

Department of Computer Science and Engineering

R19 B. Tech. CSE

I B. Tech. I Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	HS	19AC15T	Functional English and Life Skills	3	0	0	3
2	BS	19AC14T	Engineering Chemistry	2	1	0	3
3	BS	19AC11T	Algebra and Calculus	3	1	0	4
4	ES	19A511T	Problem Solving and C Programming	3	0	0	3
Lab Courses							
5	BS	19AC14L	Engineering Chemistry Lab	0	0	3	1.5
6	ES	19A511L	C Programming Lab	0	0	3	1.5
7	HS	19AC15L	Communicative English Lab	0	0	3	1.5
8	ES	19A512L	IT Workshop	0	0	2	1
9	MC	19AC16T	Environmental Science	3	0	0	0
				14	02	11	18.5

I B. Tech. II Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	ES	19A221T	Basic Electrical & Electronics Engineering	3	0	0	3
2	ES	19A324T	Engineering Graphics & Design	1	0	3	2.5
3	ES	19A521T	Python Programming	3	0	0	3
4	BS	19AC22T	Applied Physics	2	1	0	3
5	BS	19AC21T	Differential Equations and Vector Calculus	3	1	0	4
Lab Courses							
6	ES	19A221L	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5
7	ES	19A521L	Python Programming Lab	0	0	3	1.5
8	BS	19AC22L	Applied Physics Lab	0	0	3	1.5
9	ES	19A325L	Engineering Workshop and Advanced IT Workshop	0	0	3	1.5
				12	02	15	21.5

II B. Tech. I Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	19A531T	Database Management Systems	3	0	0	3
2	PC	19A532T	Data Structures through Python	3	0	0	3
3	PC	19A533T	Digital Logic Design and Computer Organization	3	0	0	3
4	BS	19AC33T	Discrete Mathematics	3	0	0	3
5	PC	19A534T	Web Programming	2	0	0	2
6	BS	19AC34T	Life Sciences for Engineers	2	0	0	2
7	MC	19AC37T	Constitution of India	3	0	0	0
Lab Courses							
8	PC	19A531L	Database Management Systems Lab	0	0	2	1
9	PC	19A532L	Data Structures through Python Lab	0	0	3	1.5
10	PC	19A534L	Web Programming Lab	0	0	2	1
				18	0	9	19.5

Department of Computer Science and Engineering

II B. Tech. II Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	BS	19AC43T	Probability and Statistics	2	1	0	3
2	PC	19A541T	Artificial Intelligence	3	0	0	3
3	PC	19A542T	Design and Analysis of Algorithms	3	0	0	3
4	PC	19A543T	Formal Languages and Automata Theory	3	0	0	3
5	PC	19A544T	Object Oriented Programming Using Java	3	0	0	3
6	PC	19A545T	Operating Systems	3	0	0	3
7	PC	19A546T	Software Engineering	3	0	0	3
Lab Courses							
8	PC	19A542L	Design and Analysis of Algorithms Lab	0	0	2	1
9	PC	19A544L	JAVA Lab	0	0	2	1
10	PC	19A547L	Operating Systems Lab and Artificial Intelligence Lab	0	0	3	1.5
11	MC	19AC45T	Essence of Indian Traditional Knowledge	3	0	0	0
				23	1	8	24.5

III Year I Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	19A551T	Advanced JAVA Programming	3	-	-	3
2	PC	19A552T	Computer Networks	3	-	-	3
3	PC	19A553T	Data Warehousing & Data Mining	3	-	-	3
4	PE	19A55AT	Advanced Databases	3	-	-	3
		19A55BT	Artificial Neural Networks				
		19A55CT	Cryptography & Network Security				
		19A55DT	Principles of Programming Languages				
5	PE	19A55ET	Distributed Systems	3	-	-	3
		19A55FT	Computer Graphics				
		19A55GT	Linux Programming				
		19A55HT	Software Project Management				
6	OE	19A55IT	Cloud Computing	3	-	-	3
		19A55JT	Cyber Security				
		19A55KT	Human Computer Interaction				
		19A55LT	R Programming				
Lab Courses							
7	HS	19AC51L	General Aptitude	-	-	2	1
8	PC	19A551L	Advanced JAVA Programming lab	-	-	2	1
9	PC	19A554L	Data Mining and Computer Networks Lab	-	-	2	1
10	HS	19AC53T	Universal Human Values – II	1	1	0	2
				19	1	6	23

Department of Computer Science and Engineering

III Year II Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	ES	19A461T	Microprocessor & Interfacing	3	-	-	3
2	PC	19A561T	Compiler Design	3	-	-	3
3	PC	19A562T	Object Oriented Analysis and Design	2	-	-	2
4	PE	19A56AT	.Net Technologies	3	-	-	3
		19A56BT	Machine Learning				
		19A56CT	Mobile Communications				
		19A56DT	Performance Evaluation of Computer Systems				
5	PE	19A56ET	Advanced Computer Architecture	3	-	-	3
		19A56FT	High Performance Computing				
		19A56GT	Software Testing Methodologies				
		19A56HT	Visual programming				
6	OE	19A16GT	Basic Civil Engineering	3	-	-	3
		19A16HT	Water Resources and Conservation				
		19A26GT	Energy Management and Conservation				
		19A26HT	Fuzzy Logic and Neural Networks				
		19A36ET	Introduction to Mechatronics				
		19A36FT	Fundamentals of Robotics				
		19A36GT	Non-Conventional Sources of Energy				
		19A46GT	Electronic Circuits and Its Applications				
19A46HT	Basics of Communication Systems						
Lab Courses							
7	ES	19A461L	Microprocessor & Interfacing & Compiler Design Lab	-	-	3	1.5
8	PC	19A563L	Mobile Application Development lab	-	-	2	1
9	HS	19AC62L	Professional Communication Skills Lab	-	-	3	1.5
10	INTERN	19A564I	Innovative project / Socially relevant project / Entrepreneurship / Internship	-	-	-	2
				17	0	12	23

IV Year I Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	PC	19A571T	Advanced Web Programming	2	-	-	2
2	PC	19A572T	Internet of Things	2	-	-	2
3	HS	19A373T	Management Science	3	-	-	3
4	PE	19A57AT	Big Data	3	-	-	3
		19A57BT	Deep Learning				
		19A57CT	Design Patterns				
		19A57DT	Mobile Ad hoc Networks				
5	OE	19A57GT	OE-3 (MOOC)	3	-	-	3
Lab Courses							
7	PC	19A571L	Advanced Web Programming Lab	-	-	3	1.5
8	PC	19A573L	IoT& CASE Tools Lab	-	-	3	1.5
9	PW	19A574P	Project Phase-I	-	-	-	2
				13	0	06	18

Department of Computer Science and Engineering

IV Year II Semester

S. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	
1	OE	19A18DT	Disaster Management	3	-	-	3
		19A18ET	Building Planning and Construction				
		19A28DT	Battery Energy Storage Systems				
		19A28ET	System Modeling and Simulation				
		19A38ET	Entrepreneurship Development				
		19A38FT	Optimization in Engineering				
		19A38GT	Total Quality Management				
		19A48DT	Introduction to Digital Design				
		19A48ET	Industrial Electronics				
2	PE	19A58AT	Cognitive Science	3	-	-	3
		19A58BT	Data Sciences				
		19A58CT	Software Architecture				
		19A58DT	Wireless Sensor Networks				
Lab Courses							
3	PW	19A581P	Project Phase II				8
				6	0	0	14

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Advanced Java Programming
 Category : PC
 Course Code : 19A551T
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand GUI Programming using JavaFX.
- Understand and Apply the JavaFX controls in GUI applications.
- Understand JDBC API.
- Understand server side programming using SERVLETS and JSP

Unit 1 : Introducing JavaFX GUI Programming: 9
 JavaFX Basic Concepts -The JavaFX Packages, the Stage and Scene Classes, Nodes and Scene Graphs, Layouts, the Application Class and the Lifecycle Methods, Launching a JavaFX Application, A JavaFX Application Skeleton, Compiling and Running a JavaFX Program, The Application Thread.A Simple JavaFX Control: Label, Using Buttons and Events - Event Basics, Introducing the Button Control, Demonstrating Event Handling and the Button, Drawing Directly on a Canvas.

Unit 2 : Exploring JavaFX Controls: 9
 Exploring JavaFX Controls: Using Image and Image View, Toggle Button, Radio Button, CheckBox, ListView, ComboBox, TextField, ScrollPane, TreeView. Introducing Effects and Transforms, Adding Tooltips, Disabling a Control.
 JavaFX Menus: Menu Basics, An Overview of MenuBar, Menu, and MenuItem. Create a Main Menu, Add Mnemonics and Accelerators to Menu Items, Add Images to Menu Items, Use MenuItem and CheckMenuItem, Create a Context Menu, Create a Toolbar, MenuDemo Program.

Unit 3 : JDBC API 9
 JDBC API: Introduction to JDBC API. System Requirements. Types of JDBC Drivers. Creating a Database Table-Oracle Database. Connecting to a Database. Setting the Auto-Commit Mode. Committing and Rolling Back Transactions Transaction Isolation Level, JDBC-Types-to-Java-Types Mapping. Knowing About the Database. Executing SQL Statements. Processing Result Sets. Making Changes to a ResultSet. Handling Multiple Results from a Statement.

Unit 4 : Introducing Servlets 9
 Introducing Servlets: Background, The Life Cycle of a Servlet. Servlet Development Options. Using Tomcat A Simple Servlet. Create and Compile the Servlet Source Code. Start Tomcat. Start a Web Browser and Request the Servlet. The Servlet API: The javax.servlet Package. Reading Servlet Parameters. The javax.servlet.httpPackage.
 Handling HTTP Requests and Responses. Handling HTTP GET Requests. Handling HTTP POST Requests. Using Cookies .Session Tracking. Accessing Databases with JDBC using servlets.

Unit 5 : JSP Basics 9
 JSP Basics: What's Wrong with Servlets? Running Your First JSP, How JSP Works, The JSP Servlet Generated Code, The JSP API, The Generated Servlet Revisited, Implicit Objects,JSP Syntax, Directives, Scripting Elements, Standard Action Elements, Comments Converting into XML Syntax. Developing JSP

Beans: Calling Your Bean from a JSP Page, A Brief Theory of JavaBeans, Making a Bean Available, Accessing Properties Using `jsp:getProperty` and `jsp:setProperty`, Setting a Property Value from a Request, JavaBeans Code Initialization.

