – Functional Dependencies – Normal Forms –1NF – 2NF-3NF-BCNF – 4NF-5NF - Algorithms for Executing Query Operations– Query Processing–Overview– Measures of Query Cost.

UNIT – III TRANSACTION PROCESSING 9

Transaction Processing – Properties of Transactions –Serializability– Transaction support in SQL – Time Stamp ordering – Recovery concepts – Shadow paging, Buffer Management – Log Based Recovery – Database Security Issues – Access control.

UNIT – IV FILES AND INDEXING 9

File Structures – Disks – RAID-File operations – Hashing Techniques – Indexing – Single level and Multi-level Indexes – B+ tree – Static Hashing - Indexes on Multiple Keys.

UNIT - V SPECIAL PURPOSE DATABASES 9

Basic Concepts: Distributed Databases DBMS Architecture, Architecture of Parallel Databases, Database design for ORDBMS - The ODMG Data Model and ODL

Total No. of Periods : 45

Course Outcomes:

CO1. To learn the basic concepts of DBMS
CO2. To Know the concepts of SQL
CO3. To understand PL/SQL, Triggers and cursors
CO4. To know the concept of Normalization
CO5. To implement ORDBMS

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan , "Database System Concepts", McGraw-Hill Education, 2019 .
2. Ramez Elamassri and Shankant B-Navathe, "Fundamentals of Database Systems", Sixth Edition, Pearson Education Delhi, 2010.
3. Raghu Ramakrishnan, Johannes Gehrke ,' Database management systems", McGraw, Hill, 6rd Edition, 2014.
4. Frank. P. Coyle, "XML Web Services and the Data Revolution", Pearson Education, 2012.
5. Lee Chao, "Database Development and Management", Auerbach Publications, 2016.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAT01 - DATABASE MANAGEMENT SYSTEMS	CO1	3				3	3						
	CO2	3				2							
	CO3	3					2						
	CO4							3					
	CO5					3							
AVERAGE		**3.00**				**2.67**	**2.5**	**3.00**					

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAT02 OBJECT ORIENTED PROGRAMMING USING JAVA

Course Objectives

- Basic concepts of Java Fundamental
- Practice an Exception and Multithreading
- Provide a Knowledge about AWT
- To apply networking and SQL Packages
- Understand the Collection framework.

UNIT - I JAVA FUNDAMENTALS 9

Java Features – Java Platform – Java Fundamental – Expression – Operators – Control Structures – Classes and Object – Inheritance – Polymorphism – Abstract class – Interface – Packages – Inner Classes.

UNIT - II EXCEPTION AND MULTITHREADING 9

Exception Handling Fundamentals – Exception Types – Java Built in Exception – Creating Your Own Exception Subclasses – Chained Exceptions – The Java Thread Model – Thread Priorities – Creating Thread: Implementing Runnable interface - Synchronization – Interthread Communication- Using a Factory Method to create and start a thread.

UNIT - III AWT & EVENT HANDLING 9

AWT Classes-Windows Fundamentals-Working with Frame Windows-Working with Font-AWT Control Fundamentals-AWT Components-Understanding Layout Managers-Menu bars and Menus-Event Handling Mechanisms-Delegation Event Model-Event classes-Key Event class-Event Listener Interfaces.

UNIT - IV NETWORKING AND SQL PACAKAGES 9

Networking Basics-Networking Classes and Interface-InetAddress-Inet4 and Intnet6 Address-TCP/IP Client Socket-URL Connections-Cookies-TCP/IP Server Socket-Java Database Connectivity-Introduction JDBC Drivers-JDBC connectivity with MySQL/Oracle-Prepared Statement & Result Set.

UNIT – V COLLECTION FRAMEWORK 9

Collection Overview – The Collection Interface: List Interface-Set Interface –Sorted Set Interface – NavigableSet Interface – Queue and Deque Interface – The Collection Classes – ArrayList Class – LinkedList Class –HashSet Class- LinkedHashSet Class – TreeSet Class – The PriorityQueue Class – The ArrayDeque Class – The EnumSet Class- Accessing a Class via an Iterator

Total No. of Periods: 45

Course Outcomes :

CO1. To apply the fundamental concept of JAVA.
CO2. Implement Exception Handling and Multithreading
CO3. Design an application using AWT.
CO4. Gain Knowledge about Networking and packages
CO5. Deploy Collection framework.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Herbert Schildt, The Java Complete Reference, 11th Edition, Tata McGraw Hill.,2018.
2. Mitsunori Ogihara, “Fundamentals of Java Programming”, Springer Publication, 2018.
3. E. Balaguruswamy, “Programming with JAVA”, 6th Edition, Tata McGraw Hill Publication, 2019.
4. Bart Baesens, Aimee Backiel, Seppe vanden Broucke, " Beginning Java Programming: The Object -Oriented Approach", Wiley Publication, 2015.
5. Wu Thomas, "Introduction to Object-Oriented Programming with Java”, McGraw Hill Education, 2005

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAT02 OBJECT ORIENTED PROGRAMMING USING JAVA	CO1	3				3							
	CO2					2							
	CO3		3	2									
	CO4										3		
	CO5	3											3
AVERAGE		**3.00**	**3.00**	**2.00**		**2.5**					**3.00**		**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAT03 CLOUD COMPUTING

Course Objectives

- To Understand the cloud architecture and model
- Learn about various services involved in cloud.
- Provide a knowledge about virtualization technology.
- Understand Cloud Infrastructure and mobility.
- Knowledge about security and standards in the cloud.

UNIT - I CLOUD COMPUTING FUNDAMENTALS 9

Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing, Applications cloud computing, Business models around Cloud – Major Players in Cloud Computing - Issues in Cloud - Eucalyptus - Nimbus - Open Nebula, CloudSim.

UNIT - II CLUSTER – GRID COMPUTING AND CLOUD MODEL 9

Cluster Computing, Grid Computing, Grid Computing Versus Cloud Computing, Key Characteristics of Cloud Computing. Cloud Models: Benefits of Cloud Models, Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud, Shared Private Cloud, Dedicated Private Cloud, and Dynamic Private Cloud.

UNIT- III CLOUD SERVICES AND FILE SYSTEM 9

Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service- Monitoring as a Service – Communication as services. Service providers- Google App Engine, Amazon EC2, Microsoft Azure, Sales force.

UNIT - IV VIRTUALIZATION 9

Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation. Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

UNIT - V SECURITY IN CLOUD 9

Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Total No. of Periods: 45

Course Outcomes

CO1. To gain the knowledge of cloud architecture and model.
CO2. Idea about various services involved in cloud
CO3. Gain the knowledge about virtualization technology
CO4. Ability to deploy cloud infrastructure and mobility.
CO5. Develop security and standards in the cloud.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, "Cloud Computing A Practical Approach" McGraw-Hill Publication , 2009.
2. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
3. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
4. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
5. Kumar Saurabh, " Cloud Computing – insights into New -Era Infrastructure", Wiley India,2011.
6. Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAT03 CLOUD COMPUTING	CO1					3							
	CO2					3							
	CO3					3	2						
	CO4		3	3									2
	CO5	3											3
AVERAGE		**3.00**	**3.00**	**3.00**		**3.00**	**2.00**						**2.5**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

220CAP06 DATABASE MANAGEMENT SYSTEMS LAB

Course Objectives:

- To give a good formal foundation on the relational model of data
- To present SQL and procedural interfaces to SQL comprehensively
- To present the concepts and techniques relating to query processing by SQL engines
- To present the concepts and techniques relating to ODBC and its implementations.

LIST OF EXPERIMENTS

1. Creation of base tables and views, object for application.
2. Creation of Partition, arrays in table and constraints for tables.
3. Implement Synonym, sequence and privileges for tables.
4. Practice minimum of five Sub Query and Joins
5. Write program by the use of PL/SQL.
6. Implement the following
   a. Use of Cursors,
   b. Procedures,
   c. Functions
   d. Packages
7. Design and Develop Embedded SQL using Database Connectivity with C / Pro C
8. Triggers – Block Level – Form Level.
9. Working with Forms, Menus and Report Writers for an application project in any domain
10. Storing and retrieving Blobs or Clobs in tables through front end tools.

Total No. of Periods : 45

Course Outcomes :

CO1. Design and implement a database schema for a given problem domain
CO2. Populate and query a database using SQL DDL/DML commands.
CO3. Program in PL/SQL including stored procedures, stored functions, cursors, packages.
CO4. Design and build a GUI application

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAP06 DATABASE MANAGEMENT SYSTEMS LAB	CO1	3	3	3									
	CO2				3								
	CO3				3	3							
	CO4	3											3
AVERAGE		**3.00**	**3.00**	**3.00**	**3.00**	**3.00**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE01 - C# AND DOT NET PROGRAMMING

Course Objectives

- Understanding of .Net Programming with fundamental concepts
- Learn the objected oriented aspects of C#
- Practice application on .NET
- To develop web based application development .NET
- Generate reporting and application tools.

UNIT - I C# LANGUAGE FUNDAMENTALS 9

The Building Block of the .NET Platform (CLR,CTS, and CLS) – Overview of Assemblies - The Anatomy of a Simple C# Program - Defining Classes and Creating Objects - The System Console Class-Establishing Member Visibility - Default Values of Class Member Variables-Member Variable Initialization Syntax- Static Keyword - Method Parameter Modifiers - Iteration Constructs - Decision Constructs and the Relational / Equality Operators - Understanding Value Types and Reference Types-Boxing and Unboxing - Working with .NET Enumerations - Overriding Some Default Behaviors of System. Object - The System Data Types - String Data Type - .NET Array Types - Custom Namespaces.

UNIT - II OBJECT ORIENTED PROGRAMMING WITH C# 9

Understanding the C# Class Type - Reviewing the Pillars of OOP - The First Pillars: C#'s Encapsulation Services, The Second Pillar: C#'s Inheritance Support - Programming for Containment/Delegation - The Third Pillar: C#'s Polymorphic Support-C# Casting Rules - Understanding Object Lifetime - Basics of Object Lifetime - Role of Application Roots - Garbage Collection - Building Finalizable and Disposable Types. Exception Handling - Throwing a Generic Exception - Catching Exceptions.

UNIT - III INTERFACES, COLLECTIONS, DELEGATES, EVENTS AND LAMDA EXPRESSION 9

Defining Interfaces in C#-Implementing an Interface in C# - Contrasting Interfaces to Abstract Base Classes-Building Interface Hierarchies - Building Enumerable Types (IEnumerable and IEnumerator) Building Cloneable Objects (ICloneable) -Building Comparable Objects (IComparable) -The Interfaces of the System - Collections Namespace - Defining a Delegate in C# -Simplest Possible Delegate Example-Enabling Multicasting -C# Events - Lamdas Expression.

UNIT-IV DEVELOPING WINDOW APPLICATION FORMS 9

Windows Forms Types - Application Class- Functionality of the Control Class - Functionality of the Form Class- Building Windows Applications - Working with Status Strips - Working with ToolStrips - Building an MDI Application - Basic Controls.

UNIT-V ADO.NET AND ASP.NET 9

ADO.NET Overview – Using Database Connections, Commands, The Data Reader, The DataSet Class,ASP.NET Introduction – Web Forms – ADO.NET and Data Binding- Crystal Report - ASP.NET Features – User and Custom Controls – Master Pages- Site Navigation – Security.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes :

CO1. Knowledge about .Net Programming with fundamental concpets.
CO2. Ability to practice object oriented aspects of C#
CO3. Design an application on .NET
CO4. Deploy an web based application
CO5. Develop an application using ADO .Net and ASP .Net

REFERENCES

1. Andrew Troelsen, "Pro C# 5.0 and the .NET 4.5 Framework" Apress, Sixth Edition,2012 ISBN: 978-1-4302-4233-8
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.
3. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012.
4. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.
5. O`Reilly "Programming C# 5.0" ,O'Reilly Media ISBN: 978-1-4493-2041-6 | ISBN 10:1-4493-2041-4, October 2012.
6. Michael Schmalz "C# Database Basics" O'Reilly Media ISBN:978-1-4493-0998-5, 2012

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE01 - C# AND DOT NET PROGRAMMING	CO1	3											
	CO2						2	2					
	CO3	3	3	3									
	CO4	3											2
	CO5	3											2
AVERAGE		**3.00**	**3.00**	**3.00**			**2.00**	**2.00**					**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE02 – ARTIFICIAL INTELLIGENCE

Course Objectives

- Provide a fundamental concept in Artificial Intelligence
- To enable Problem solving through various searching techniques
- To apply various techniques in application which involve perception, reasoning and learning.
- To apply AI Techniques primarily for machine learning, vision and robotics

UNIT -I INTRODUCTION 9

Artificial Intelligence Definition – Importance of Artificial Intelligence – Knowledge based Systems – Knowledge Representation – State space search – Production systems – Artificial Intelligence Programming Language – PROLOG – Heuristic search - Depth First - Breadth first – Hill climbing – 4 th algorithms – Game Playing..