Prescribed Text Books:

1. JAVA The Complete Reference 9th edition, Herbert Schildt Oracle Press(Unit-1,2,4).
2. Beginning java8 Apis extensions and libraries, Kishori Sharan, Apress (Unit-3)
3. Java for the Web with Servlets, JSP, and EJB: A Developer's Guide to J2EE Solutions By Budi Kurniawan.(Unit-5)

Reference Text Books:

1. Java 6 Programming, Black Book, Dreamtech
2. Java Server Programming, Java EE6 (J2EE 1.6), Black Book, Dreamtech
3. Advanced Java Technology, By M.T. Savaliya, Dreamtech

Course Outcomes:

Student will be able to

- | | Blooms Level of Learning |
|-------------------------------------------------------------------|--------------------------|
| 1. Understand JavaFX GUI Programming Concepts. | L1, L3 |
| 2. Apply JavaFX Controls and event handling in GUI applications. | L1, L3 |
| 3. Understand and apply JDBC API to retrieve data from Data Base. | L1, L3 |
| 4. Understand and apply Servlets in server side programming. | L1, L3 |
| 5. Understand and apply JSPs in developing web applications. | L1, L3 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A551T.1	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
19A551T.2	-	2	3	3	-	-	-	-	-	-	-	-	3	-	2
19A551T.3	3	-	3	3	-	-	-	-	-	-	-	-	3	-	2
19A551T.4	3	-	3	3	-	-	-	-	-	-	-	-	3	-	-
19A551T.5	3	-	3	3	-	-	-	-	-	-	-	-	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Computer Networks
 Category : PC
 Course Code : 19A552T
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Expose to the basic principles of the technology of data communications and networking
- Understand the concept of data communication and its components
- Comprehend the use of different types of transmission media and network devices, error detection and correction in transmission of data
- Analyze the routing algorithms and congestion control algorithms.

Unit 1 : *Introduction and Physical Layer* 9
 Introduction: Data Communications, Networks, The Internet, Protocols and Standards, Network Models, Layered Tasks, The OSI Model, TCP/IP Protocol Suite, Addressing.
 Physical Layer and Media: Data and Signals, Analog and Digital.
 Transmission Media: Guided Media, Unguided Media
 (Text Book-1 page No: 1 - 27, 57 - 96, 191 - 212)

Unit 2 : *Data Link Layer* 9
 Data link layer: Error Detection and Correction, Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocol, Multiple Access, Random Access, Controlled Access, Channelization, Wired LANs: Ethernet Wireless LANs: IEEE 802.11, Bluetooth.
 Network Devices: Repeaters, Hubs, Bridges, Switches, Routers, and Gateways.
 (Text Book-1 page No: 267-455)

Unit 3 : *Network Layer* 9
 Network Layer: Logical Addressing, IPv4 Addresses, CIDR, Subnets, Classfull and special addressing, IPv6 Addresses, Transition from IPv4 to IPv6,
 Network Layer: Address Mapping, ICMP, IGMP, ICMPv6, Delivery, Forwarding, Unicast Routing Protocols, Multicast Routing Protocols.
 (Text Book-1 page No: 547-700)

Unit 4 : *Transport Layer* 9
 Transport Layer: Process to Process Delivery: UDP, TCP and SCTP, Data Traffic, Congestion, Congestion Control, Two Examples, Quality of Service, Techniques to improve QoS.
 (Text Book-1 page No: 701-841)

Unit 5 : *Application Layer* 9
 Domain Name System: DNS, The DNS Name Space, Domain Resource Records, Name Servers
 Electronic Mail: Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery
 The World Wide Web: Architectural Overview, Static Web Pages, Dynamic Web Pages and Web Applications, HTTP: The Hypertext Transfer Protocol, The Mobile Web, Web Search.
 (Text Book-2 page No: 661-695)

Prescribed Text books:

1. Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw– Hill, Fifth Edition, 2013.
2. A. S. Tanenbaum, "Computer Networks", Pearson Education, Fifth Edition, 2013

Reference Text Books:

1. James F. Kurose, Keith W. Ross, "Computer Networking: A Top–Down Approach Featuring the Internet", Pearson Education, 2005.
2. Larry L.Peterson, Peter S. Davie, "Computer Networks", Elsevier, Fifth Edition, 2012.
3. William Stallings, "Data and Computer Communication", Eighth Edition, Pearson Education, 2007.

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Visualize the different aspects of networks, protocols and network design models.	L1
2. Examine various Data Link layer design issues and Data Link protocols.	L1
3. Analyze, Compare and select appropriate routing algorithms for a network	L2, L4, L5
4. Examine the various end to end protocols helps in analyzing and interpreting the quality of networks.	L3
5. Identify and analyze the various applications over internet	L1, L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A552T.1	1	2	-	3	-	-	-	-	-	-	-	-	3	-	2
19A552T.2	-	1	-	2	-	-	-	-	-	-	-	-	3	-	1
19A552T.3	-	-	1	2	3	-	-	-	-	-	-	-	3	-	1
19A552T.4	-	1	-	2	-	-	-	-	-	-	-	-	3	-	1
19A552T.5	1	1	-	2	2	-	-	-	-	-	-	-	3	1	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Data Warehousing and Data Mining
 Category : PC
 Course Code : 19A553T
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Learn the types of the data to be mined and apply preprocessing methods on raw data.
- Sketch data warehouses and techniques for mining frequent patterns, associations, and correlations.
- Understand different classification algorithms and estimate the accuracy of algorithms.
- Inculcate knowledge on different clustering algorithms.
- Identify the various types of complex data and its applications.

Unit 1 : 8

INTRODUCTION: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining.

Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

Unit 2 : 12

WARE HOUSING: Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, From Data Warehousing to Data Mining.

MINING ASSOCIATION RULES IN LARGE DATABASES: Basic Concepts and a Road Map, Efficient and Scalable Frequent Item set Mining Methods, Mining Various Kinds of Association Rules, and From Association Mining to Correlation Analysis.

Unit 3 : 11

CLASSIFICATION AND PREDICTION: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Other Classification Methods, Prediction, Classifier Accuracy.

Unit 4 : 12

CLUSTER ANALYSIS INTRODUCTION: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

Unit 5 : 10

MINING COMPLEX TYPES OF DATA AND DATA MINING APPLICATIONS: Mining Spatial Databases, Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web, Data Mining Applications.

Prescribed Text books:

1. Data Mining, Concepts and Techniques - Jiawei Han & Micheline Kamber Harcourt India.

Reference Text Books:

1. Data Mining Introductory and advanced topics, Margaret H Dunham, Pearson Education

Department of Computer Science and Engineering

2. Data Mining Techniques, Arun K Pujari, University Press.
3. Data Warehousing in the Real World, Sam Anahory& Dennis Murray. Pearson Edn Asia.
4. Data Warehousing Fundamentals, PaulrajPonnaiah Wiley Student Edition.
5. The Data Warehouse Life cycle Tool kit, Ralph Kimball Wiley Student Edition.

Course outcomes

Student will be able to

Blooms Level of Learning

- | | |
|--------------------------------------------------------------------------------------------------------------|--------|
| 1. To understand and apply the data preprocessing techniques. | L2, L3 |
| 2. To implement data warehouses and techniques for mining frequent patterns, associations, and correlations. | L3 |
| 3. To solve different classification problems and estimate the accuracy of classification algorithms. | L3 |
| 4. To understand and analyze different clustering techniques. | L2,L4 |
| 5. To create various types of complex data such as spatial, text and multimedia. | L6 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A553T.1	3	3	3		3						3			3	3
19A553T.2	3	3	3	3	3	3			2	3			3	3	
19A553T.3	3	3	3	3	3									2	2
19A553T.4	3	3			3								2		3
19A553T.5	3	3	3	3	2	2						2		2	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Advanced Databases
Category : PE
Course Code : 19A55AT
Year : III B. Tech.
Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able

- To learn basic concepts of Distributed Database System and Relational Database management system concepts.
- To acquire knowledge on Architecture model of Distributed Database System.
- To understand the characterization of query processing and decomposition.
- To inculcate the knowledge of distributed query optimization algorithms and transaction management.
- To know the concepts of distributed DBMS reliability and parallel database systems.

Unit 1 : Introduction: 11
Distributed Data Processing, Distributed Database System, Promises of DDBS, Problem areas. Overview of Relational DBMS: Relational Database Concepts, Normalization, Integrity rules, Relational data languages.

Unit 2 : Distributed DBMS Architecture: 9
Architectural Models for Distributed DBMS, DDBS Architecture. Distributed Database Design: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

Unit 3 : Query Processing and decomposition: 9
Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

Unit 4 : Distributed query Optimization: 9
Query optimization, centralized query, optimization, Distributed query optimization algorithms. Transaction Management: Definition, properties of transaction, types of transactions. Distributed concurrency control: Serializability, concurrency control Mechanisms & Algorithms, Time stamped & Optimistic concurrency control Algorithms, Deadlock Management.

Unit 5 : Distributed DBMS Reliability: 9
Reliability concepts and Measures, fault tolerance in Distributed systems, failures in Distributed DBMS, local & Distributed Reliability Protocols, site failures and Network partitioning. Parallel Database Systems: Database Series, Parallel Architecture, Parallel DBMS Techniques, Parallel exception problems, Parallel Execution for Hierarchical architecture.