UNIT – II KNOWLEDE REPRESENTATION 9

Prepositional Logic – Clause form – Predicate logic – Resolution – Inference Rules – Unification – Semantic networks – frames – conceptual dependency – Scripts – Representing Knowledge using rules.

UNIT - III SYMBOLIC REASONING AND UNCERTAINTY 9

Non monotanic Reasoning – Truth maintenance systems – closed world assumption – modal and temporal Logics – Bayes Theorem - certainty factors – Bayesian networks – Dempster – Shafer Theory – Fuzzy logic.

UNIT - IV NATURAL LANGUAGE PROCESSING AND DISTRIBUTED ARTIFICIAL INTELLIGENCE 9

Overview of Linguistics – grammars and Languages – Basic parsing techniques – semantic Analysis and representation structures – Natural language generation – natural language systems – Distributed Reasoning systems – Intelligent agents.

UNIT -V EXPERT SYSTEMS 9

Architecture – Non production systems Architectures – Knowledge acquisition and validation – Knowledge system building tools – Types of Learning – General Learning model – Learning by induction – Generalization and specialization – Inductive bias – Explanation based Learning.

Total No. of Periods: 45

Course Outcomes :

CO1. Provide a basic exposition to the goals and methods of Artificial Intelligence
CO2. Implement the intelligent computational concepts
CO3. Knowledge through learning can be used for problem solving
CO4. Improves problem solving, reasoning, planning, natural language understanding.
CO5. Implement the Machine Learning and Robotics Concepts

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Elaine Rich and Kevin Knight, S.B.Nair, "Artificial Intelligence" TMH Pub. Delhi, 2009.
2. Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall of India, Delhi, 2001.
3. George F Luger, "Artificial Intelligence, structures and strategies for complex problem solving", Pearson Education, Delhi, 2001
4. Rahwan, Iyad, and Guillermo R. Simari, eds. Argumentation in artificial intelligence. Vol. 47. Heidelberg: Springer, 2009.
5. Rahwan, Iyad, and Guillermo R. Simari, eds. Argumentation in artificial intelligence. Vol. 47. Heidelberg: Springer, 2009.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE02 – ARTIFICIAL INTELLIGENCE	CO1					3		2					
	CO2					3							
	CO3	3						3					
	CO4					3	3						
	CO5	3				3							
AVERAGE		**3.00**				**3.00**	**3.00**	**2.5**					

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE03 – BLOCKCHAIN TECHNOLOGY

Course Objectives

- Understand the fundamental concept of Block chain.
- Practice BITCOIN and Cryptocurrency
- To enable BITCOIN and distributed consensus
- To apply of Blockchain Application

UNIT - I INTRODUCTION TO BLOCK CHAIN 9

Block chain- Public Ledgers, Block chain as Public Ledgers -Bitcoin, Block chain 2.0, Smart Contracts, Block in a Block chain, Transactions-Distributed Consensus, The Chain and the Longest Chain - Cryptocurrency to Block chain 2.0 - Permissioned Model of Block chain, Cryptographic -Hash Function, Properties of a Hash Function-Hash pointer and Merkle tree

UNIT - II BITCOIN AND CRYPTOCURRENCY 9

A basic crypto currency, Creation of coins, Payments and double spending, FORTH – the precursor for Bitcoin scripting, Bitcoin Scripts, Bitcoin P2P Network, Transaction in Bitcoin Network, Block Mining, Block propagation and block relay, Consensus introduction, Distributed consensus in open Environments-Consensus in a Bitcoin network.

UNIT – III BITCOIN CONSENSUS 9

Bitcoin Consensus, Proof of Work (PoW)- Hash cash PoW , Bitcoin PoW, Attacks on PoW ,monopoly problem- Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Mining Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Block chains, Execute contracts- Consensus models for permissioned block chain-Distributed consensus in closed environmentPaxos.

UNIT – IV DISTRIBUTED CONSENSUS 9

RAFT Consensus-Byzantine general problem, Byzantine fault tolerant system-Agreement Protocol, Lamport-Shostak-Pease BFT Algorithm-BFT over Asynchronous systems, Practical Byzantine Fault Tolerance

UNIT –V HYPER LEDGER FABRIC & ETHERUM 9

Architecture of Hyperledger fabric v1.1-Introduction to hyperledger fabric v1.1, chain code- Ethereum: Ethereum network, EVM, Transaction fee, Mist Browser, Ether, Gas, Solidity, Smart contracts, TruffleDesign and issue Crypto currency, Mining, DApps, DAO

Total No. of Periods: 45

Course Outcomes

CO1. Understand emerging abstracts models for Blockchain technology.

CO2. Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain

CO3. Provide a conceptual understanding of Block chain function

CO4. Apply Hyper Ledge Fabric and Etheric platform to implement the block chain application

CO5. Develop a simple Blockchain Application

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Mastering Block chain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Block chain frameworks by Bashir, Imran,2017.
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.
3. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015.
4. Bashir, Imran. Mastering block chain. Packt Publishing Ltd, 2017.
5. Kim, Shiho, and Ganesh Chandra Deka, eds. Advanced applications of blockchain technology. Springer, 2020.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE03 – BLOCKCHAIN TECHNOLOGY	CO1				3								
	CO2				3	2							
	CO3	3											
	CO4					3							
	CO5	3											3
AVERAGE		**3.00**			**3.00**	**2.5**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE04 - MOBILE COMPUTING

Course Objectives :

- Understand the basic concepts of mobile computing.
- Be familiar with the network protocol stack.
- Be exposed to Ad-Hoc networks.
- Gain knowledge about different mobile platforms and application development.

UNIT - I INTRODUCTION 9

Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Architecture - Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

UNIT - II MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER 9

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.

UNIT - III MOBILE TELECOMMUNICATION SYSTEM 9

Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

UNIT - IV MOBILE AD-HOC NETWORKS 9

Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.

UNIT - V MOBILE PLATFORMS AND APPLICATIONS 9

Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone - Hybrid mobile applications – M-Commerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.

Total No. of Periods: 45

Course Outcomes :

CO1. Understand the basics of mobile computing.
CO2. Understand the functionality of each layer.
CO3. Gain the knowledge of mobile internet protocol
CO4. Acquired the knowledge to use simulator tools and design Ad hoc networks.
CO5. Able to develop mobile application.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Mutamed Khatib and Nael Salman,"Mobile Computing" Intech Open Publication, 2018.
2. Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2012.
3. Raj Kamal, "Mobile Computing", Second Edition, Oxford University Press, 2012.
4. Himanshu Dwivedi, Chris Clark, David Thiel, "Mobile Application Security", Tata McGraw-Hill, 2016.
5. Wei-Meng Lee, "Beginning Andriod Application Development", Wiley India Pvt. Ltd, 2011.
6. Jochen H. Schiller, "Mobile Communications", Second Edition, Pearson Education, 2009.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE04 - MOBILE COMPUTING	CO1	3									2		
	CO2	3									3		
	CO3	3						3					
	CO4	3				3							
	CO5	3											3
AVERAGE		**3.00**				**3.00**		**3.00**			**2.5**		**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE05 - DATA MINING AND DATA WAREHOUSING

Course Objectives :

- To expose the concepts of Data warehousing Architecture and Implementation.
- To learn the association rule mining for handling large data.
- To understand the concept of classification for the retrieval purposes.
- To identify Business applications and Trends of Data mining.

UNIT – I INTRODUCTION 9

Relation to Statistics, Databases – Data Mining Functionalities – Steps in Data mining Process – Architecture of a Typical Data Mining Systems – Classification of Data Mining Systems – Overview of Data mining Techniques.

UNIT – II DATA PREPROCESSING 9

Data Preprocessing – Data Cleaning, Integration, Transformation, Reduction, Discretization Concept Hierarchies – Concept Description: Data Generalization and Summarization based Characterization – Mining Association Rules: Apriori Algorithm, Partition Algorithm and FP-Tree Growth Algorithm.

UNIT – III CLASSIFICATION AND CLUSTERING 9

Classification and Prediction: Issues Regarding Classification and Prediction – Classification by Decision Tree Induction – Bayesian Classification – Other Classification Methods: Genetic Algorithms, Rough Set Theory and Fuzzy Set Approach - Prediction – Cluster Analysis: Types of Data in Cluster Analysis – Categorization of Major Clustering Methods: Partitioning Methods: K- Means and K- Medoids Methods – Hierarchical Methods: BIRCH, ROCK and CHAMELON.

UNIT – IV DATA WAREHOUSING 9

Data Warehousing Components – Multi Dimensional Data Model – Data Warehouse Architecture – Data Warehouse Implementation – Mapping the Data Warehouse to Multiprocessor Architecture – OLAP – Need – OLAP Operations – Categorization of OLAP Tools.

UNIT – V APPLICATIONS 9

Applications of Data Mining – Social Impacts of Data Mining – Tools – An Introduction to WEKA – DB2 – MOA – DBMiner - Python Libraries – Case Studies – Mining WWW – Mining Text Databases – Mining Spatial Databases.

Total No. of Periods: 45

Course outcomes :

CO1. Preprocess the data for mining applications
CO2. Apply data mining techniques and methods to large data sets
CO3. Apply the association rules for mining the data
CO4. Use data mining tools.
CO5. Compare and contrast various classifiers

REFERENCES

1. Parteek Bhatia, “Data Mining and Data Warehousing Principles and Practical Techniques”, Cambridge Publication, 2019.
2. Jiawei Han, MichelineKamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 2002, 2nd Edition.
3. Alex Berson, Stephen J. Smith, “Data Warehousing, Data Mining,& OLAP”, Tata McGraw- Hill, Edition 2011.
4. Dunham Margaret H , “Data Mining : Introductory and Advanced Topics” , Pearson Education, Inc., 2012.
5. Sean Kelly, “Data Warehousing in Action”, John Wiley & Sons Inc., 2007.
6. David Hand, Heikki Mannila, Padharic Symth, ”Principles of Data Mining”,PHI,2009.
7. Arun K.Pujari,”Data Mining Techniques”, University Press, 2013, 3rd Edition.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE05 - DATA MINING AND DATA WAREHOUSING	CO1	3					3						
	CO2	3						3					
	CO3	3					2						
	CO4					3							
	CO5				3								
AVERAGE		**3.00**			**3.00**	**3.00**	**2.5**	**3.00**					

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE06 - DIGITAL MARKETING

Course Objectives

- Know the important and growing role of digital marketing plays in both consumer and organizational target markets.
- Discussing current issues in digital marketing and customer service strategies,
- It focuses on effective CRM; key service delivery elements; and service recovery strategies that lead to the successful implementation of a customer focus.
- The Course aims at developing understating about the concepts, strategies, various functions, operations, activities and problems of Retail business decisions.
- To enhance student‘s capability to identify and analyze business environment and its opportunities and limitations, Digital copy rights and Electronics commerce and Multimedia and digital video

UNIT – I INTRODUCTION 9

Going Digital – The changing face of advertising – The Technology behind digital marketing – Strategic thinking: Why you need a digital marketing strategy – Defining your digital marketing strategy – Understanding the digital marketing strategy – Understanding the digital consumer – Mind your Ps – Your window to the digital world – Mobile Marketing.

UNIT – II SEARCH ENGINE MARKETING 9

The search for success: Search: the online marketer`s holy grail – About the engines – Optimizing your site for the engines – Advertising on the search engines – Black Hat, the darker side of search – Bringing in the pros – Universal search –more opportunities to rank – Website intelligence and return on investment.

UNIT – III MARKETING TRENDS 9

E-mail marketing: The new direct mail – what exactly is e-mail marketing – Planning your campaign – Dos and Don`ts of an e-mail marketing campaign – Measuring your success – Still a vital component of digital marketing – Social media and online consumer engagement: join the conversation – What is social media – The different forms of social media – The rules of engagement – Adding social media to your own site – Online PR and reputation management.

UNIT – IV AFFILIATE AND MARKETING ON INTERNET 9

Affiliate marketing and strategic partnerships: Recognizing opportunities for strategic partnership – What is affiliate marketing – The click that really counts – What advertisers should do – Digital media creative: Creative application of digital media – using an agency Digital creative: what works and what doesn`t – The age of new information-Based marketing - – Advertising on internet – Charting the on-line Marketing Process.

UNIT – V CONSUMER SEARCH AND RESOURCE DISCOVERY 9

Search and resource discovery paradigms – Information search and retrieval – Information filtering – On-demand education and digital copy rights: Computer based education and training – Digital copy rights and Electronics commerce – Multimedia and digital video: Key multimedia concepts – Desk top video processing – Desk top video conferencing.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes:

CO1. Students would be familiar with digital business and the opportunities and obstacles.
CO2. Acquire clarity in digital management practices and Advertising on the search engines.
CO3. Students would be familiar with use of technology in retailing business.
CO4. Analyze and critically evaluate by adding social media and the practice of digital marketing.
CO5. Identify and analyses the different components of Computer based education and training in digital marketing.

REFERENCES

1. Dawn McGruer, "Dynamic Digital Marketing", Wiley Publication, 2020.
2. Damian Ryan , Understanding Digital Marketing : Marketing Strategies for Engaging the Digital Generation, Kogan Page publisher, 3rd Edition, 2014.
3. Ravi Kalakota and Andrew B.Whinston, 'Frontiers of Electronic Commerce', Pearson Edu Inc., 9th Ed, 2009.
4. Deepak Bansal, A Complete Guide To Search Engine Optimization, B.R Publishing Corporation, Ist Edition, 2009.
5. Grienstein and Feinman- 'E-commerce –Security, Risk Management and Control', McGraw-Hill Inc.,US, Ed 2, 2009.
6. Jonah Berger, Contagious Why Things Catch On, Simon & Schuster, 2013.
7. E-Marketing: The essential guide to marketing in a digital world, Rob Stokes, Quirk eMarketing (Pty) Ltd. 5th Ed, 2013.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE06 - DIGITAL MARKETING	CO1										3	3	
	CO2								2	3			
	CO3								3				
	CO4				3								
	CO5		3	3	3								
AVERAGE			**3.00**	**3.00**	**3.00**				**2.5**	**3.00**	**3.00**	**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE07 - PROBABILITY AND STATISTICAL METHODS

Course Objectives

- To impart the knowledge of basic probabilistic theory.
- To learn one dimensional discrete and continuous probability distributions occurring in natural phenomena.
- To extend the probability theory to two dimensional random variable and to study the statistical measures.
- To introduce the notion of sampling distributions and acquire the knowledge of statistical techniques useful in decision making.
- To expose the statistical methods for analysis of variance and control limits

UNIT - I PROBABILITY AND RANDOM VARIABLES 9

Axioms of probability - Conditional probability - Total probability – Baye's theorem- Applications- Random variables - Probability mass function - Probability density function - Properties - Moments - Moment generating functions and their properties.

UNIT – II PROBABILITY DISTRIBUTIONS 9

Discrete Probability Distributions: Binomial, Poisson and Geometric distributions – Continuous probability distributions: Uniform, Exponential, and Normal distributions and their properties.

UNIT - III TWO-DIMENSIONAL RANDOM VARIABLES 9

Joint distributions – Marginal and Conditional distributions – Covariance – Correlation and Linear regression – Central limit theorem (Statement and applications only for independent and identically distributed random variables).

UNIT - IV TESTING OF HYPOTHESIS 9

Sampling distributions - Tests for single mean, proportion, Difference between means (large and small samples) – Tests for single variance and equality of variances – Chi-square test for goodness of fit – Independence of attributes.

UNIT - V DESIGN OF EXPERIMENTS 9

Analysis of variance – Completely Randomized Design (CRD) -one way classification – Randomised Block Design (RBD) -two way classification - Latin Square Design (LSD) – Factorial Designs- 2^2 Factorial designs- Control charts for measurements - $\bar{x}$ chart, R-chart, *p* - chart and *np* – chart.

Total no. of periods: 45

Note: Use of approved statistical table is permitted in the examination.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes

CO1. Imbibe the knowledge of basic probability and apply in probability functions.
CO2. Aquaint the ability of fitting the real time problems into probability distribution models and interpret.
CO3. Use the concept of two dimensional random variables that helps to understand and analyse the statistical measures of probability functions.
CO4. Draw inference & decision making through hypothesis testing.
CO5. Implement the knowledge of analysis of variance and control limits in real time applications.

REFERENCES

1. Miller and Freund. "Probability and Statistics for Engineers", Pearson Education, Asia, 7th edition.
2. Spiegel, M.R, Schiller, J and Alu Srinivasan, R, "Schaum's Outlines Probability and Statistics", Tata McGraw-Hill Publishing Company Ltd. New Delhi, 2007.
3. Veerarajan.T., "Probability, Statistics and Random Processes", Tata McGraw-Hill publishing company Limited, New Delhi.
4. Gupta.S.C.,&Kapoor,V.K., "Fundamentals of mathematical statistics", 11th edition, Sultan Chand & Sons publishers, New Delhi.
5. Kandasamy.P, Thilagavathy,K.,&Gunavathi.K., "Probability, Statistics and Queueing Theory"., S.Chand& Company Ltd., New Delhi.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE07 - PROBABILITY AND STATISTICAL METHODS	CO1	3									3		
	CO2	3	3										
	CO3	3		3									
	CO4							3					
	CO5					2							
AVERAGE		**3.00**	**3.00**	**3.00**		**2.00**		**3.00**			**3.00**		

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE08 - ORGANIZATIONAL BEHAVIOUR

Course Objectives

- To learn the ideas of organisational behaviour.
- To impart the knowledge of individual and group behaviour.
- To know about the work stress in the companies.
- Acquire the skills of professionalism in business decision making.
- To study the relationships between the variables, time series analysis and index numbers.

UNIT - I INTRODUCTION TO OB & INDIVIDUAL BEHAVIOR 9

Meaning & Importance of OB - Contribution Disciplines - Foundation of individual behavior attitudes, job satisfaction, Personality, Perception – Organisational culture – Legal aspects in business.

UNIT - II GROUPS & MOTIVATION 9

Individual decision making - Basic concepts to application - Motivation Theories – Maslow, McGregor, McClelland theories – Groups- Stages of Group Development – Teams – Organizational Culture & Socialization process.

UNIT - III ORGANIZATIONAL CONFLICT AND CAREER DYNAMICS 9

Conflict process ,source of conflict - Structural approach to conflict management - Resolving conflict through negotiation - Power and politics in organization - Work stress and its management - Cause and consequences - Stress coping strategies.

UNIT – IV ETHICS AND MORAL VALUES 9

Variety of Moral issues – Moral dilemmas. Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional ideals and virtues – Theories about right action – Self-interest.

UNIT – V RESPONSIBILITIES AND RIGHTS 9

Collegiality and loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Discrimination – Computer Ethics - Moral Leadership – Sample code of conduct.

Total No. of periods: 45

Course Outcomes:

CO1. Understand and learn the effective interpersonal, team building and leadership skills.
CO2. Familiarized to adjust better in organizational settings (by developing an understanding of how and why others behave in a particular manner).
CO3. Improved the organizational performance through the effective management of human resources.
CO4. Acquire Professions and Professionalism – Professional ideals and virtues
CO5. Understand the importance of being loyal and develop the best leadership skills.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. M. Beulah Viji Christiana," Organizational Behavior", Educreation Publication, 2018.
2. Robbins Stephen p,Organizational Behaviour 12th edition. Prentice Hall(india)Pvt Ltd,2000.
3. Luthan Fred, Organizational Behaviour,Tata McGrawHill 2000.
4. McshaneL.StevenvonGlinow Ann Mary Sharma R.Radha Book nameOrganisational Behaviour,Publisher Tata Mcgraw Hill 2006.
5. Robin Fincham Peter Rhodes, Principle of Organizational Behaviour, Oxford University press, 2005.
6. Dwivedi R.S,Human Relations and Organizational Behaviour A Global Perspective 5th Edition Palgrave Macmillan 2006.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE08 - ORGANIZATIONAL BEHAVIOUR	CO1								3	2	3		
	CO2								3			3	
	CO3							3	2				
	CO4								3				
	CO5							3	2	3	2		
AVERAGE								**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE09 - EMBEDDED SYSTEMS

Course Objectives

- Point out the basic concepts and architecture of the embedded systems.
- Understand the fundamental concept of RTOS and OS.
- Obtain the knowledge on programming for embedded system
- Analyse various networking protocols
- Apply the various design in real time applications

UNIT – I EMBEDDED COMPUTING 9

Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.

UNIT - II MEMORY AND INPUT / OUTPUT MANAGEMENT 9

Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupt handling.

UNIT - III PROCESSES AND OPERATING SYSTEMS 9

Multiple tasks and processes – Context switching – Scheduling policies – Inter-process communication mechanisms – Performance issues.

UNIT - IV EMBEDDED C PROGRAMMING 9

Programming embedded systems in C – C-looping structures – Register allocation – Function calls – Pointer aliasing – structure arrangement – bit fields – unaligned data and endianness – inline functions and inline assembly – portability issues.

UNIT - V EMBEDDED SYSTEM DEVELOPMENT 9

Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Introduction to Internet of Things - Design issues – Design methodologies – Case studies using IoT– Complete design of example systems.

Total No. of Periods : 45

Course Outcomes

CO1. Identify the basic concepts and architecture of the embedded system
CO2. Summarize the various concepts of RTOS and OS.
CO3. Design and develop application for embedded System
CO4. Gain Knowledge on various communication protocols.
CO5. Deploy the real time applications with RTOS

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Andrew N Sloss, D. Symes, C. Wright, "ARM System Developers Guide", Morgan Kauffman/ Elsevier,2006. (unit 4)
2. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015
3. Muhammed Ali Mazidi, Janice Gillispie Mazidi and Rolin D. Mc Kinlay, "The 8051 Microcontroller and Embedded Systems", Pearson Education, Second edition, 2007 (unit 1)
4. Michael J. Pont, "Embedded C", Pearson Education, 2007.
5. Steve Heath, "Embedded System Design", Elsevier, 2005.
6. Wayne Wolf, "Computers as Components: Principles of Embedded Computer System Design", Elsevier, 2006.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE09 - EMBEDDED SYSTEMS	CO1					3							
	CO2				3								
	CO3		2	3									
	CO4	3						2					
	CO5	2						2					1
AVERAGE		**2.5**	**2.00**	**3.00**	**3.00**	**3.00**		**2.00**					**1.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

220CAE10 - ENVIRONMENTAL SCIENCE AND DISASTER MANAGEMENT

Course Objectives

- Understand the Concept of Environment, Ecosystem and Biodiversity.
- Knowledge about Environmental Pollution
- Learn about the Natural Resources
- Able to get Knowledge in the disaster Management
- Approaches to disaster risk reduction

UNIT- I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 9

Definition, scope and importance of Risk and hazards– concept of an ecosystem – structure and function of an ecosystem – energy flow in the ecosystem – ecological succession processes – Introduction, types, characteristic features, structure and function of Ecosystem– Introduction to biodiversity– biogeographical classification of India– India as a mega diversity nation – hot-spots of biodiversity – threats to biodiversity- In-situ and ex-situ conservation of biodiversity.