Prescribed Text books:

1. M.Tamer OZSU and PatuckValduriez: Principles of Distributed Database Systems, Pearson Edn.Asia, 2001.

Reference Text books:

1. Stefano Ceri and Willipse Pelagatti: Distributed Databases, McGraw Hill.
2. Henry F Korth, A Silberchatz and Sudershan : Database System Concepts, MGH

3. Raghurama Krishnan and JohhanesGehrke: Database Management Systems, MGH

Course Outcomes:

Student will be able

Blooms Level of Learning

- | | |
|------------------------------------------------------------------------------------------------------------|-------|
| 1. To learn and understand the concepts of Distributed and Relational Database management system concepts. | L1,L3 |
| 2. To apply database schema for Distributed Database System. | L3 |
| 3. To describe the query processing objectives and decomposition. | L2 |
| 4. To understand knowledge of distributed query optimization algorithms and transaction management. | L2 |
| 5. To analyze the concepts of distributed reliability and parallel database systems. | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55AT.1	3	3	3	3	3	-	-	-	-	-	-	-	3	-	-
19A55AT.2	-	3	3	3	3	-	-	-	-	-	-	-	3	3	3
19A55AT.3	3	3	3	3	3	-	-	-	-	-	-	-	3	3	3
19A55AT.4	3	3	3	3	3	-	-	-	-	-	-	-	3	3	3
19A55AT.5	-	3	3	3	3	-	-	-	-	-	-	-	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Artificial Neural Networks
 Category : PE
 Course Code : 19A55BT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the basics of ANN and comparison with Human brain.
- Acquire knowledge on Generalization and function approximation of various ANN architectures.
- Understand reinforcement learning using neural networks
- Acquire knowledge of unsupervised learning using neural networks.
- Apply data flow testing for software projects.

Unit 1 : INTRODUCTION: 8
 Characteristics of neural networks, terminology, models of neuron, topology
 Activation and synaptic dynamics- Activation dynamics models, synaptic dynamics models, learning methods, stability and convergence. Pattern recognition problem, basic functional units.

Unit 2 : 10
 Feedforward neural networks- analysis of pattern association networks, classification networks, mapping networks.
 FeedBack neural networks - introduction, analysis of linear auto associative Feed forward networks, analysis of pattern storage networks, stochastic networks and simulated annealing, Boltzmann machine

Unit 3 : Support Vector Machines and Radial Basis Function 8
 Learning from Examples, Statistical Learning Theory, Support Vector Machines, SVM application to Image Classification, Radial Basis Function Regularization theory, Generalized RBF Networks, Learning in RBFNs, RBF application to face recognition..

Unit 4 : Attractor Neural Networks 8
 Associative Learning Attractor Associative Memory, Linear Associative memory, Hopfield Network, application of Hopfield Network, Brain State in a Box neural Network, Simulated Annealing, Boltzmann Machine, Bidirectional Associative Memory.

Unit 5 : Self-organization Feature Map 8
 Maximal Eigenvector Filtering, Extracting Principal Components, Generalized Learning Laws, Vector Quantization, Self-organization Feature Maps, Application of SOM, Growing Neural Gas.

Prescribed Text Books:

1. Introduction to Artificial Neural Systems-J.M. Zurada, Jaico Publications 1994. 2. Artificial Neural Networks-B. Yegnanarayana, PHI, New Delhi 1998.
2. Neural Networks A Classroom Approach–Satish Kumar, McGraw Hill Education (India) Pvt. Ltd, Second Edition.

Reference Text books:

1. Introduction to Artificial Neural Networks by GunjanGoswami 3rd edition

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-----------------------------------------------------------------------------------------------------------------------------|------------|
| 1. Understand the role of neural networks in engineering, artificial intelligence, and cognitive modelling. | L1, L2 |
| 2. Understand the concepts and techniques of neural networks through the study of the most important neural network models. | L2 |
| 3. Evaluate whether neural networks are appropriate to a particular application (face recognition). | L1, L2, L3 |
| 4. Understand the concepts of attractor neural network | L2 |
| 5. Understand the concepts of self-organization feature map and its applications | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56GT.1	-	-	-	-	-	-	-	-	3	-	3	-	-	-	3
19A56GT.2	3	3	3	-	3	-	-	-	3	-	3	3	3	-	3
19A56GT.3	3	-	-	-	3	-	-	-	-	-	-	-	3	-	3
19A56GT.4	3	-	-	-	3	-	-	-	3	-	3	3	3	3	3
19A56GT.5	3	-	3	-	3	-	-	-	-	-	-	-	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course	Cryptography & Network Security
Category	PE
Course Code	19A55CT
Year	III B. Tech.
Semester	I Semester
Branch	CSE

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	-	3

Course Objectives:

- This Course focuses on the fundamentals of cryptography and its application to network security.
- The course also focuses on the practical network security applications that have been implemented and are in use to provide email and web security.
- The learners also acquire knowledge of digital signature, authentication, firewalls, intrusion detection techniques.

Unit 1 Introduction to Computer Security Concepts 8
Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, Fundamental Security Design Principles, Attack Surfaces and Attack Trees, A Model for Network Security Standards

Unit 2 Block Ciphers and the Data Encryption Standard 12
Traditional Block Cipher Structure, The Data Encryption Standard, A DES Example, AES Structure, An AES Example, Multiple Encryption and Triple DES, Electronic Codebook, Cipher Block Chaining Mode, Cipher Feedback Mode
Principles of Public-Key Cryptosystems, The RSA Algorithm, Diffie-Hellman Key Exchange

Unit 3 Cryptographic Data Integrity Algorithms and User Authentication 12
Applications of Cryptographic Hash Functions, Two Simple Hash Functions, Hash Functions Based on Cipher Block Chaining, Secure Hash Algorithm. Message Authentication Requirements, Requirements for Message Authentication Codes, HMAC, Digital Signatures
User Authentication: Kerberos version 4

Unit 4 Network and Internet Security 8
Web Security Considerations, Transport Layer Security, Email Security, S/MIME, Pretty Good Privacy

Unit 5 IP Security and System Security 10
IP Security: IP Security Overview, IP Security Policy, Encapsulating Security Payload.
System Security: Intruders, Intrusion Detection, Password Management, Types of Malicious Software, Viruses, Virus Countermeasures, Worms, Distributed Denial of Service Attacks, Firewalls

Prescribed Text Books

1. Cryptography and Network security: Principles and Practice by William Stallings, Pearson Education, 7th Edition
2. William Stallings, Network Security Essentials (Applications and Standards), Pearson, Fourth Edition.

Department of Computer Science and Engineering

Reference Books

1. Charlie Kaufman, Radis Perlman and Mike Speciner, "Network Security – Private Communication in a Public World" 2nd ed., Pearson Education, 2003
2. J.W. Rittiaghouse and William M.Hancock, Cyber Security Operations Handbook, Elseviers.
3. Behrouz A. Forouzan, Cryptography & Network Security, McGraw Hill

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|---------------------------------------------------------------|--------|
| 1. Understand computer security concepts and security threats | L1, L2 |
| 2. Apply knowledge of encryption algorithms to protect data | L2, L3 |
| 3. Perform data integrity and user authentication | L3, L4 |
| 4. Examine security protocols for web security | L2, L3 |
| 5. Apply knowledge of IP security and system security | L2, L3 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55CT.1	2											2			
19A55CT.2	3		3		3							3	3	3	
19A55CT.3	2		2		3							3	3	3	
19A55CT.4	3		3		3							3	3		3
19A55CT.5	3		3		3							3	3		3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Principles of Programming Languages
 Category : PE
 Course Code : 19A55DT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the types of programming languages, syntax and semantics.
- Demonstrate the principles of data types and expressions.
- Define compound statements and fundamentals of sub programs.
- Analyze data abstraction and Exception Handling in Ada, C++, Java.

Unit 1 : Preliminary Concepts 9

Preliminary Concepts: Reasons for studying concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories.

Syntax and Semantics: General Problem of describing Syntax and Semantics, formal methods of describing syntax, BNF, EBNF for common programming language features, parse trees, ambiguous grammars, attribute grammars, Denotational semantics and axiomatic semantics for common programming language features.

Unit 2 : Data types 9

Data types :Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types, Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Expressions: Arithmetic, relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements.

Unit 3 : Control Structures 9

Control Structures: Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands. Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub- program names, design issues for functions, user defined overloaded operators, co routines.

Unit 4 : Abstract Data types 9

Abstract Data types: Abstractions and Encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

Unit 5 : Logic Programming Language 9

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Department of Computer Science and Engineering

Prescribed Text books:

1. Concepts of Programming Languages Robert W. Sebesta, Pearson Education, Eighth Edition 2008
2. Programming Languages-Louden,second edition, Thomson.

Reference Text Books:

1. Programming Languages-Ghezzi, 3/e, John Wiley.
2. Programming Languages Design and implementation-Pratt and Zelkowitz, Fourth Edition PHI / Pearson Education

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|----------------------------------------------------------------------|--------|
| 1. Select the required programming language for their application. | L1, L3 |
| 2. Develop to summarize the principles of data types and expressions | L1, L3 |
| 3. Understand to make use of control structures and sub programs. | L2 |
| 4. Construct Abstract data types and Exception Handling. | L6 |
| 5. Compare different types of programming languages | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55DT.1	3	3	3	3	-	-	-	-	-	-	-	-	3	-	-
19A55DT.2	3	3	3	3	-	-	-	-	-	-	-	-	3	-	3
19A55DT.3	3	3	3	3	-	-	-	-	-	-	-	-	3	-	3
19A55DT.4	3	3	3	3	-	-	-	-	-	-	-	-	3	-	3
19A55DT.5	3	3	3	3	-	-	-	-	-	-	-	-	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Distributed Systems
 Category : PE
 Course Code : 19A55ET
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Learn the characteristics of distributed systems and system models.
- Acquire the depth knowledge on distributed objects and remote invocations.
- Apply various domain naming services.
- Compare the different issues of Global clocks, process states coordination and agreement.
- Analyze the optimistic concurrency control and distributed transactions.

Unit 1 : CHARACTERIZATION OF DISTRIBUTED SYSTEMS: 9
 Introduction, Examples of Distributed systems, Resource sharing and web, challenges, System models: Introduction, Architectural and Fundamental models, networking and Inter-networking, Inter-process Communication.

Unit 2 : DISTRIBUTED OBJECTS AND REMOTE INVOCATION: 9
 Introduction, Communication between distributed objects, RPC, Events and notifications, Case study- Java RMI.
 OPERATING SYSTEM SUPPORT: Introduction, OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture. Distributed File Systems-Introduction, File Service architecture.

Unit 3 : NAME SERVICES: 9
 Introduction, Name Services and the Domain Name System, Case study of the Global Name Service. Peer to Peer Systems: Introduction, Napster and its legacy, Peer to Peer middleware, routing overlays.