UNIT- II ENVIRONMENTAL POLLUTION 9

Definition – causes, effects and control measures - Air pollution - Water pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution - Nuclear hazards–role of an individual in prevention of pollution – pollution case studies – Field study of local polluted site

UNIT- III NATURAL RESOURCES 9

Forest resources – Water resources – Mineral resources - Food resources – Energy resources - Energy Conversion processes – Land resources – Equitable use of resources for sustainable lifestyles - Introduction to Environmental Biochemistry – Biochemical degradation of pollutants, Bioconversion of pollutants. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT- IV INTRODUCTION TO DISASTERS 9

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc – Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability – Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don'ts during various types of Disasters.

UNIT V: APPROACHES TO DISASTER RISK REDUCTION (DRR) 9

Disaster cycle – Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Institutional Processes and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

Total No. of Periods : 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous)
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes

CO1. Gain the knowledge of Environment, Ecosystem and Biodiversity.
CO2. Help the Student Understand the Environment pollution.
CO3. Able to understand the Natural Resources
CO4. Gain Knowledge in disaster management
CO5. To determine the approaches to disaster risk reduction

REFERENCES

1. Amita Singh, Milap Punia, Nivedita P.Haran, Thiyam P. Haran , Thiyam Bharat Singh," Development and Disaster Management", Springer Publication, 2018.
2. T. Meenambal, "Fundamental of Environmental Science and Engineering", MJP Publisher, 2019.
3. Gilbert M Master, Wendell, "Introduction to Environmental Engineering and Science", Pearson Education Limited 2013.
4. M.M Sulphey, "Disaster Management", PHI Learning Private Limited, 2016.
5. Anthony Mays,"Disaster Management Enabling Resilience", Springer Publication, 2014.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAE10 - ENVIRONMENTAL SCIENCE AND DISASTER MANAGEMENT	CO1	3											
	CO2						3						
	CO3	3							2				
	CO4						3						
	CO5						3		3		3	1	
AVERAGE		**3.00**					**3.00**		**2.5**		**3.00**	**1.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

220CAL01 - JAVA PROGRAMMING LAB

Course Objectives

- Understand the fundamental concepts of OOPs.
- Practice Interface, Abstract and Multithreading
- Knowledge in Window Based applications
- Understand Database Connectivity and Network Classes
- Knowledge about an application built using API.

LIST OF EXPERIMENTS

1. Practice Control Structure through simple program.
2. Program to implement interface and packages
3. Program to implement caught and uncaught exception
4. Program to implement Multithreading concept
5. Develop Window Based Application using Menu and Menu Bar.
6. Design an application based on event listener.
7. Develop a simple java database connectivity program.
8. Implement Network Classes and sockets.
9. Write a simple java program to implement Set and sortSet Interface
10. Design and Develop a Chat Application using Java API

Total No. of Periods: 45

Course Outcomes

CO1. Able to Know the fundamental concepts of OOPs.
CO2. To obtain the knowledge about Interface, Abstract and Multithreading Concepts.
CO3. Design and Develop a window based applications.
CO4. Deploy an application with database.
CO5. To Develop and Deploy an application with API.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAL01 - JAVA PROGRAMMING LAB	CO1	3				3							1
	CO2	3			3								
	CO3	3	2	3									
	CO4	3	3	3									
	CO5	3											2
AVERAGE		**3.00**	**2.5**	**3.00**	**3.00**	**3.00**							**1.5**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

220CAL02 CLOUD COMPUTING LAB

Course Objectives

- To develop web applications in cloud
- To learn the design and development process involved in creating a cloud based application
- Practice Schedule algorithm
- Understand transfer of file form one virtual machine to another
- To learn to implement and use parallel programming using Hadoop

LIST OF EXPERIMENTS

1. Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8.
2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
3. Install Google App Engine. Create hello world app and other simple web applications using python/java.
4. Use GAE launcher to launch the web applications.
5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
6. Find a procedure to transfer the files from one virtual machine to another virtual machine.
7. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
8. Install Hadoop single node cluster and run simple applications like wordcount

Total No. of Periods: 45

Course Outcomes :

CO1. Configure the various virtualization tools such as virtual box, VMWare Workstations.
CO2. Design and Deploy a web application in PaaS Environment.
CO3. Learn how to simulate a cloud environment to implement new schedulers
CO4. Install and use a generic cloud environment that can be used as a private cloud.
CO5. Manipulate the large dataset in a parallel environment.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAL02 CLOUD COMPUTING LAB	CO1					3							
	CO2	3	3	3									
	CO3						2						
	CO4					2							
	CO5								3			2	
AVERAGE		**3.00**	**3.00**	**3.00**		**2.5**	**2.00**		**3.00**			**2.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

220CAL03 C# AND DOT NET PROGRAMMING LAB

LIST OF EXPERIMENTS

Course Objectives :

- Design, document, code and test small C# console and GUI applications.
- Design, document, code and unit test class libraries.
- Use an object browser and .NET documentation to examine C# and the .NET framework namespace contents.

1. Programs using Branching, Looping.
2. Programs using Methods, Arrays, Strings.
3. Programs using Inheritance.
4. Programs using Delegates, Events, Errors and Exceptions.
5. Program to Build a Calculator Widget.
6. Design a simple application based on LAMDA Expression
7. Design and develop any window application using Delegates.
8. Design and Deploy a MDI Application using Events
9. Implement ADO.Net Window applications
10. Design and develop user and custom control in ASP.Net

Total No. of Periods: 45

Course Outcomes :

CO1. The students able to create simple web applications and window applications.
CO2. To learn fundamentals of window application programming and create a window application.
CO3. To develop web applications and learn advanced features of C#.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAL03 C# AND DOT NET PROGRAMMING LAB	CO1	3											3
	CO2	3				3							
	CO3	3											3
AVERAGE		**3.00**				**3.00**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

220CAL04 IMAGE PROCESSING LAB

Course Objectives

- Understand the basic concepts of Digital Signal Processing basics.
- Point the activities of transformation and enhancement of images.
- Obtain the knowledge Binary Image Processing
- To Learn about the compression and coding schemes

LIST OF EXPERIMENTS

1. Practice Digital Signal Processing Basics
2. Program to implement Image Transformation
3. Program to implement Image Enhancement
4. Program to implement Image Restoration and Denosing
5. Practice Binary Image Processing.
6. Implement Image Segmentation
7. Implement a Color Image Processing.
8. Implement Wavelet Based Image Processing
9. Write a program to implement Object Recognition and Neural Network Simulation

Total No. of Periods: 45

Course Outcomes

CO1. Gain the knowledge of Digital Signal Processing.
CO2. Design and deploy the process of transformation and enhancement images.
CO3. Summarize the concept of Binary Image Processing
CO4. Develop compression techniques in digital images
CO5. Gain a practical knowledge in Digital Image Processing.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAL03 C# AND DOT NET PROGRAMMING LAB	CO1	3					3						
	CO2		3	3									
	CO3							3					
	CO4	3											2
	CO5	3				2							
AVERAGE		**3.00**	**3.00**	**3.00**		**2.00**	**3.00**	**3.00**					**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

220CAL05 DATA MINING AND DATA WAREHOUSING LAB

Course Objectives :

- Practical exposure on implementation of well-known data mining tasks.
- Exposure to real life data sets for analysis and prediction.
- Practice data mining project for a given practical domain.

LIST OF EXPERIMENTS

1. Performing data pre-processing tasks for data mining in WEKA.
2. Implement the algorithm to generate a decision tree and convert it into "if –then – else rules"
3. Implement FP-Growth and Apriori algorithm.
4. Implement association rule mining.
5. Implement clustering algorithms
6. Implement Naïve Bayes classification.
7. Implement K- nearest neighbor classification
8. Implement Linear Regression
9. Implement defining subject area, design of fact dimension table.
10. Implement OLAP, roll up, drill down, slice and dice operation.

Total No. of Periods: 45

Course outcomes :

CO1. The data mining process and important issues around data cleaning, pre-processing and integration.

CO2. Practice the principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAL05 DATA MINING AND DATA WAREHOUSING LAB	CO1	3	3	3	3								
	CO2				2	3							
AVERAGE		**3.00**	**3.00**	**3.00**	**2.5**	**3.00**							

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

BRIDGE COURSE

L	T	P	C
3	0	0	0

220CAB001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING -II

Course Objectives :

- To understand the fundamental concepts of database management systems.
- Understand the basic concept of web design
- To know the basic principle of management functions
- To gain the knowledge of statistical methods.

MODULE I – DATABASE MANAGEMENT SYSTEM

Database System vs File System – View of Data – Data Models- Database Languages- Transaction Management – Database Systems Structure- History of Database Systems- Entity Relationship Model.

MODULE II – QUERY PROCESSING

SQL – Basic Structure – Set Operations – Complex Queries – Joined Queries – DDL Embedded SQL- Dynamic SQL – Other SQL Functions – Query by Example – Integrity and Security of Searching – Relational Data Base Design

MODULE III – HTML

Introduction – basic tags – elements – attributes – phrase tags – meta tags – Commends tag – formatting – images – tables – list – forms – embedded with multimedia – div tag – CSS – inline – embedded - external

MODULE IV – HUMAN RESOURCE MANAGEMENT

Introduction to management function: Human Resource Development – selection & training, Marketing Management- Concept, Scope and four components i.e. product, Price, Place and Promotion, Manufacturing Management: - Production System, Production Planning and Control, Strategic Planning.

MODULE V - STATISTICS

Statistics methods- Sampling, Population, Sample and Sample size, Methods of Sampling, Time series analysis, Hypotheses, Procedure of testing of hypothesis, Test of Significance, Chi-Square test ‘Z’ test and T-Test.

Total Number of Hours : 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes :

CO1: Understand the database management systems and design database for simple Application.
CO2: Ability to design a simple web page
CO3: Understand the management skills
CO4: Ability to improve statistical skills.

REFERENCES :

1. Morris Mano, "Digital Logic & Computer Design" PHI 2017.
2. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.
3. R.Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education Addison Wesley, 2007.
4. M.Morris Mano," Computer System Architecture", Prentice Hall of India, 3rd edition, 2005
5. Mirza S. Saiyadain "Human Resources Management" Tata McGraw –Hill, 4th Edition, 2009.
6. Sarah Gilmore & Steve Williams "Human Resource Management" Oxford University Press, 2010.
7. Kandasamy.P,Thilagavathy,K.,&Gunavathi.K., "Probability, Statistics and Queueing Theory"., S.Chand& Company Ltd., New Delhi.
8. Miller and Freund., "Probability and Statistics for Engineers", Pearson Education, Asia, 7th edition.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CAB001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING -II	CO1	3	3	3		3							3
	CO2	3	3										3
	CO3	3							3	3	3	3	2
	CO4	3						3				3	
AVERAGE		3.00	3.00	3.00		3.00		3.00	3.00	3.00	3.00	3.00	2.67

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	0

220CBP001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING LAB – II

Course Objective :

- To familiarize the fundamental concept of tables
- To learn Basic DCL and DML commands
- To gain fundamental knowledge of webpage design
- To learn attractive webpage using CSS

LIST OF EXPERIMENTS

1. Execute single commend line for table
2. Execute group function for a table
3. DCL Commands
4. DML Commands
5. Create and manipulate a various Complex Queries
6. Design a simple webpage using forms in HTML
7. Design a simple webpage using DIV tag with CSS.
8. Design a simple webpage using TABLE tab in HTML

Course Outcomes :

CO1: To Understand and manipulate table operations

CO2: To implement various DML and DDL commands

CO3: To design simple web page.

CO4: To develop attractive style sheet using CSS

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
220CBP001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING LAB – II	CO1	3	3	3									2
	CO2	3	3	3									2
	CO3	3	3	3									3
	CO4	3	3	3									2
	CO5												
AVERAGE		3.00	3.00	3.00									2.25

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAT01 – WEB PROGRAMMING

Objectives :

- To Understand the fundamental concept of PHP
- To identify the role of PHP Array and PHP Functions.
- To build an application with database and cookies.
- To understand the file handling and object oriented concepts.
- To Construct the Web Page using PHP Framework.

UNIT - I INTRODUCTION 9

Getting PHP - Creating a First PHP Page - Printing Some Text - Working with Variables - Creating Constants - Understanding PHP's Internal Data types – Operators and Flow Control – String**:** String Functions – Formatting text Strings.

UNIT - II ARRAYS AND FUNCTIONS 9

Arrays: Handling Arrays with Loops – PHP Array Functions-Converting String and Arrays – Sorting Arrays – Handling Multidimensional Arrays – Moving through Arrays – Splitting and Merging Arrays – Other Array functions – Functions: Creating function in PHP – Introduction to Variable Scope in PHP – Nesting Functions.

UNIT – III WORKING WITH DATABASES AND COOKIES 9

Database Introduction – Creating MYSQL Database - Accessing database in PHP – Updating Databases – Inserting item into a Database – Delete Records. Setting a Cookie – Reading a Cookie – Session – Working with FTP – Downloading Files with FTP – Deleting a File with FTP.

UNIT – IV FILE HANDLING & OBJECT ORIENTED CONCEPTS 9

Handling Form Controls – Handling Hidden Controls – Image Maps – Handling file Uploads. File Handling: Opening Files – Closing a File – Reading and Writing to a File – Appending to File – Classes and Objects – Constructors and Destructors Inheritance – Overriding Methods – Overloading Methods.

UNIT – V PHP FRAMEWORKS 9

Frameworks Introduction – Types of Frame works – Codeignter Framework Installation – Query manipulations: Insert – Update – Retrieve – Delete -File Upload – Import / Export Excel – Laravel Framework view.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course outcomes :

CO1: Ability to understand the fundamental concept of PHP
CO2: To Implement PHP Array and PHP Functions
CO3: Work with database and cookies for real time applications,
CO4: Work with Web application using File handling along with Object Oriented Concept.
CO5: Design and develop applications using advanced frameworks.

REFERENCES

1. Steven Holzner, PHP The Completer Reference, McGraw Hill Education, reprint 2013.
2. David Sklar and Adam Tracktenberg, PHP Cookbook, Oreilly, 2nd Edition, 2010.
3. Steve Suehring, Tim Converse Joyce Park, PHP 6 and MYSQL Bible, 2009.
4. Ed Lecky, Thompson, Steve D Nowicki, Professional PHP6, Wiley India, 2009.
5. Kevin Tatore, Peter MacIntyre and Rasmus Lerdorf, Programming PHP, O'Reilly, 2015.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAT01 – WEB PROGRAMMING	CO1	3			3								
	CO2					2							
	CO3						3						
	CO4						3						2
	CO5	3											3
AVERAGE		**3.00**			**3.00**	**2.00**	**3.00**						**2.5**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAT02 – MOBILE APPLICATION DEVELOPMENT

Objectives :

- To learn the basic concept of Android features, tool and anatomy.
- To understand the functionalities of Activities, Intents and Components
- To Know the role of Views and Data Persistence
- To Build an Application with Messaging, Network and Location Based Services
- To learn the basic Concept of IoS.

UNIT - I INTRODUCTION 9

Introduction to Android- Features of Android – Architecture of Android – Android device in the market – Obtaining the required tools: Eclipse- Android SDK – Android Development tool(ADT) – Creating Android Virtual Devices- Creating your first application- Anatomy of an application

UNIT - II ACTIVITIES, INTENTS and COMPONENTS 9

Understanding Activities: Applying Style and Themes to Activity- Displaying a Dialog Window- Displaying a Progress Window-Linking Activities Using Intents – Calling Built in Application using Intents- Understanding the component of a screen- Adapting to display orientation- Managing changes to screen orientation.

UNIT - III VIEWS AND DATA PERSISTENCE 9

Basic Views- Picker Views- List Views – Using Images Views to Display Pictures – Using Menus with Views – Some Analog View: Analog Clock View-Digital Clock View –Web View- Saving and Loading User Preferences – Persisting Data to Files – Creating and Using Databases: insert, delete, update, search database –Building the database with applications.

UNIT – IV MESSAGING, NETWORKING AND LOCATION BASED SERVICES 9

Sharing data in android-Using a Content provider: Projection-Filtering-Sorting-Creating own content provider- SMS Messaging- Sending E-mail – Networking – Displaying Maps – Getting Location Data – Creating your own Services.

UNIT – V IOS 9

Getting the Tools - iOS Project: Anatomy of an iOS App, XCode ide - Debugging iOS App – iOS simulator – Debugging Code – Instruments - Objective C Basics – Simple App Development – Building the Derby App in iOS – Other Useful iOS things.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes:

CO1: Gain Knowledge about Android features, tool and anatomy.
CO2: Design an application using activities, intent and components
CO3: Identified the role of View and Persistence
CO4: Implement Android Application using Messaging, Location Based Services
CO5: Gain Knowledge about IoS.

REFERENCES

1. Wei-Meng Lee, "Beginning Android Application Development", Wiley 2011
2. Jeff Mc Wherter and Scott Gowell, "Professional Mobile Application Development", Wrox 2012.
3. Himansu Dwivedi, Chris Clark and David Thiel, "Mobile Application Security", Tata McGraw Hill Edition 2010.
4. Paul Deitel, Harvey Deitel, Abbey Deitel and Michael Morgany, "Android for Programmers An App-Driven Approach", Pearson 2012.
5. Reto Meier, "Professional Android 4 Application Development", Wiley 2015.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAT02 – MOBILE APPLICATION DEVELOPMENT	CO1	3				3							
	CO2	3	3	3									
	CO3					3							
	CO4	3				2							2
	CO5	3			2								
AVERAGE		**3.00**	**3.00**	**3.00**	**2.00**	**2.67**							**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAT03 – BIG DATA MANAGEMENT

Objectives :

- To learn the basic concept of data and NoSQL Data Management.
- To understand fundamental of Hadoop.
- To build MAPREDUCE Applications.
- To compare the process of PIG, HIVE and HBASE.
- To understand data streaming and Hadoop Clustering

UNIT - I BASICS OF DATA AND NOSQL DATA MANAGEMENT 9

Introduction - Big Data - Data-Data Storage and Analysis - Comparison with Other Systems - Convergence of Key Trends - Unstructured Data - Industry Examples of Big Data - Big Data Technologies - NOSQL Data Management - Introduction to NOSQL - Aggregate Data Models - Relationships - Graph Databases - Schemaless Databases - Materialized Views - Distribution Models - Version Stamps – Mapreduce - Partitioning and Combining - Composing Mapreduce Calculations.

UNIT - II HADOOP INTRODUCTION 9

Hadoop : History of Hadoop - Components of Hadoop -Application Development in Hadoop - Getting your Data into Hadoop - Other Hadoop Components - Basics of Hadoop - Data Format - Analyzing Data with Hadoop - Scaling out – DataFlow - Hadoop Streaming - Hadoop Pipes - Design of Hadoop Distributed File System - HDFS Concepts-Java Interface-Hadoop I/O.

UNIT - III MAPREDUCE APPLICATIONS 9

Map Reduce Applications - Mapreduce Workflows - Unit Tests With MRUnit - Test Data and Local Tests - Anatomy of Mapreduce Job Run - Failures in Classic Mapreduce and Yarn - Job Scheduling - Shuffle and Sort - Task Execution - Map Reduce Types.

UNIT - IV PIG, HIVE AND HBASE 9

Pig-Installing and Running Pig - An Example - Comparison with Databases - Pig Latin -Data Processing Operators – Hive - Installing Hive - An Example - Running Hive -Comparison with Traditional Databases – HiveQL – Tables - Querying Data – HBase – HBasics – Concepts – Installation – Clients - HBase versus RDBMS - Praxis.

UNIT - V DATA STREAMING AND HADOOP CLUSTERING 9

Mining Data Streams : Stream Data Model – Sampling Data in a Stream – Filtering Streams - Setting Up a Hadoop Cluster - Cluster Specification – Cluster Setup and Installation – Hadoop Configuration – Security – Benchmarking a Hadoop Cluster.

Total No. of Periods: 45

Course Outcomes:

CO1: Gain Knowledge about data and NoSQL Data Management
CO2: Ability to understand fundamental of Hadoop.
CO3: Design and Develop a simple Map Reduce Applications
CO4: Illustrate role of Pig, HIVE and HBase
CO5: Gain Knowledge on Data Streaming and Hadoop Clustering

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Chandrakant Naikodi "Managing the Big Data", Vikas Publishing House Pvt Ltd,New Delhi 2015.
2. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytic for Enterprise Class Hadoop and Streaming Data", McGraw-Hill Publishing, 2012
3. Tom White, "Hadoop: The Definitive Guide: Storage and Analysis At Internet Scale", Fourth Edition, Oreilly Media, 2015.
4. Anand Rajaraman and Jeffrey David Ullman, "Mining Massive Datasets", Cambridge University Press, 2012.
5. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John willey & sons 2012.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAT03 – BIG DATA MANAGEMENT	CO1	3				3							
	CO2		3	3									
	CO3		3	3									
	CO4					2							
	CO5	3				2							2
AVERAGE		**3.00**	**3.00**	**3.00**		**2.33**							**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

CORE ELECTIVE – III

320CAE01 - SERVICE ORIENTED ARCHITECTURE

Objectives :

- To Understand the fundamental concepts XML
- To Learn the basic Concept of Service Oriented Architecture
- To identify the service oriented analysis and design.
- To learn the importance of SOA Platforms.
- To build Web Service Extensions.

UNIT – I XML FUNDAMENTALS 9

XML – structuring with schema DTD – XML Schema – XML Processing DOM – SAX – Present XSL – Transformation XSLT – XPath – XQuery – XML Security and meta framework.

UNIT – II INTROUDICTION TO SOA 9

Roots of SOA – Characteristics of SOA – Anatomy of SOA – How components in an SOA interrelate – Principles of service orientation Messaging with SOAP – Message exchange Patterns – Coordination – Atomic Transactions– Business activities – Orchestration – Choreography – Service layer abstraction – Application Service Layer – Business Service Layer.

UNIT - III SERVICE ORIENTED ANALYSIS AND DESIGN 9

Service oriented analysis – Business-centric SOA–Deriving business services-service modeling –Service Oriented Design – WSDL basics–SOAP basics – SOA composition guidelines –Entity-centric business service design – Application service design – Task centric business service design.

UNIT - IV SOA PLATFORMS 9

SOA platform basics – SOA support in J2EE – Java API for XML based web services (JAX-WS) – Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) – Java API for XML based RPC (JAX-RPC) - Web Services Interoperability Technologies (WSIT) – SOA support in .NET.

UNIT - V WEB SERVICE EXTENSIONS 9

WS-BPEL basics – Process elements – PartnerLink elements – WS-Coordination overview – Coordination Context elements – Identifiers and expires elements – Coordination Type element – Registration service element – Security elements – Username Token – Username element.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course outcomes :

CO1: To learn about fundamental of XML.
CO2: Gain the knowledge about SOA.
CO3: Improve the analysis and design in SOA.
CO4: Experience in SOA Platform.
CO5: Design an Web Service Extension in an applications.

REFERENCES

1. Thomas Erl**, "**Service-Oriented Architecture : Concepts, Technology, and Design", Pearson Education, 2016.
2. Thomas Erl,"SOA Principles of Service Design"(The Prentice Hall Service - Oriented Computing Series from Thomas Erl), 2005.
3. Newcomer, Lomow,"Understanding SOA with Web Services", Pearson Education, 2005.
4. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services ,an Architect's Guide", Pearson Education,2007.
5. Dan Woodsand Thomas Mattern, "Enterprise SOA Designing IT for Business Innovation "O' REILLY, First Edition, 2006.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE01 - SERVICE ORIENTED ARCHITECTURE	CO1	3											
	CO2		3	3									
	CO3					2							
	CO4							2					
	CO5		3	3									1
AVERAGE		**3.00**	**3.00**	**3.00**		**2.00**		**2.00**					**1.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAE02 – ADVANCED JAVA SCRIPTING LANGUAGE

Course Objectives :

- Understand the Basic Concept of JavaScript
- Provide the conceptual understanding of JavasScript Object
- Obtain the fundamental knowledge of Angular JS
- To apply technical strategies of NodeJS and ReactJS

UNIT -I INTRODUCTION TO JAVASCRIPT 9

Fundamental of JavaScript – Types and Variable – Operators – Decision statement – Looping Statement – Branching Statement – Functions – Events – Form Handling.