Unit 4 : TIME AND GLOBAL STATES 9
 Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global states, distributed debugging.
 COORDINATION AND AGREEMENT: Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

Unit 5 : TRANSACTIONS AND CONCURRENCY CONTROL: 9
 Introduction, Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering.
 DISTRIBUTED TRANSACTIONS: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery, Replication-Introduction, Fault tolerant services, Transactions with replicated data.

Prescribed Text Books:

1. G Coulouris, J Dollimore and T Kindberg, *Distributed Systems Concepts and Design*, Pearson Education, 4thEd.

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Understand the characteristics of distributed systems and system models.	L1
2. Describe knowledge on distributed objects and remote invocations	L3
3. Use various domain naming services.	L4
4. Distinguish different issues of Global clocks, process states coordination and agreement.	L5
5. Estimate the optimistic concurrency control and distributed transactions.	L5

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55ET.1	-	-	3	-	-	3	3	-	-	-	-	3	3	3	-
19A55ET.2	-	2	-	-	-	3	3	-	-	-	3	3	3	-	3
19A55ET.3	-	2	3	2	-	3	-	-	-	-	3	3	3	3	-
19A55ET.4	-	-	3	-	-	-	-	-	-	-	3	-	-	3	3
19A55ET.5	-	-	3	2	-	-	-	-	-	-	-	3	3	3	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Computer Graphics
 Category : PE
 Course Code : 19A55FT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the applications in the real world and the graphics systems used in developing graphics.
- Design basic primitives (both 2D and 3D) using algorithms.
- Apply transformations on the objects.
- Apply clipping methods and viewing transformations

Unit 1: *Introduction:* 8

Applications: Usage of Graphics and their applications, Presentation Graphics- Computer Aided Design- Computer Art- Entertainment- Education and Training- Visualization- Image Processing- Graphical User Interfaces.

Overview of Graphics Systems: Video Display Devices - Raster Scan systems - Random Scan Systems - Graphics Monitors and Workstations - Input devices - Hard Copy Devices- Graphics Software.

Unit 2: 12

Output Primitives & its Attributes:

Points and Lines-Line Drawing Algorithms- Loading the Frame buffer- Line function- Circle-Generating Algorithms- Ellipse Generating Algorithms- Filled Area Primitives-Filled Area Functions- Cell Array- Character Generation.

Attributes of Output Primitives:

Line and Curve Attributes-Color and Gray scale levels- Area Fill Attributes- Character Attributes-Bundled Attributes- Inquiry Functions- Anti aliasing.

Unit 3: 12

Two Dimensional Geometric Transformations:

Basic Transformations – Matrix Representations - Homogeneous Coordinates - Composite Transformations - Other Transformations, Transformations between Coordinate Systems, Affine Transformations, and Transformation Functions.

Two-Dimensional Viewing:

The viewing Pipeline-Viewing Coordinate Reference Frame-Window-to-Viewport Coordinate Transformation- Two-Dimensional Viewing Functions-Clipping Operations-Point Clipping-Line Clipping-Polygon Clipping- Curve Clipping- Text and Exterior Clipping.

Structure And Hierarchical Modeling: Concepts of Structures and Basic models- Editing

Unit 4: 8

Three Dimensional Concepts and Object representations & Transformation:

3D display methods - 3D Graphics - Polygon Surfaces - Curved Lines and Surfaces - Quadratic Surfaces-Super Quadrics - Blobby Objects - Spline Representations - Cubic Spline methods -Bezier Curves and Surfaces – B-Spline Curves and Surfaces.

Three Dimensional Geometric and Modeling Transformations:

Translation – Rotation - scaling - Other Transformations - Composite Transformations – 3D Transformation Functions.

Unit 5: 8

Three-Dimensional Viewing:

Viewing Pipeline- Viewing Coordinates- Projections- View Volumes- General Projection Transformations- Clipping-Hardware Implementations- Three-Dimensional Viewing.

Visible Surface Detection Methods:

Classification of visible-surface detection algorithms, Back face method, Depth buffer method, Scan line method.

Prescribed Text Books:

1. Donald Hearn & M. Pauline Baker, "Computer Graphics C Version", 2004, Pearson Education, New Delhi,
2. Zhigang Xiang, Roy A Plastock, "Schaum's Outlines- Computer Graphics " adapted by P S Avadhani, 2nd Edition, McGraw Hill.

Reference Text books:

1. David F. Rogers," Procedural Elements for Computer Graphics", 2003, Tata McGraw Hill New Delhi.
2. J.D.Foley, S.K Feiner ,A Van Dam. F. H. John "Computer Graphics-Principles & Practice in C", 2004, Pearson Education.

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Define computer graphics, applications and contemporary terminology, hardware components etc.	L1
2. Implement 2D and 3D objects using algorithms and apply attributes of primitives and anti – aliasing	L3
3. Apply geometric transformations on 2D and 3D objects.	L3
4. Apply viewing transformations on 2D and 3D objects.	L3
5. Explain visible surface methods.	L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55FT.1	3	-	-	-	-	-	-	-	-	-	-	-	3	3	3
19A55FT.2	3	3	3	-	3	-	-	-	-	-	-	3	3	3	3
19A55FT.3	3	3	3	-	3	-	-	-	-	-	-	3	3	3	3
19A55FT.4	3	3	3	-	3	-	-	-	-	-	-	3	3	3	3
19A55FT.5	3	3	3	-	3	-	-	-	-	-	-	3	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Linux Programming
 Category : PE
 Course Code : 19A55GT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand and make effective use of Linux utilities and shell scripting language to solve problems.
- Learn the implementation in C some standard Linux utilities like mv, cp, ls etc...
- Develop the skills the necessary for systems programming including file system programming, process and signal management.
- Develop the skills inter-process communication, message queues and semaphores.
- Develop the basic skills required to write network programs using sockets and shared memory.

Unit 1 : INTRODUCTION TO LINUX UTILITIES AND SHELL PROGRAMMING 9

Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text Processing utilities and backup utilities. sed- scripts, operation, address, commands, applications, awk- execution, fields and records, scripts, operations, patterns, actions, associative arrays, string and mathematical functions, system commands in awk, applications.

Unit 2 : FILES AND DIRECTORIES 9

Files: File Concept, File types ,File system Structure, File meta data – Inodes, Kernel support for files, System calls for I/O operations – open, create, read, write, lseek, dup2. File status information – stat family, file and record locking, fcntl function, Links – Soft links & hard links – symlink, link, unlink.
 Directories: creating, removing, changing directories – mkdir, rmdir, chdir, obtaining current working directory – getcwd, directory contents, scanning directories – opendir, readdir, closedir, rewinddir functions

Unit 3 : PROCESS AND SIGNALS 9

Process: Process concepts, layout of C program image in main memory, process environment – environment list, environment variables, getenv, setenv, Kernel support for process, process identification, process control- process creation. Replacing a process image, Waiting for a process, process termination, zombie process, orphan process, system call interface form process management – fork, vfork, exit, wait, waitpid, exec family, process groups, session and controlling terminal, difference between threads and processes.Signal- Introduction to signals, Signal generation and handling, Kernel support for signal, Signal function, unreliable signals, reliable signals, Kill, raise, alarm, pause, abort, sleep functions.

Unit 4 : INTER PROCESS COMMUNICATIONS, MESSAGE QUEUES AND SEMAPHORES 9

Inter Process Communications:- Introduction to IPC, IPC between processes on a single computer, IPC between processes on different systems, pipes – creating, IPC between related processes using Unnamed Pipes, FIFOs – creation, IPC between unrelated processes using FIFO (named pipes), difference between named and unnamed pipes, popen and pclose library functions.

Message Queues – kernel support for messages, APIs for Message Queues, client/server examples.

Semaphores – Kernel support for semaphores, APIs for semaphores, FILE locking with semaphores.

Unit 5 : SHARED MEMORY AND SOCKETS

9

Shared Memory: -Kernel support for Shared memory, APIs for shared memory, shared memory examples.

Sockets:- Introduction to Berkeley Sockets, IPC over a network, client/server model, Sockets Address Structure(UNIX Domain & Internet Domain), Socket System calls for connection oriented Protocol and connectionless protocol, Example client/server programs – single server-client connection, multiple simultaneous clients, socket options – setsockopt and fcntl system calls, comparison of IPC mechanisms.

Prescribed Text Books:

1. Unix System Programming using C++, T. Chan, PHI.
2. Unix concepts and Applications, 4th Edition, Sumitabha Das, TMH.
3. Linux System Programming. Robert Love, O'Reilly, SPD.
4. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Willey India Edition.

Reference Text books:

1. Unix Network Programming, W.R.Stevens,PHI.
2. Unix and Shell Programming, B.A. Forouzan& R.F. Gilberg, Cengage Learning

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-----------------------------------------------------------------------------------------|----|
| 1. Understand the basic commands of Linux operating system and can write shell scripts | L2 |
| 2. Create file systems and directories and operate them | L6 |
| 3. Apply processes background and fore ground etc.. by fork() system calls | L3 |
| 4. Understand message queues and can exercise inter-process communication | L2 |
| 5. Analyze shared memory segments, pipes and network socket programming implementation. | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55GT 1	3	3	3	3	-	-	-	-	-	-	3	3	3	3	3
19A55GT.2	3	3	3	3	-	-	-	-	-	-	3	3	3	3	3
19A55GT 3	3	3	3	3	-	-	-	-	-	-	3	3	3	3	3
19A55GT 4	3	3	3	3	-	-	-	-	-	-	3	3	3	3	3
19A55GT 5	3	3	3	3	-	-	-	-	-	-	3	3	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Software Project Management
 Category : PE
 Course Code : 19A55HT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the basics of the project management and requirements management throughout the product development cycle.
- Know the distinction between conventional and modern approaches for developing a software project.
- Learn about the life cycle phases and artifacts in software development process.
- Understand the importance of Work breakdown structures and responsibilities while working in a real time projects.
- know how to measure the software quality and risk management in a modern project profiles

Unit 1 : 9

Conventional Software Management: The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation. Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

Unit 2 : 9

The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, pragmatic artifacts.

Unit 3 : 9

Model based software architectures: A Management perspective and technical perspective.

Work Flows of the process: Software process workflows, Iteration workflows.