UNIT –II JAVASCRIPT OBJECT 9

Introduction to JavaScript Object – Array- String – date – math – Number – Boolean – RegExp – DOM – Error and Exception Handling – Animation – Multimedia.

UNIT –III ANGULAR JS BASICS 9

Introduction to Angular JS – Directive and Expression – MVC- Filter: Create Filter – Built in Filter – Custom Filter – Module – Directives: Built in Directives – Create Directives – Custom Directives – Service – Server Communication – Organizing View

UNIT IV – NODE JS 9

Setting up Node JS- Understanding of Node JS – Core Node.JS – Node.JS Packages – Events and Stream – Getting Started with Http – Introducing Express- Persisting Data – Front End Basics

UNIT V – REACT JS 9

Introduction to React JS – The Core of React – React – Discovery of React Component – Understanding of Components – Component Properties and Methods – Component Lifecycle and Redundancy- JSX- JSX Fundamental – Built a React web application

Total No. of Periods : 45

Course Outcomes :

CO1: Provide the basic knowledge of JavaScript
CO2: Improve the technical aspects of JavaScript Object
CO3: Knowledge gained with fundamental of Angular JS
CO4: Improve the Technical Knowledge in Node JS
CO5: Ability to build a React web application

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Thomas Powell, Fritz Schneider, “The Javascript Completer Reference”, Third Edition, MCC GrawHill Publication, 2015
2. Andrew Grant, “Beginning Angular JS”, Apress publication, 2014.
3. Basarat Ali Syed, Beginning of Node JS”, Apress Publication, 2014.
4. Cory Gackenheimer, “Introduction to React”, Apress Publication, 2014.
5. Alex Banks and Eve Porcello, “Learning React Functional Web development with React”, SPD Publication, 2017.
6. Alex Young, Bradley Meck, Mike Cantelon, Tim Oxley, Marc Harter, T.J. Holowaychuk, Nathan Rajlich, “Node.js in Action”, second edition,2017
7. Nishu Goel, “Step-by-Step Angular Routing”, BPB Publication,2019

Course Name	CO’S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE02 – ADVANCED JAVA SCRIPTING LANGUAGE	CO1	3									3		
	CO2		3	3	3								
	CO3					2							
	CO4								2				
	CO5	3											2
AVERAGE		**3.00**	**3.00**	**3.00**	**3.00**	**2.00**			**2.00**		**3.00**		**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAE03 - AGILE SOFTWARE DEVELOPMENT

Objectives :

- Know the basic Constructs of Agile Software Development
- Understand agile software development practices
- Demonstrate Agile development and testing techniques
- Know the benefits and pitfalls of working in an Agile team

UNIT – I FUNDAMENTALS OF AGILE 9

The Genesis of Agile, Introduction and background, Agile Manifesto and Principles, Overview of Scrum, Extreme Programming, Feature Driven development, Lean Software Development, Agile project management, Design and development practices in Agile projects, Test Driven Development, Continuous Integration, Refactoring, Pair Programming, Simple Design, User Stories, Agile Testing, Agile Tools

UNIT – II AGILE SCRUM FRAMEWORK 9

Introduction to Scrum, Project phases, Agile Estimation, Planning game, Product backlog, Sprint backlog, Iteration planning, User story definition, Characteristics and content of user stories, Acceptance tests and Verifying stories, Project velocity, Burn down chart, Sprint planning and retrospective, Daily scrum, Scrum roles – Product Owner, Scrum Master, Scrum Team, Scrum case study, Tools for Agile project management

UNIT – III AGILE TESTING 9

The Agile lifecycle and its impact on testing, Test-Driven Development (TDD), xUnit framework and tools for TDD, Testing user stories - acceptance tests and scenarios, Planning and managing testing cycle, Exploratory testing, Risk based testing, Regression tests, Test Automation, Tools to support the Agile tester

UNIT – IV AGILE SOFTWARE DESIGN AND DEVELOPMENT 9

Agile design practices, Role of design Principles including Single Responsibility Principle, Open Closed Principle, Liskov Substitution Principle, Interface Segregation Principles, Dependency Inversion Principle in Agile Design, Need and significance of Refactoring, Refactoring Techniques, Continuous Integration, Automated build tools, Version control

UNIT - V INDUSTRY TRENDS 9

Market scenario and adoption of Agile, Agile ALM, Roles in an Agile project, Agile applicability, Agile in Distributed teams, Business benefits, Challenges in Agile, Risks and Mitigation, Agile projects on Cloud, Balancing Agility with Discipline, Agile rapid development technologies

Course Outcomes :

CO1: Understand Agile development using Test Driven Development
CO2: Understand the Agile Scrum framework.
CO3: Perform testing activities within an Agile project
CO4: Apply design principles and refactoring to achieve Agility
CO5: Deploy automated build tools, version control and continuous integration

REFERENCES

1. Agile Software Development with Scrum By Ken Schawber, Mike Beedle Pearson Publisher, 1st Edition, 2001.
2. Agile Testing: A Practical Guide for Testers and Agile Teams By Lisa Crispin, Janet Gregory, Addison Wesley Publisher, 1st Edition, 2009.
3. Agile Software Development, Principles, Patterns and Practices By Robert C. Martin, Prentice Hall Publisher, 1st Edition, 2006.
4. Agile Software Development: The Cooperative Game By Alistair Cockburn Addison Wesley Publisher, 2nd Edition, 2008.
5. User Stories Applied: For Agile Software By Mike Cohn Publisher: Addison Wesley, 1st Edition, 2004.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE03 - AGILE SOFTWARE DEVELOPMENT	CO1	3											
	CO2	3											
	CO3					3							
	CO4	3	3	3									
	CO5	3											2
AVERAGE		**3.00**	**3.00**	**3.00**		**3.00**							**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAE04 – MACHINE LEARNING TECHNIQUES

Course Objectives

- Understand basic concepts and techniques of Machine Learning.
- Insight of Supervised Learning.
- Understand the Concept of Unsupervised Learning
- Study various Probabilistic Graphical Models of Machine Learning Algorithms.
- Learn Reinforcement and Computational Learning techniques.

UNIT - I INTRODUCTION 9

Introduction to Machine Learning - Types of Machine learning - Basic Concepts in Machine Learning - Examples of Machine Learning Applications - Linear Models for Regression - Linear Basis Function Models - The Bias-Variance Decomposition - Bayesian Linear Regression - Bayesian Model Comparison.

UNIT - II SUPERVISED LEARNING 9

Linear Models for Classification: Discriminant Functions - Probabilistic Generative Models - Probabilistic Discriminative Models - Bayesian Logistic Regression. Neural Networks: Feed-forward Network Functions - Error Backpropagation – Regularization in Neural Networks - Mixture Density Networks - Bayesian Neural Networks. Kernel Methods - Dual Representations - Radial Basis Function Networks - Ensemble learning: Boosting - Bagging.

UNIT - III UNSUPERVISED LEARNING 9

Clustering - K-means - Mixtures of Gaussians - The EM Algorithm in General – Model Selection for Latent Variable Models - High-Dimensional Spaces. Dimensionality Reduction: Factor analysis - Principal Component Analysis - Probabilistic PCA - Independent components analysis.

UNIT - IV PROBABILISTIC GRAPHICAL MODELS 9

Directed Graphical Models: Introduction - Bayesian Networks - Examples – Naive Bayes classifiers - Markov Models – Hidden Markov Models – Inference – Learning - Conditional independence properties of DGMs. Undirected graphical models: Markov random fields - Conditional independence properties - Parameterization of MRFs – Examples of MRF - Learning - Conditional random fields (CRFs) - Structural SVMs.

UNIT - V ADVANCED LEARNING 9

Sampling – Basic Sampling Methods – Monte Carlo. Reinforcement Learning: K-Armed Bandit - Elements of Reinforcement Learning - Model-Based Learning. Temporal Difference Learning - Exploration Strategies - Deterministic and Non-deterministic Rewards and Actions - Eligibility Traces – Generalization - Partially Observable States - The Setting - Example. Computational Learning Theory - Mistake bound analysis, sample complexity analysis, VC dimension. Occam learning - accuracy and confidence boosting.

Total: 45 periods

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes

CO1: Develop learning models from data.
CO2: Distinguish and apply supervised algorithm for any given problem.
CO3: Distinguish and apply unsupervised algorithm for any given problem.
CO4: Design and implement systems that uses the appropriate graph models and sequence model of machine learning.
CO5: Modify existing machine learning algorithms to improve classification efficiency.

REFERENCES:

1. EthemAlpaydin, "Introduction to Machine Learning", 2nd Edition, Prentice Hall of India, 2010.
2. Christopher M. Bishop, "Pattern Recognition and Machine Learning", Springer, 2006.
3. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012.
4. Stephen Marsland, "Machine Learning – An Algorithmic Perspective", CRC Press, 2011. Tom Mitchell, "Machine Learning", McGraw-Hill, 1997.
5. Hastie, Tibshirani, Friedman, "The Elements of Statistical Learning", 2nd Edition, Springer, 2008.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE04 – MACHINE LEARNING TECHNIQUES	CO1	3	3										
	CO2	3			2								
	CO3	3			2	2							
	CO4		3	2									1
	CO5							3					
AVERAGE		**3.00**	**3.00**	**2.00**	**2.00**	**2.00**		**3.00**					**1.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAE05 – INTERNET OF THINGS

Objectives :

- Vision and Introduction to IoT.
- Understand IoT Market perspective.
- Data and Knowledge Management and use of Devices in IoT Technology.
- Understand State of the Art – IoT Architecture.
- Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.

UNIT - I M2M to IoT 9

The vision – Introduction, M2M towards IoT - the Global context, a use case example, differing characteristics.

UNIT - II M2M to IoT –A MARKET PERSPECTIVE 9

Introduction, some definitions, M2M Value chains, IoT value chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies **– An Architectural Overview** – Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

UNIT - III M2M and IoT TECHNOLOGY FUNDAMENTALS 9

Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a service (XaaS), M2M and IoT Analytics, Knowledge Management.

UNIT - IV IoT ARCHITECTURE –STATE OF THE ART 9

Introduction, state of the art, **Architecture Reference Model** and architecture, IoT references Model – Functional View – Information View – Deployment and operational view.

UNIT - V IoT REFERNCE ARCHITECTURE 9

Real – World Design Constraints – Introduction, Technical Design constraints – Data representation and visualization, interaction and remote control. - IoT Platform : Raspberry Pi Interface - **Commercial Building automation** - Introduction, case study: phase one – commercial building automation today, case study: phase two – commercial building automation in the future.

Total No. of Periods : 45

Course Outcomes :

CO1: Understand the vision of IoT from a global context.
CO2: Determine the Market perspective of IoT.
CO3: Use of Devices, Gateways and Data Management in IoT.
CO4: Building state of the art architecture in IoT.
CO5: Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.
2. Vijay Madisetti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014.
3. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013
4. Samvel Greengard, 'The Internet of Things, MIT Press Esential Knowldege Series, Paperback,2015.
5. Olivier Hersent , David Boswarthick, Omar Elloumi , "The Internet of Things –Key applications and Protocols", Wiley, 2012

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE05 – INTERNET OF THINGS	CO1	3											
	CO2					3							
	CO3								3				
	CO4									3	2		
	CO5	3											1
AVERAGE		**3.00**				**3.00**			**3.00**	**3.00**	**2.00**		**1.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

OPEN ELECTIVE – III

320CAE06 - PROFESSIONAL COMMUNICATION

Objectives :

- To facilitate students amplify suitable language skills for academic and professional purposes
- To inculcate and develop strategies to understand and to increase students' efficiency in their academic and general reading
- To strengthen students' vocabulary power
- To familiarize students with different functions of technical and scientific English
- To coach the students in augmenting the technical writing skills like writing letters and reports in formal and business situations
- To strengthen Students' Creative skill

UNIT – I BASICS OF TECHNICAL COMMUNICATION 9

Technical Communication – features - Distinction between General and Technical communication - Language as a tool of communication - Levels of communication: Interpersonal, Organizational, Mass communication - The flow of Communication: Downward, Upward, Horizontal, Diagonal - Importance of technical communication - Barriers to Communication.