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

Unit 4 : 9

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

Unit 5 : 9

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process: Process discriminants.

Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.

Prescribed Text books:

1. Software Project Management, Walker Royce: Pearson Education, 2005.

Reference Text Books:

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Understand the conventional software Management and Software Economics factors that affect the development of a software project.	L2
2. Recognize Artifacts of the software process and can also use artifacts in Software Development lifecycle.	L2, L3
3. Analyze the workflows and can create check points of process in a project management	L4
4. Organize the work breakdown structures and assign the roles & responsibilities in a project organization for establishing an active network.	L4
5. Apply project metrics in managing software project	L3

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55HT.1	2	-	-	2	-	-	-	-	-	-	3	-	3	3	3
19A55HT.2	-	3	3	-	3	3	-	-	3	3	3	-	3	3	3
19A55HT.3	-	3	3	-	3	-	-	-	-	-	3	-	3	3	3
19A55HT.4	-	3	-	-	3	3	-	1	3	3	3	-	3	3	3
19A55HT.5	2	-	3	2	3	-	-	-	-	-	3	1	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Cloud Computing
 Category : OE
 Course Code : 19A55IT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Learn the new computing model this enables shared resources on demand over the Network.
- Understand about the pay-per-use scenarios.
- Apply the new kind of service models and deployment models.
- Analyze the virtualization technology and to improve cloud Storage systems.
- Develop Cloud security and cloud application model.

Unit 1 : 9

Introduction: Network centric computing and network centric content, Peer-to-peer systems, VCloud Computing: an old idea whose time has come, Cloud Computing delivery models & Services, Ethical issues, Cloud vulnerabilities, Challenges

Cloud Infrastructure: Amazon, Google, Azure & online services, open source private clouds. Storage diversity and vendor lock-in, intercloud, Energy use & ecological impact of data centers, service level and compliance level agreement, Responsibility sharing, user experience, Software licensing.

Unit 2 : 9

Cloud Computing: Applications & Paradigms, Challenges, existing and new application opportunities, Architectural styles of cloud applications, Workflows coordination of multiple activities, Coordination based on a state machine model -the Zoo Keeper, The Map Reduce programming model, Apache Hadoop,

Applications: Healthcare, Energy systems, transportation, manufacturing, Education, Government, mobile communication, application development.

Unit 3 : 9

Cloud Resource Virtualization: Definition, merits and demerits, types & Techniques, Layering, Virtual machine monitors, Hardware support for virtualization Case study: Xen -aVMM based on paravirtualization, Optimization of network virtualization in Xen 2.0, vBlades-paravirtualization targeting a x86-64 Itanium processor, A performance comparison of virtual machines, The darker side of virtualization, Software fault isolation.

Unit 4 : 9

Cloud Resource Management: Policies and mechanisms for resource management, Stability of a two level resource allocation architecture, Feedback control based on dynamic thresholds, Coordination of specialized autonomic performance managers,

Storage systems :Evolution, Storage models, file systems, databases, General parallel File system, GFS, Hadoop, Locks & Chubby, TPS, NOSQL, BigTable.

Unit 5 : 9

Cloud security: Risks, Security, privacy, Trust. Security of OS, VM, VMM, shared image, management OS. Cloud Application Development: Amazon Web services, EC2 Instances, connecting clouds,

Security rules, Launch and EC2 Linux instances.

Prescribed Text books:

1. Cloud Computing Theory and Practice – DAN C. Marinescu – ELSEVIER
2. Cloud Computing : A hands on Approach BaghaMadiseti

Reference Text Books:

1. Distributed and Cloud Computing, From Parallel Processing to the Internet of Things, Kai Hwang, Jack Dongarra, Geoffrey Fox. MK Publishers.
2. Cloud Computing: A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, McGraw Hill, 2010

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|--------------------------------------------------------------------------------|----|
| 1. Understand cloud computing and shared resources over the internet. | L1 |
| 2. Illustrate different cloud applications in cloud platforms. | L2 |
| 3. Make use of virtual machines and optimization of virtualization. | L3 |
| 4. Analyze cloud resources and to choose storage system for computing clouds. | L2 |
| 5. Examine Cloud security, and risks involved in developing cloud application. | L3 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19B55IT.1	3	3	3	--	3	-	-	-	3	3	3	3	3	-	3
19B55IT.2	3		3	-	-	-	3	-	-	-	3	-	3	-	3
19B55IT.3	3	3	3	-	3	3	3	-	3	-	-	3	3	-	3
19B55IT.4	3	-	-	-	3	-	3	-	3	3	3	-	3	-	3
19B55IT.5	3	3	3	-	-	3	-	-	2	-	-	3	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Cyber Security
 Category : OE
 Course Code : 19A55JT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Remember Cyber Security architecture principles
- Compare different classes of attacks
- Understand about cybercrime with mobile and wireless devices
- Apply tools and methods used in cybercrime
- Understand about cyber security and social media marketing.

Unit 1 : INTRODUCTION: 11

Cybercrime:

Definition and Origins of the Word, Cybercrime and Information Security, Who are Cybercriminals?, Classifications of Cybercrimes, The Legal Perspectives, Indian Perspectives, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes, Cybercrime Era: Survival Mantra for the Netizens

Cyber offenses:

Introduction of Criminal Planning and Criminal Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector Cloud Computing.

Unit 2 : CYBERCRIME MOBILE AND WIRELESS DEVICES: 9

Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones.

Unit 3 : TOOLS AND METHODS USED IN CYBERCRIME: 9

Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks, Phishing and Identity Theft: Introduction, Phishing, Identity Theft(ID Theft)

Unit 4 : CYBERCRIMES AND CYBER SECURITY: 10

Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario in India, Consequences of Not Addressing the Weakness in Information Technology Act, Digital Signatures and the Indian IT Act, Information Security Planning and Governance, Information Security Policy Standards, Practices, The information Security Blueprint, Security education, Training and awareness program, Continuing Strategies.

Unit 5 : UNDERSTANDING COMPUTER FORENSICS: 9

Introduction, Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber forensics and Digital Evidence, Forensics Analysis of E-Mail, Digital Forensics Life Cycle, Chain of Custody Concept, Network Forensics, Approaching a Computer Forensics Investigation, Computer Forensics and Steganography, Relevance of the OSI 7 Layer Model to Computer Forensics.

Prescribed Text Books:

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole, SunitBelapure, Wiley.
2. Principles of Information Security, MichealE.Whitman and Herbert J.Mattord, Cengage Learning.

Reference Text Books:

1. Information Security, Mark Rhodes, Ousley, MGH.
2. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press

Web References:

1. https://www.tutorialspoint.com/fundamentals_of_science_and_technology/cyber_crime_and_cyber_security.htm

Course Outcomes

Student will be able to	Blooms Level of Learning
1. Remember Cyber Security architecture principles	L1
2. Compare different classes of attacks	L2
3. Understand about cybercrime with mobile and wireless devices	L2
4. Apply tools and methods used in cybercrime	L3
5. Understand about cyber security and social media marketing	L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55JT.1	3	-	3	-	3	-	-	3	-	-	3	-	3	-	-
19A55JT.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
19A55JT.3	3	-	-	-	-	-	-	3	-	-	-	-	3	-	3
19A55JT.4	3	3	3	-	3	-	-	-	-	-	3	-	-	3	-
19A55JT.5	-	-	3	-	3	-	-	-	-	-	3	-	-	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Human Computer Interaction
 Category : OE
 Course Code : 19A55KT
 Year : III B .Tech
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the procedures, principles and significance of graphical user interfaces.
- Design, implement and evaluate graphical user interfaces.
- Learn patterns and modes of human computer interaction.
- Know how to use tools for human centred information system development.
- Learn the working of various components in the field of human computer interaction.

Unit 1 : INTRODUCTION: 9

Introduction

Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

Unit 2 : DESIGN PROCESS & SCREEN DESIGNING 13

Design process – Human interaction with computers, importance of human characteristics, human considerations in design, Human interaction speeds, and understanding business junctions.

Screen Designing : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition– information retrieval on web – statistical graphics – Technological consideration in interface design.

Unit 3 : WINDOWS & COMPONENTS 10

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors

Unit 4 : TOOLS & METHODS 8

Software tools – Specification methods, interface – Building Tools.

Unit 5 : INTERACTION DEVICES 9

Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Prescribed Text Books:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamaTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia

Department of Computer Science and Engineering

Reference Text books:

1. Human – Computer Interaction. Alan Dix, Janet Finckay, Gregory Abowd, Russell Beaulieu, Pearson Education.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech
3. User Interface Design, Soren Lauesen, Pearson Education.
4. Human- Computer Interaction, D. R. Olsen, Cengage Learning.
5. Human- Computer Interaction, Smith – Atakan, Cengage Learning

Course Outcomes:

After completing of the course, the student will be able to:

Blooms Level of Learning

- | | |
|------------------------------------------------------------------------------|-------|
| 1. Describe key design principles of human computer interfaces. | L1 |
| 2. Apply and compare selected design methods at a basic level of competence. | L3,L4 |
| 3. Discuss HCI issues in different environments. | L2 |
| 4. Define good user interfaces. | L1 |
| 5. understand the working of interaction devices | L1,L3 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55KT.1	3	3	-	-	-	-	-	-	-	-	-	3	3	-	3
19A55KT.2	3	3	3	1		3	-	-	-	-	-	3	3	-	3
19A55KT.3	3	3	3	-	2	-	-	-	-	-	-	3	3	2	3
19A55KT.4	3	2	-	-	2	3	-	-	-	-	-	3	3	2	3
19A55KT.5	3	2	-	-	-	3	-	-	-	-	-	3	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : R Programming
 Category : OE
 Course Code : 19A55LT
 Year : III B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the basics in R programming in terms of constructs, control statements, string functions
- Understand the use of R for Big Data analytics
- Learn to apply R programming for Text processing
- Able to appreciate and apply the R programming from a statistical perspective

Unit 1 : Introduction 9
 Introducing to R – R Data Structures – Help functions in R – Vectors – Scalars – Declarations – recycling – Common Vector operations – Using all and any – Vectorized operations – NA and NULL values – Filtering – Vectorised if-then else – Vector Equality – Vector Element names

Unit 2 : Matrices, Arrays And Lists 9
 Creating matrices – Matrix operations – Applying Functions to Matrix Rows and Columns – Adding and deleting rows and columns – Vector/Matrix Distinction – Avoiding Dimension Reduction – Higher Dimensional arrays – lists – Creating lists – General list operations – Accessing list components and values – applying functions to lists – recursive lists

Unit 3 : Data Frames 10
 Creating Data Frames – Matrix-like operations in frames – Merging Data Frames – Applying functions to Data frames – Factors and Tables – factors and levels – Common functions used with factors – Working with tables - Other factors and table related functions - Control statements – Arithmetic and Boolean operators and values – Default values for arguments - Returning Boolean values – functions are objects – Environment and Scope issues – Writing Upstairs - Recursion – Replacement functions – Tools for composing function code – Math and Simulations in R

Unit 4 : OOP 9
 S3 Classes – S4 Classes – Managing your objects – Input/Output – accessing keyboard and monitor – reading and writing files – accessing the internet – String Manipulation - Overview of String Manipulation function -Regular Expressions - Use of String Utilities in the edtdbg Debugging Tool

Unit 5 : Graphics & Interfacing 9
 Graphics – Creating Graphs – Customizing Graphs – Saving graphs to files – Creating three-dimensional plots - Interfacing R to other languages –Writing C/C++ Functions to Be Called from R - Using R from Python.