UNIT – II CONSTITUENTS OF TECHNICAL WRITTEN COMMUNICATION 9

Word formation - Synonyms and Antonyms – Acronyms – Homonyms - Word Power - Select vocabulary of about 500- 1000 New words – Odd man Out – Jumbled Words and Sentences- Creative and Critical Thinking - Requisites of Sentence Construction - Paragraph Development: Techniques and Methods - Inductive, Deductive, Spatial, Linear, Chronological etc; Essay Writing – Narrative – Argumentative - Reading and Interpretation.

UNIT – III FORMS OF TECHNICAL COMMUNICATION 9

Business Letters: Sales and Credit letters - Letter of Enquiry - Letter of Quotation, Order, Claim and Adjustment Letters - Job application and Resumes - Reports: Types – Significance – Structure - Style & Writing of Reports – Agenda – Minutes of Meeting – Advertisement – Fliers – Brochures – Faxes – Internet Websites – Intranet Websites – Extranet Websites – Blogging.

UNIT – IV PRESENTATION STRATEGIES 9

Defining Purpose Analyzing Audience & Locale - Organizing Contents - Modes of Delivery: Extemporaneous, Manuscript, Impromptu, Memorization - Kinesics – proxemics – Paralinguistics – Chronemics.

UNIT – V CAREER SKILLS 9

Transfer of Information: Pie Chart, Bar Chart, Flow Chart - Check List – Recommendation – Instruction - E-mail Writing – Verbal Analogy – HR Questions – Theme Detection – Deriving conclusions from Passages.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course outcomes :

CO1: The ability to strengthen technical writing and speaking
CO2: The ability to be proactively read, listen, speak and present facts in a persuasive manner in both oral and written medium
CO3: The ability to interact, translate and delegate information,
CO4: The ability to face various levels of competitive examinations to upgrade educational and career options
CO5: The ability to face any challenge in the work environment.

REFERENCES

1. Effective Technical Communication by Barun K. Mitra, Oxford Univ. Press, 2006, New Delhi.
2. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., New Delhi, 2002.
3. How to Build Better Vocabulary by M.Rosen Blum, Bloomsbury Pub. London, 1989.
4. Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors; Delhi, 2011.
5. Developing Communication Skills by Krishna Mohan, Meera Banerji- Macmillan India Ltd. Delhi, 2000.
6. Manual of Practical Communication by L.U.B. Pandey & R.P. Singh; A.I.T.B.S. Publications India Ltd., Krishan Nagar, Delhi, 2013.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE06 - PROFESSIONAL COMMUNICATION	CO1							2	3				
	CO2								2	2			
	CO3								2			3	
	CO4									2	2		
	CO5						3	3					
AVERAGE							**3.00**	**2.5**	**2.33**	**2.00**	**2.00**	**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAE07 - RESOURCE MANAGEMENT TECHNIQUES

Objectives:

- To provide the concept and an understanding of basic concepts in Operations Research Techniques for Analysis and Modeling in Computer Applications.
- To understand, develop and solve mathematical model of linear programming problems
- To understand, develop and solve mathematical model of Transport and assignment problems
- To Understand network modeling for planning and scheduling the project activities

UNIT - I LINEAR PROGRAMMING 9

Principal components of decision problem – Modeling phases – Linear Programming Formulation and Graphical solution – Resource allocation problems – Simplex method – Sensitivity analysis.

UNIT - II DUALITY AND NETWORKS 9

Definition of dual problem – Primal – Dual relationships – Dual simplex methods – Post optimality analysis – Transportation and Assignment model - Shortest route problem.

UNIT - III INTEGER PROGRAMMING 9

Cutting plane algorithms – Branch and bound methods. Multistage (Dynamic) programming.

UNIT – IV GAME THEORY AND SEQUENCING 9

Game Theory – Two person Zero sum games – Saddle point, Dominance Rule- Convex Linear Combination(Averages), Graphical and LP solutions. Sequencing – Sequencing of ‘n’ jobs and ‘2’ machines ,‘n’ jobs and ‘3’ machines and ‘n’ jobs and ‘m’ machines.

UNIT - V OBJECT SCHEDULING 9

Network diagram representation – Critical Path Method (CPM) – Time charts and resource leveling – PERT-Minimal spanning tree-Shortest route.

Total No. of Periods: 45

Course Outcomes:

CO1: Understand and apply linear, integer programming to solve operational problem with constraints

CO2: Apply transportation and assignment models to find optimal solution in warehousing and Travelling,

CO3: To prepare project scheduling using PERT and CPM

CO4: Identify and analyze appropriate queuing model to reduce the waiting time in queue.

CO5: Able to use optimization concepts in real world problems

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. Hamdy A Taha, Introduction to Operations Research, Prentice Hall India, 7th Edition, 3rd Indian reprint, 2010.
2. Paneerselvam . R, "Operations Research", PHI Learning, New Delhi, 2013.
3. Kalavathy .S. Operations Research, 2nd edition, Vikas Publishing House, 2013.
4. G.Srinivasan, Operations Research – Principles and Applications, PHI, 2012.
5. Gupta P.K, Hira..D.S., Problem in Operations Research, S.Chand and Co, 2011.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE07 - RESOURCE MANAGEMENT TECHNIQUES	CO1	3											
	CO2	3			3								
	CO3	3				3							
	CO4	3			2								
	CO5	3											2
AVERAGE		**3.00**			**2.5**	**3.00**							**2.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAE08 - AD HOC AND SENSOR NETWORKS

Objectives :

- Understand the design issues in Ad Hoc and sensor networks.
- Learn the different types of MAC protocols.
- Be familiar with different types of Ad Hoc routing protocols.
- Be expose to the Wireless Sensor Networks
- Understand the functionalities of Hybrid Wireless Networks.

UNIT – I AD HOC MAC 9

Introduction – Cellular and Ad hoc Wireless Networks – Applications of Ad Hoc Wireless Networks – Issues in Ad Hoc Wireless Networks – Ad Hoc Wireless Internet - MAC Protocols for Ad Hoc Wireless Networks – Issues, Classification of MAC Protocols.

UNIT – II CONTENTION BASED PROTOCOLS & MECHANISMS 9

Contention-Based Protocols with Reservation Mechanisms – Contention- Based MAC Protocols with Scheduling Mechanisms – MCA Protocols that use Directional Antennas – Other MAC Protocols.

UNIT – III ROUTING PROTOCOLS 9

Issues in designing a Routing Protocol – Classification of Routing Protocols – Table-Driven Routing Protocols – On-Demand Routing Protocols – Hybrid Routing Protocols – Routing Protocols with Efficient Flooding Mechanisms – Hierarchical Routing Protocols- Power-Aware Routing Protocols.

UNIT – IV WIRELESS SENSOR NETWORKS 9

Sensor Network Architecture – Data Dissemination – Data Gathering – MAC Protocols for Sensor Networks – Location Discovery – Quality of a Sensor Network – Evolving Standards – Other Issues.

UNIT – V HYBRID WIRELESS NETWORKS 9

Next Generation Hybrid Wireless Architectures – Routing in Hybrid Wireless Networks – Pricing in Multi-Hop Wireless Networks – Power Control Schemes in Hybrid Wireless Networks – Load Balancing in Hybrid Wireless Networks.

Total No. of Periods: 45

Course outcomes :

CO1: Gain the Knowledge of Ad-hoc Networks
CO2: Analysis about Contention based protocol and mechanisms
CO3: Ability to understand about the routing protocols
CO4: Gain knowledge in Wireless Sensor Networks
CO5: Implementation of Hybrid Wireless Networks.

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

REFERENCES

1. C.Siva Ram Murthy and B.S.Manoj,"Ad Hoc Wireless Networks–Architectures and Protocols", Pearson Education, 2004.
2. Carlos De Morais Cordeiro and Dharma Prakash Agarwal "Ad Hoc Sensor Networks Theory and Applications", 2nd Edition, World Scientific Publishers, 2011.
3. Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan Kaufman Publishers, 2004.
4. Hai Liu, "Ad Hoc and Sensor Wireless Networks: Architectures, Algorithms and Protocols", Ed. 2nd Bentham Science Publishers, 2018.
5. Thomas Krag and Sebastin Buettrich, "Wireless Mesh Networking", O'Reilly Publishers, 2007.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE08 - AD HOC AND SENSOR NETWORKS	CO1	3											
	CO2		3	3									
	CO3	3			2								
	CO4					2							
	CO5					2							
AVERAGE		**3.00**	**3.00**	**3.00**	**2.00**	**2.00**							

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

318CAE09 - HUMAN RESOURCE MANAGEMENT

Objectives :

- To equip students with knowledge, skill and competencies.
- To manage people along with capital, material, information and knowledge asset in the organization.
- To provide a basic legal and conceptual framework for managers.
- To introduce the practices and techniques for evaluating performance, structuring teams, coaching and mentoring people, and performing the wide range of other people related duties of a manager in today's increasingly complex workplace.
- To provide students logic and rationale to make fundamental choice about their own assumption and belief in dealing with people.

UNIT - I INTRODUCTION TO HRM 9

Meaning, Scope, Definition and Objectives of HRM –Importance of human factor-Challenges-Inclusive growth and Affirmative action- Functions of HRM and Models of HRM - Activities and Challenges of HRM - Role of HR Manager - Human Resource Policy - HRM as Linked to Environmental changes.

UNIT - II HUMAN RESOURCE PLANNING &RECRUITMENT, SELECTION 9

HR Planning process - Job analysis, Job description & Job specification - Job Rotation, Job enlargement & Job enrichment - Job evaluation – RECRUITMENT: - Recruitment -Process & Methods of Recruitment. SELECTION: - Selection process - type of tests & types of interviews - Designing and conducting the effective interview - Induction and Placement.

UNIT - III WAGE AND SALARY ADMINISTRATION & APPRAISING AND MANAGING PERFORMANCE 9

Principles and techniques of wage fixation - Incentive schemes and plans. Appraisal process, methods, and potential problems in performance evaluations, Traditional Modern methods - Potential Appraisal - Methods to improve performance - Career Planning and Development.

UNIT - IV TRAINING AND EXECUTIVE DEVELOPMENT 9

Nature of Training – Methods of Training – Training Need Analysis- Training Design – Training Evaluation-Management Development –Succession Planning-Coaching.

UNIT - V RECENT TRENDS IN HR 9

HR outsourcing - Managing Attrition and Retention - Collective Bargaining - Grievance Management - Quality of work life – HR Accounting and Audit – Whistle Blowing – Employee poaching - HRIS- Diversity of Workforce Programs.

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course Outcomes:

CO1: Explain the importance of human resources and their effective management in organizations.
CO2: Elucidate the Enhanced recruitment activities and better training and development programme.
CO3: Demonstrate a basic understanding of different tools used in forecasting and planning human resource needs.
CO4: Expose the knowledge on wage and salary administration & appraising and managing performance.
CO5: Analyse the key issues related to administering the human elements such as motivation, compensation, appraisal, career planning, diversity, ethics, and training.