Prescribed Text Books:

1. Norman Matloff , “The Art of R Programming: A Tour of Statistical Software Design”, No Starch Press, 2011

Reference Text books:

1. Mark Gardener, "Beginning R – The Statistical Programming Language", Wiley, 2013
2. Robert Knell, "Introductory R: A Beginner's Guide to Data Visualisation, Statistical Analysis and Programming in R", Amazon Digital South Asia Services Inc, 2013.

Course Outcomes:

Student will be able to

1. Understand and apply the basics in R programming in terms of constructs, control statements, string functions
2. Apply the functions on matrix rows and columns and list operations
3. Work on Data frames and tabular type of DATA
4. Understand and write reliable code using OOP concepts in R
5. Understand and apply R Interfaces for Other languages

Blooms Level of Learning

L1, L3

L3

L3

L1, L3

L1,L3

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A55LT.1	3	3	3	3	3	-	-	-	-	-	-	3	3	3	-
19A55LT.2	-	3	3	3	3	-	-	-	-	-	-	3	3	3	3
19A55LT.3	3	3	3	3	3	-	-	-	-	-	-	3	3	3	3
19A55LT.4	3	3	3	3	3	-	-	-	-	-	-	-	3	3	-
19A55LT.5	3	3	3	-	3	-	-	-	-	-	-	3	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course	General Aptitude
Category	HS
Course Code	19AC51L
Year	III B. Tech
Semester	I Semester
Branch	CE, ME & CSE

Lecture Hours	Tutorial Hours	Practical	Credits
0	0	2	1

Course Objectives:

- To equip students with aptitude and reasoning skills in order to help them succeed in competitive exams.
- To help students improve their knowledge of quantitative and reasoning skills, which in turn helps them comprehend and solve various mathematical problems in professional life.
- To equip students with English verbal and reasoning skills in order to help them succeed in exams like GRE, TOEFL and help them to do well in placement drives.
- To help students improve their knowledge of grammar, vocabulary and reasoning skills pertain to English.

Quantitative Aptitude:

Number Systems - HCF and LCM - Averages - Problems on ages- Percentages - Profit and loss - Simplification - Ratio and Proportion - Time and Work - Time and Distance - Simple interest and Compound interest -Calendar - Clocks - Mensuration: Area, Volume and Surface Areas - Data Interpretation: Tabulation, Line Graphs, Bar Graphs, Pie charts.

Reasoning:

Directions - Blood Relations - Series and Sequences - Odd man out - Coding and Decoding - Data Sufficiency-Logical deductions.

English for Competitive Examinations

Synonyms - Antonyms - Analogy - Words often confused, One-word substitutions - Idioms and Phrases - Homonyms - Spellings

Reading comprehension - Cloze tests

Articles - Prepositions - Tenses - Voice - Error spotting and correcting - Sentence improvement.

Rearrangement of jumbled words and jumbled sentences - word pairs - sentence completion

Prescribed Textbooks:

1. R.S. Agarwal, Quantitative Aptitude, S. Chand Publishers, New Delhi, 2005.
2. R. S. Agarwal, Verbal and Non-Verbal Reasoning, S. Chand Publishers, New Delhi, 1998.
3. Hari Prasad, "Objective English for Competitive Exams", TMH
4. R. S. Agarwal, "Objective English", S. Chand Publishers

Reference Books

1. ShakuntalaDevi, Puzzles to Puzzle you, Orient Paper Backs Publishers (OPB), New Delhi, 2005.
2. Arun Sharma, How to Prepare for Quantitative Aptitude, TMH Publishers, New Delhi, 2003.
3. Sharon Weiner-Green, IrnK.Wolf, Barron's GRE, Galgotia Publications, New Delhi, 2006.
4. Shakuntala Devi, More Puzzles, OPB, New Delhi, 2006.
5. Ravi Narula, Brain Teasers, Jaico Publishing House, New Delhi, 2005.

6. George J Summers, Puzzles and Teasers, Jaico Publishing House, Mumbai, 2005

Course Outcomes:

Student will be able to

1. demonstrate various principles involved in solving mathematical problems pertain to Quantitative functions.
2. decode information from charts and interpret their logical thinking in the aspects.
3. interrelate English vocabulary with the knowledge of synonyms, antonyms, idiomatic expressions and, accuracy in English spelling
4. apply knowledge of articles, prepositions, tenses and voice to correct errors or to improve sentences

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
19AC51L.1	3											3
19AC51L.2	3											3
19AC51L.3										3		3
19AC51L.4										3		3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Advanced JAVA Programming Lab
Category : PC
Course Code : 19A551L
Year : III B. Tech.
Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
0	0	2	1

Course Objectives: This course will able to

- Understand and Apply the JavaFX controls in GUI applications.
- Understand and retrieve data from data base using JDBC API.
- Understand server side programming using SERVLETS and JSP

Week1 :

1. Create Simple JavaFX application skeleton.
2. Demonstrate a JavaFX label.
3. Demonstrate JavaFX events and buttons
4. Demonstrate drawing on canvas

Week2 :

1. Load and display an image. Demonstrate an image in a label. Use an image with a button.
2. Demonstrate a toggle button.
3. A simple demonstration of Radio Buttons and event handling.
4. Radio button example demonstrates how the currently selected button in a group can be obtained under program control, when it is needed, rather than responding to action or change events.

Week3:

1. Demonstrate Check Boxes.
2. Demonstrate a list view, adding scrollbars, enabling multiple selections in the list.
3. Demonstrate a combo box.

Week4:

1. Demonstrate a scroll pane
2. Demonstrate a Tree View
3. Demonstrate rotation, scaling, glowing, and inner shadow on JavaFX controls
4. Demonstrate different types of Menus

Week5:

Java Program to get connection with Oracle Database, execute SQL Statements and handling the Result set.

Week6:

1. Simple servlet program
2. Program to read servlet Parameters
3. Program to handle HTTP Get and POST Request using servlets

Week7:

1. Program for using Cookies in servlets.
2. Program for session tracking in servlets.
3. Program to access and perform operations on Database using servlets.

Week8:

1. Simple JSP Program
2. Program to call a Java Bean in JSP
3. Program to access properties Using jsp:getProperty and jsp:setProperty.

4. Simple JSP page with custom tags.

Text Books:

1. JAVA The Complete Reference 9th edition , Herbert Schildt Oracle Press(week-1,2,3,4 and 6, 7)
2. Beginning java8 Apis extensions and libraries, Kishori Sharan, Apress(week-5)
3. Java for the Web with Servlets, JSP, and EJB: A Developer's Guide to J2EE Solutions By Budi Kurniawan.(week-8)

Reference Text Books:

1. Java 6 Programming, Black Book, Dreamtech
2. Java Server Programming, Java EE6 (J2EE 1.6), Black Book, Dreamtech
3. Advanced Java Technology, By M.T. Savaliya, Dreamtech

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|------------------------------------------------------------------|--------|
| 1. Apply JavaFX GUI Programming Concepts. | L1, L3 |
| 2. Apply JavaFX Controls and event handling in GUI applications. | L1, L3 |
| 3. Apply JDBC API to retrieve data from Data Base. | L1, L3 |
| 4. Apply Servlets in server side programming. | L1, L3 |
| 5. Apply JSPs in developing web applications. | L1, L3 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A551L.1	1	-	3	-	3	2	-	-	-	-	-	-	3	-	-
19A551L.2	1	-	3	-	3	3	-	-	3	-	3	-	3	-	-
19A551L.3	1	-	3	-	3	3	-	-	3	-	3	-	3	-	3
19A551L.4	1	-	3	-	3	3	-	-	3	-	-	-	3	3	3
19A551L.5	1	-	3	-	3	3	-	-	-	-	-	-	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Data Mining and Computer Networks Lab
Category : PC
Course Code : 19A554L
Year : III B. Tech.
Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
0	0	2	1

Course Objectives: This course will able to

- Organize different datasets with preprocessing techniques and perform association rule mining.
- Find the accuracy of different classifier models and classify different applicants.
- Analyze the cross-validation technique and construct a decision tree.
- Be familiar with network simulation tools.
- Have hands on experience on various networking protocols.

Data Mining Lab

CREDIT RISK ASSESSMENT

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data: Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany.

Credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment.

(Unless you really can consult a real loan officer!)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- Owns telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- Foreign worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into

one of two categories, good or bad.

Week1 :

1. Demonstration of preprocessing on dataset creditg.arff.

Week2 :

2. Demonstration of Association Rule process using Apriori algorithm.

Week3:

3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training and demonstrate the classification rule process using j48 algorithm.

Week4:

4. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full ceding dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.

Week5:

5. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the CREDIT_G ARFF data file to get all the attributes initially before you start selecting the ones you want.)

Week6:

6. Describe what cross-validation is briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why?

Computer Networks Lab

Week -1:

1. Simulate network topologies Star, Bus, Mesh and Ring using Packet Tracer Tool.
2. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.

Week - 2:

3. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.
4. Implement Dijkstra's algorithm to compute the Shortest path through a graph.

Week -3:

5. Implement and simulate algorithm for Distance vector routing protocol.
6. Implement and simulate algorithm for Link state routing protocol.

Week - 4:

7. Install network simulator NS-2 in any of the Linux operating system and simulate wired and wireless scenarios

Week- 5

8. Using Wireshark observe data transferred in client server communication using UDP and identify the UDP datagram
9. Using Wireshark observe Three Way Handshaking Connection Establishment, Data Transfer and Three-Way Handshaking Connection Termination in client server communication using TCP.

Week - 6:

10. Design and configure a network with multiple subnets with wired and wireless LANs using required network devices. Configure the following services in the network- TELNET, SSH, FTP server, Web server, File server, DHCP server and DNS server.

11. Implement Simple Mail Transfer Protocol.

Task Resources:

1. Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)
 - o Decision Trees (Source: Tan, MSU)
 - o Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
 - Weka resources: Introduction to Weka (html version) (download ppt version)
 - Download Weka
 - Weka Tutorial
2. Computer Networks A Systems Approach-Larry L.Peterson and Bruce S.Davie,4th Edition Morgan Kaufman

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Organize different datasets with preprocessing techniques and apply association rule mining.	L2, L3
2. Find the accuracy of different classifier models and classify different applicants.	L2
3. Analyze the cross-validation technique and construct a decision tree.	L4,L6
4. Design simple data transmission using networking concepts and implement.	L6
5. Compare and analyze different existing protocols	L4

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A554L.1	3	3	3		3						2			3	3
19A554L.2	3	3	3	3	3	1			1	1			1	3	
19A554L.3	3	3	3	3	3									3	3
19A554L.4	3	3	3	3	3									3	3
19A555L.5	3	3	3		3						2			3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course	Universal Human Values – II
Category	HS
Course Code	19AC53T
Year	III B. Tech
Semester	I Semester
Branch	CE, ME, CSE

Lecture Hours	Tutorial Hours	Practical	Credits
1	1	-	2

Course Objectives:

- Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
- Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
- Strengthening of self-reflection
- Development of commitment and courage to act

Unit 1 Course Introduction - Need, Basic Guidelines, Content and Process for Value Education 6

- Purpose and motivation for the course, recapitulation from Universal Human Values-I
- Self-Exploration–what is it? - Its content and process; ‘Natural Acceptance’ and
- Experiential Validation- as the process for self-exploration
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facility- the basic requirements for
- fulfilment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

Unit 2 Understanding Harmony in the Human Being - Harmony in Myself! 6

- Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’
- Understanding the needs of Self (‘I’) and ‘Body’ - happiness and physical facility
- Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
- Understanding the harmony of I with the Body: Sanyam and Health; correct
- appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure Sanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one’s own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Unit 3 Understanding Harmony in the Family and Society- Harmony in Human- Human Relationship 6

- Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
- Understanding the meaning of Trust; Difference between intention and competence
- Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives

Unit 4 Understanding Harmony in the Nature and Existence -Whole existence as Coexistence 6

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature
- Understanding Existence as Co-existence of mutually interacting units in all pervasive space
- Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

Unit 5 Implications of the above Holistic Understanding of Harmony on Professional Ethics 6

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
- Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.

Prescribed Text Books

1. R R Gaur, R Asthana, G P Bagaria, "A Foundation Course in Human Values and Professional Ethics", 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
2. R R Gaur, R Asthana, G P Bagaria, "Teachers' Manual for A Foundation Course in Human Values

and Professional Ethics”, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books

1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan VidyaPrakashan, Amar kantak, 1999.
2. N. Tripathi, “Human Values”, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. Mohandas Karamchand Gandhi “The Story of My Experiments with Truth”
5. E. F.Schumacher. “Small is Beautiful”
6. Slow is Beautiful –Cecile Andrews
7. J C Kumarappa “Economy of Permanence”
8. PanditSunderlal “Bharat Mein Angreji Raj”
9. Dharampal, “Rediscovering India”
10. Mohandas K. Gandhi, “Hind Swaraj or Indian Home Rule”
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland(English)
13. Gandhi - Romain Rolland (English)

Course Outcomes:

	Blooms Level of Learning
1. Students are expected to become more aware of themselves, and their surroundings (family, society, nature)	L2
2. They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.	L2
3. They would have better critical ability.	L2
4. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).	L2
5. It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.	L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
19AC53T.1												3
19AC53T.2												3
19AC53T.3												3
19AC53T.4												3
19AC53T.5												3

Assessment pattern for UHV-2

Assessment Pattern for Universal Human Values-II courses assessment is described hereunder.

UHV-2 course carries two credits. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation.

A student has to secure 40% marks out of 100 in the CIE and SEE together to qualify for the award of the degree. The distribution shall be 50 marks for continuous internal assessment and 50 marks for semester end examination.

Internal evaluation shall be conducted for the course during semester and shall be evaluated for 50 marks and distributions of marks as follows:

Department of Computer Science and Engineering

- Assessment by faculty mentor: 10 marks
- Self-assessment: 10 marks
- Assessment by peers: 10 marks
- Socially relevant project/Group Activities/Assignments: 20 marks

Semester End examination is done for 50 marks and is of 2 hours duration. The question paper shall be of subjective type with 5 questions, one question from each unit, with internal choice. All the questions carry equal marks of 10 each.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Microprocessor & Interfacing
 Category : ES
 Course Code : 19A461T
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able

- To know the basic concepts of first 16 bit general purpose Microprocessor
- To learn the Programming and Interfacing Concepts of Microprocessors

Unit 1 : 8086 ARCHITECTURE & PROGRAMMING 13

Overview of 8085 processor architecture, Architecture of 8086 microprocessor, Register organization, Memory organization, and Machine language instruction formats of 8086. Addressing modes of 8086, Instruction set of 8086, Assembler directives, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation. Procedure and Macros.

Unit 2 : MEMORY INTERFACING 13

Pin diagram of 8086 - Minimum mode and maximum mode of operation, Timing diagrams. I/O Interfacing methods – I/O mapped I/O, Memory mapped I/O. Basic structure of SRAM and DRAM cell, Memory interfacing to 8086 (static RAM and EPROM). Need for DMA, Architecture of 8257 and interfacing with 8086.

Unit 3 : I/O INTERFACING & PROGRAMMABLE INTERRUPT CONTROLLER (8259) 12

Interfacing I/O ports – latches and buffers. 8255 PPI - Architecture, various modes of operation and interfacing to 8086. Seven segment Displays, Stepper motor, D/A, A/D converter interfacing. Datatransfer methods-Programmed I/O, interrupt driven I/O. Interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture and interfacing, cascading of interrupt controller. Simple programs.

Unit 4 : PROGRAMMABLE INTERVAL TIMER/COUNTER (8253) & COMMUNICATION INTERFACE 07

Architecture of 8253 programmable interval timer/counter, mode of operations, interfacing with 8086. Asynchronous and synchronous data transfer schemes. Necessity of communication interfaces, 8251 USART architecture and interfacing, RS-232C. TTL to RS232C and RS232C to TTL conversion. Sample program of serial data transfer.

Unit 5 : ADVANCED MICROPROCESSORS 05

Introduction to 80286, salient features of 80386, Real and Protected mode Segmentation and Paging, salient features of Pentium and Pentium pro processors.

Prescribed Text Books:

1. Advanced microprocessor and peripherals- A.K. Ray and K.M.Bhurchandi, 2nd edition, TMH,2000
2. Microprocessors and Interfacing- Douglas V.Hall, 2nd edition,2007

Reference Text books:

1. The 8086 and 8088 Microprocessors- Walter A. Triebel, Avtar Singh, PHI, 4th Edition,2003
2. Micro computer system 8066/8088 family Architecture, programming and Design-By Liu and GA

Gibson, PHI, 2ndEd

3. Intel 8086/8088 microprocessor architecture, programming, design and interfacing, Bhupendrasinghchabra, Dhanpat Raipublications

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-------------------------------------------------------------------------------------------------------|--------|
| 1. Know the Architectural features and programming of 8086.. | L1, L3 |
| 2. Interface various Intel devices with 8086. | L3 |
| 3. Understand the Interrupt structure of 8086 and servicing the interrupts using interrupt controller | L2 |
| 4. Know the Salient features of advanced microprocessors | L1 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
19A461T.1	3	-	-	-	2	2	-	-	1	-	-	-	1	-	-
19A461T.2	3	3	-	-	3	-	-	-	-	-	-	-	1	-	-
19A461T.3	2	-	-	-	-	-	-	-	-	-	-	-	1	-	1
19A461T.4	3	-	-	-	2	-	-	-	-	-	-	-	1	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Compiler Design
 Category : PC
 Course Code : 19A561T
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Describe the design of a compiler including its phases and components.
- Demonstrate top down parser.
- Organize bottom up parser and syntax directed translation.
- Evaluate conversion of popular programming language constructs into Intermediate code forms and symbol table format.
- Distinguish different optimization techniques and design object code generation algorithms in the design of compiler.

Unit 1 : Overview of Compilation 7
 Phases of Compilation – Lexical Analysis, Regular Grammar and Regular Expression for common programming language features, pass and Phases of translation, Interpretation, Bootstrapping, data structures in compilation – LEX lexical analyzer generator.

Unit 2 : Top down Parsing 9
 Context free grammars, Top down parsing – Backtracking, LL(1), Recursive Descent Parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

Unit 3 : Bottom up parsing 12
 Operator precedence, Shift Reduce parsing, SLR, CLR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator. Semantic analysis: Attributed grammars, Syntax directed translation, L-attributed definition, Top Down & Bottom Up evaluation of expressions, Type checking.

Unit 4 : Intermediate code generation 12
 Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Conversion of popular Programming language Constructs into Intermediate code forms. Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non-block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

Unit 5 : Code optimization and generation 9
 Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation. Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation, Machine dependent code optimization. Object code generation: Object code forms, register allocation and assignment generic code generation algorithms, DAG for register allocation.