REFERENCES

1. K.Aswathappa Human Resource Management TMH, 2017.
2. Dessler Human Resource Management, Pearson Education Limited, 2017
3. Luis R.Gomez-Mejia, David B.Balkin, Robert L Cardy. Managing Human Resource. PHI Learning. 2015 2. Bernadin, Human Resource Management, Tata Mcgraw Hill, 14th edition 2015
4. Scott Snell & George Bohlander Human Resource Management Thomson Learning 2009.
5. VSP Rao Human Resource Management -2016.
6. Raymond A. Noe John R. Hollenbeck Patrick M Wright Human Resource Management – Gaining a competitive advantage TMH 2007.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
318CAE09 - HUMAN RESOURCE MANAGEMENT	CO1							3					
	CO2							3	3				
	CO3									3			
	CO4											3	
	CO5										3		
AVERAGE								**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
3	0	0	3

320CAE10 - FINANCIAL DERIVATIVES

Objectives :

- To describe the characteristics of the relevant financial derivative instruments.
- To understand the operational mechanisms in derivatives.
- To explain how the instruments covered can be used to implement basic market risk management strategies, appropriate for corporate applications.
- Explain the use of options and futures contracts for tactical portfolio strategies purpose.
- To know various types of risks pertaining to derivatives.

UNIT - I INTRODUCTION 9

Derivative Markets and Instruments, some important concepts in financial and derivative markets, fundamental linkages between spot and derivatives markets, the role of derivative markets, Criticisms, misuses, sources of information on derivatives.

UNIT – II OPTIONS 9

The development of options Markets, organized Options Trading, Options Traders, Mechanics of Trading, Types, Pricing, Options Pricing Models – Binomial Model, Black Scholes Model, Basic Option Strategies.

UNIT – III FORWARDS AND FUTURES 9

The Development of Forward and Future Markets, Organized Future Trading, Exchanges, Traders, The mechanics of future trading, Types of future Contracts, properties of Forward and future prices, Forward and Pricing Model, Pricing option on futures, Forward and Future Hedging Strategies.

UNIT – IV SWAPS 9

Interest rate swaps, currency swaps, equity swaps, beyond simple interest rate swaps, case study: forward rate agreements, interest rate options, interest rate swapping and Forward Swaps.

UNIT - V RISK IN DERIVATIVES 9

Practice Risk Management, Managing market risk, managing credit risk, managing risk in an organization – Overview of Cash Market in Indian financial system.

Total No. of Periods : 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course outcomes :

CO1: Provide an in-depth understanding of financial derivatives in terms of concepts, structure, instruments and trading strategies for profit and risk management.

CO2: Understand how financial derivatives are valued based on no arbitrage pricing arguments and risk-neutral valuation methods.

CO3: Understand how the instruments covered can be used to implement basic market risk management strategies, appropriate for corporate applications.

CO4: Be able to solve basic problems requiring the ability to price derivative instruments and hedge market risk based on numerical data and current market conventions.

CO5: Focus on various types of risks in derivatives and knowledge on Indian Financial System.

REFERENCES

1. Don M, Chance, "An Introduction to derivatives & Risk Management", 9th Edition, Thomson South Western, 2012.
2. Rene M. Stulz "Risk Management & Derivatives", Thomson South Edition, 2002.
3. Mark S. Dorfman, Introduction to risk Management and Insurance, 10th Edition, Prentice Hall of India, 2011.
4. George E. Redja, Principles of Risk Management and Insurance, Pearson Education, 8th Edition, 2009.
5. Nalini Prave Tripathy, and Prabir Pal, Insurance – Theory and Practices, Prentica Hall of India, 2010.
6. V. K. Bhalla, "Financial Derivatives and Risk Management" S. Chand & Company, 2001.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAE10 - FINANCIAL DERIVATIVES	CO1						3						
	CO2									3			
	CO3										3		
	CO4								3				
	CO5											3	
AVERAGE							**3.00**		**3.00**	**3.00**	**3.00**	**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

LAB ELECTIVE – III

320CAL01 – WEB PROGRAMMING LAB

Objectives :

- To understand the core PHP concepts of.
- To understand the types of PHP array and functions
- To learn the concepts GET / POST of form handling.

LIST OF EXPERIMENTS

1. Implement
    a. Array Types
    b. String function
    c. Date function
    d. User Defined function
2. Design a User Registration Form and display the user information in another form (Use GET/POST).
3. Design any simple Web Application using PHP and MYSQL
4. Design a Responsive Web Page using PHP.
5. Set Cookies and Retrieve the same in another page.
6. Practice Session Handling in PHP.
7. Implement File Concept in PHP.
8. PHP code for sign in.
9. PHP code for File Upload, PHP code for Import / Export using any Framework.

Total No. of Periods: 45

Course outcomes :

CO1: Can able to work with PDO PHP code
CO2: Can able to work with query manipulations.
CO3: Can able to work with new frameworks like Larvel and Codeignter.
CO4: Can able to work with dynamic base applications

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAL01 – WEB PROGRAMMING LAB	CO1	3											
	CO2		3	3									
	CO3		3	3									
	CO4												3
AVERAGE		**3.00**	**3.00**	**3.00**									**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

320CAL02 - MOBILE APPLICATION DEVELOPMENT LAB

Objectives:

- To know about various Controls, Views and activity for developing mobile applications.
- To Implement various resources like video, image, mobile call, SMS etc.,
- To Deploy Database for Mobile Applications
- To Deploy interactive Mobile Application and MVC Framework

LIST OF EXPERIMENTS

1. Design a simple Mobile Application using Button Control
2. Design a User Registration Form
3. Implement built in application using intent
4. Display notification on the Status Bar
5. Design Image and video album
6. Design a simple application using database
7. Design an application using Menus with Views
8. Implement notification through
   a. SMS
   b. E–Mail
   c. Location based services
9. Display text using iOS.
10. Create an interactive iOS application.

Total No. of Periods : 45

Course outcomes :

CO1: Getting Practices with controls, views and activities
CO2: Knowledge about various resources
CO3: Create application with database connection
CO4: Be able to develop useful mobile applications for the current scenario.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAL02 - MOBILE APPLICATION DEVELOPMENT LAB	CO1	3											
	CO2					3							
	CO3	3											3
	CO4	3											3
AVERAGE		**3.00**				**3.00**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

320CAL03 – MACHINE LEARNING TECHNIQUES LAB

Objectives:

- Understanding the fundamental of python and R-Programming
- Design and Implements Prediction / Classification Process
- Design and implement Clustering algorithm
- Ability to develop a game and traffic control system using reinforcement learning.

LIST OF EXPERIMENTS

1. Implement a classifier for the sales data.
2. Develop a predictive model for predicting house prices
3. Implement the FIND-S algorithm. Verify that it successfully produces the trace in for the Enjoy sport example.(Tom Mitchell Reference)
4. Implement a decision tree algorithm for sales prediction/classification in retail sector
5. Implement back propagation algorithm for stock prices prediction
6. Implement clustering algorithm for Insurance fraud detection
7. Implement clustering algorithm for identifying cancerous data
8. Apply reinforcement learning and develop a game of your own.
9. Develop a traffic signal control system using reinforcement learning technique.

Total No. of Periods : 45

Course outcomes :

CO1: Apply various classification and clustering techniques for problems using tools like R and Python.
CO2: Implement solutions for various prediction problems using tools.
CO3: Design and development of game and traffic control system using reinforcement learning.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAL03 – MACHINE LEARNING TECHNIQUES LAB	CO1	3	3	3									
	CO2					3							
	CO3	3	3	3									3
AVERAGE		**3.00**	**3.00**	**3.00**		**3.00**							**3.00**

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

EMPLOYABLITY ENHANCEMENT COURSE

320CAL04 – EXECUTIVE COMMUNICATION LAB

Objectives :

- To equip students with effective receptive and productive skills in English.
- To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.
- To enhance the performance of the students at Placement Interviews, Group Discussions and other recruitment exercises.

LIST OF EXPERIMENTS

1. Introduction – Soft Skills**:**

Team Skills: Team Building and Leadership, Evolution of Groups Into Teams, Group Dynamics, Emergence Of Leadership, Intra-Group Dynamics, Inter-Group Dynamics, Conflict Management, Inter Dependency, Assessment of Team-Based Projects.
Time Management: Goal Setting, Effective Time Management.
Interpersonal Skills: Negotiations, Listening Skills, Social Skills, Assertive Skills, Cross-Cultural Communications, Organizing functions and Meetings
Leadership Skills: Concepts of Leadership, Leadership Styles, Insights from Great Leaders.
Soft skills – video clips

2. Listening Comprehension:
   a) Phonetics
   b) Conversations – video clips

3. Reading comprehension:

4. Presentation skills – video clips
   Preparing For Effective Presentations,
   Presentation For Small Groups And Large Groups,
   Marketing And Business Presentations
5. Body language: Importance of Non-Verbal Communication

6. Training in Group Discussion and Personal Interview
   Training in Group Discussion (GD),
   Interview Skills,
   Interview FAQ's,
   Mock Interview.

7. Resume / Letter writing/E-Mail Etiquettes

8. Report preparation

9. Grammar: Concord, Error Correction, Editing etc.,

Total No. of Periods: 45

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

Course outcomes :

CO1: The ability to strengthen technical writing and speaking
CO2: The ability to be proactively read, listen, speak and present facts in a persuasive manner in both oral and written medium
CO3: The ability to interact, translate and delegate information
CO4: The ability to face various levels of competitive examinations to upgrade educational and career options

REFERENCES

1. Andrea J. Rutherford, **"**Basic Communication Skills for Technology", 1st Edition, Pearson Education Asia (Singapore) Pvt. Ltd., Bangalore, 2001.
2. Bhatia R.C., "Business Communication", Ane Books India, New Delhi, 2008.
3. Raman, Meenakshi and Sangeetha Sharma, "Technical Communication – English Skills for Engineers", 2nd Edition. Oxford University Press, New Delhi, 2009.
4. Ashraf M Rizvi, "Effective Technical Communication", 5th Edition, The McGraw-Hill Publishing Company Ltd., New Delhi, 2007.
5. Mohan Krishna Banerjee Developing Communications Skills Macmillan India Ltd. 2009.

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAL04 – EXECUTIVE COMMUNICATION LAB	CO1							3					
	CO2									3			
	CO3								3				
	CO4										3	3	
AVERAGE								**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130

L	T	P	C
0	0	3	2

320CAL05 - REPORT WRITING PRACTICE LAB

Objectives :

- To Provide fundamental concept of Report Preparation
- To Gain Knowledge about Writing Tool
- To Practice a Report Writing for an application Project
- To Implement the concept of Thesis Writing

LIST OF EXPERIMENTS

1. Use of MS Word and Latex for report preparation.
2. Use of Excel for graphs
3. Use of open source report writing tools
4. Report Writing for an application project on any one of the following;
    - Student Information System
    - Banking Operation
    - Admission System
    - Railway reservation System
5. Header, Body computation and Footer generation for Reports.
6. Thesis writing:
    - Introduction on Problems
    - Literature survey – Existing work
    - Architecture Design
    - Algorithms and Implementation
    - Presentation and results
    - Writing Conclusion
    - Display of Reference

Total No. of Periods: 45

Course outcomes :

CO1: Acquire Language Skills required to Write Reports
CO2: Explore Knowledge in Report Writing Tools
CO3: Able to Write a Report for an Application Projects
CO4: Known about Thesis Writing

Course Name	CO'S	Program outcomes (Washington Accord Attributes)											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
320CAL05 –REPORT WRITING LAB	CO1							3					
	CO2									3			
	CO3								3	3			
	CO4										3	3	
AVERAGE								**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	

G RANGANATH

Digitally signed by G RANGANATH
DN: C=IN, O=PERSONAL, T=5743, OID.2.5.4.65=477ffb4dbbd048fca3ebc0819eac5932, Phone=52395e01ffcfdff207f2ee203111911d02facc9c55479d3d2d69ce80f3fdcbd3, PostalCode=635109, S=Tamil Nadu, SERIALNUMBER=fd0cabc4c841372f49b7553888e0d3fd2a47f2d77abb2bc845fe5200c1fb253, CN=G RANGANATH
Reason: I am the author of this document
Location:
Date: 2023-01-12 15:00:14

PRINCIPAL
Adhiyamaan College of Engineering (Autonomous),
Dr. M.G.R. Nagar, HOSUR - 635130