Prescribed Text books:

1. Principles of compiler design -A.V. Aho. J.D.Ullman; Pearson Education.

2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

Reference Text Books:

1. Lex&yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design- Dick Grune, Henry E. Bal, Criel T. H. Jacobs, Wiley dreamtech.
3. Engineering a Compiler-Cooper & Linda, Elsevier
4. Compiler Construction, Loudon, Thomson. "Principles of Compiler Design", Aho. A.V & Ullman J.D, Narosa publications, 1985

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|--------------------------------------------------------------------------------------------------------------|----|
| 1. Understand the compiler implementation. | L2 |
| 2. Design top down parser | L4 |
| 3. Design bottom up parser and examine syntax directed translation. | L4 |
| 4. Implementation of the intermediate code forms and symbol table. | L5 |
| 5. Apply different optimization techniques and develop code generation algorithms in the design of compiler. | L3 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A561T.1	3	-	-	-	3	-	3	-	-	-	-	1	3	3	3
19A561T.2	-	3	-	3	3	2	-	-	-	-	2	-	-	3	-
19A561T.3	3	3	-	3	3	-	3	-	-	-	-	-	3	-	3
19A561T.4	3	3	2	3	-	-	3	-	-	-	-	-	3	-	3
19A561T.5	3	-	2	3	3	2	3	-	1	-	2	-	-	3	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Object Oriented Analysis and Design
 Category : PC
 Course Code : 19A562T
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
2	0	0	2

Course Objectives: This course will Provide

- Introduction to modeling and overview of UML
- Designing Class & Object diagrams with the help of advanced structural modeling.
- Create use-case & interaction diagrams to model behavior of a Software system.
- Designing and implementing state machines using advanced behavioral modeling.
- Modeling subsystems using component and deployment diagrams.

Unit 1 : Introduction to UML and Basic Structural Modeling 9
 Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, and Software Development Life Cycle.
 Classes, Relationships, common Mechanisms, and diagrams.

Unit 2 : Advanced Structural Modeling, Class & Object Diagrams 8
 Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.
 Terms, concepts, modeling techniques for Class & Object Diagrams. Design class diagram for Library information system.

Unit 3 : Basic Behavioral Modeling-I & II 8
 Interactions, Interaction diagrams.
 Use cases, Use case Diagrams, Activity Diagrams. Design Use cases, Use case diagrams, Interaction diagram and Activity diagram for library system.

Unit 4 : Advanced Behavioral Modeling 7
 Events and signals, state machines, processes and Threads, time and space, state chart diagrams.
 Design state machine for different objects in library system.

Unit 5 : Architectural Modeling 7
 Component, Deployment, Component diagrams and Deployment diagrams. Design & document of library system.

Text Books:

1. Grady Booch, James Rumbaugh, IvarJacobson: The Unified Modeling Language User Guide, Pearson Education.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

Reference Text books:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt. Ltd.

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|------------------------------------------------------------------------------------|--------|
| 1. Learn the fundamental principles of Object Oriented modeling | L1 |
| 2. Understand class and object diagrams for software systems. | L2 |
| 3. Identify the system behavior using use case and interaction diagrams. | L2 |
| 4. Modeling states and state machines using advanced behavioral modeling. | L3 |
| 5. Analyzing and implementing system architecture by using Architectural concepts. | L3, L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A562T.1	2	2					1			3			3	-	-
19A562T.2	2	2		1					3				3	-	3
19A562T.3			3						3	3	2		-	-	3
19A562T.4			3		2				3	3			-	-	-
19A562T.5			3		2					3	2		3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : .Net Technologies
Category : PE
Course Code : 19A56AT
Year : III B. Tech.
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This Course will able to:

- Understand ecosystem of .NET framework and basic Concepts of C#.Net.
- Understand and Apply object oriented programming concepts to develop C#.Net applications.
- Understand & Apply the basic window based controls.
- Apply window based programming to Build SDI&MDI Applications.
- Understand & Apply data base connectivity through ADO.NET and Implement server side programming concepts through ASP.NET framework.

UNIT-I: 9

Introduction to C#: .NET Framework, What is C#, writing a C# program, Variables and Expressions
Flow control – Branching & Looping.

Control structures in C#: Type conversion – Implicit & Explicit, Complex variable types- Arrays,
Structures & Enumerations, Functions, Error handling.

UNIT-II: 9

Introduction to OOP using C#: OOP Techniques – Inheritance, Polymorphism, Interfaces, Events
Defining classes, Defining class members –Member definitions, Collections, Generics –Using generics.

UNIT-III: 9

Basic windows programming: Controls –Button, Label, Link Label, Text Box, Radio Button, Check Box,
Rich Text Box, List Box, Checked List Box, List View, Tab Control

UNIT-IV: 9

Advanced windows programming: Menus, Toolbars, Single Document Interface (SDI), Multiple Document
Interface (MDI) application, Building MDI applications.

UNIT-V: 9

Introduction to ADO.NET and ASP.NET: ADO.NET – Data Access components, Database programming
with SQL SERVER .ASP.NET – Creating a simple page, Server controls.

Text Books:

1. Harsh Bhasin, Programming in C#, Oxford University Press 2014, New Delhi.
2. Karli Watson, Christian Nagel, Jacob Vibe Hammer, Jon D. Reid, Morgan Skinner, Daniel Kemper, Beginning Visual C# 2012 Programming, Published by Jhon Wiley & sons, Inc.,
3. Dan Clark, Beginning C# Object Oriented Programming, New York, 2013, 2ndEdition.

Reference Books:

1. John Sharp, Microsoft Visual C# 2013 Step by Step, Microsoft Press, Washington,2013.Kogent, ASP.NET 3.5 Black Book, Dream Tech Publications, 2010.
2. E. Balagurusamy, Programming in C#, Tata McGraw-Hill Publisher 2010, New Delhi, 3rdEdition.

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Understand the fundamentals of .NET framework and basic Concepts of C#.Net	L2
2. Implement Object oriented programming concepts through C#.NET framework.	L3
3. Apply window based controls to develop GUI Applications	L3
4. Understand the working of Advanced Window Programming to Build MDI Applications	L2
5. Understand & Apply ADO.NET to access data and data services from a database and ASP.NET to build dynamic sites and web applications.	L2, L3

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56AT.1	3	-	3	-	3	-	-	-	-	-	-	-	3	-	-
19A56AT.2	3	-	3	-	3	3	-	-	3	-	-	3	3	-	3
19A56AT.3	3	-	3	-	3	3	-	-	3	-	-	3	3	-	3
19A56AT.4	3	-	3	-	3	3	-	-	3	-	-	3	3	-	3
19A56AT.5	3	-	3	-	3	3	-	-	3	-	-	3	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Machine Learning
 Category : PE
 Course Code : 19A56BT
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Formulate machine learning problems corresponding to different applications.
- Understand machine learning algorithms along with their strengths and weaknesses.
- Understand the basic theory underlying machine learning.
- Apply machine learning algorithms to solve problems of moderate complexity.
- Understand different types of learning approaches.

Unit 1 : *Introduction* 9

Well-posed learning problems, Designing a learning system, Perspectives and issues in machine learning
 Concept learning and the general to specific ordering – Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias .

Unit 2 : *Decision Tree learning & Artificial Neural Networks* 9

Decision Tree learning – Introduction, Decision tree representation, Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning
 Artificial Neural Networks – Introduction, Neural network representation, Appropriate problems for neural network learning, Perceptrons, Multilayer networks and the back propagation algorithm, Remarks on the back propagation algorithm, An illustrative example face recognition Advanced topics in artificial neural networks

Unit 3 : *Bayesian learning & Genetic Algorithms* 9

Bayesian learning – Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle, Bayes optimal classifier, Gibbs algorithm, Naïve Bayes classifier, An example learning to classify text, Bayesian belief networks The EM algorithm
 Genetic Algorithms – Motivation, Genetic Algorithms, An illustrative Example, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

Unit 4 : *Learning Sets of Rules & Analytical Learning* 9

Learning Sets of Rules – Introduction, Sequential Covering Algorithms, Learning Rule Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution
 Analytical Learning - Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge.

Unit 5 : *Combining Inductive and Analytical Learning & Reinforcement Learning* 9

Combining Inductive and Analytical Learning – Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis, Using Prior Knowledge to Alter the Search Objective,

Using Prior Knowledge to Augment Search Operators,
 Reinforcement Learning – Introduction, The Learning Task, Q Learning, Non-Deterministic Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

Prescribed Text Books:

1. Machine Learning – Tom M. Mitchell, - MGH
2. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis (CRC)

Reference Text books:

1. Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh, Cambridge Univ Press.
2. Richard o. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley & Sons Inc., 2001
3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. understand the basic knowledge about the key algorithms and theory that form the foundation of machine learning and computational intelligence	L1
2. Learn and use different machine learning algorithms	L2
3. apply various machine learning algorithms to neural network and genetic approaches	L3
4. Design the classification, pattern recognition, optimization and decision problems using machine learning algorithms	L4
5. Analyze different types of learning approaches.	L5

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56BT.1	3	3	3	1		1			1			3	3	3	
19A56BT.2	3		3		3							3	3	3	
19A56BT.3	3	3	3		3								3		
19A56BT.4	3	3	3									3	3		
19A56BT.5	3		3		3							3	3	3	

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Mobile Communications
 Category : PE
 Course Code : 19A56CT
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the basic concepts of mobile computing.
- Learn the basics of mobile telecommunication system.
- Familiar with the network layer protocols and Ad-Hoc networks.
- Know the basis of transport and application layer protocols.
- Gain knowledge about different mobile platforms and application development.

Unit 1 : INTRODUCTION 9
 Introduction to Mobile Computing – Applications of Mobile Computing- Generations of Mobile Communication Technologies- Multiplexing – Spread spectrum -MAC Protocols – SDMA- TDMA- FDMA- CDMA

Unit 2 : MOBILE TELECOMMUNICATION SYSTEM 9
 Introduction to Cellular Systems - GSM – Services & Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security – GPRS- UMTS – Architecture – Handover – Security

Unit 3 : MOBILE NETWORK LAYER 9
 Mobile IP – DHCP – AdHoc– Proactive protocol-DSDV, Reactive Routing Protocols – DSR, AODV , Hybrid routing –ZRP, Multicast Routing- ODMRP, Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.

Unit 4 : MOBILE TRANSPORT AND APPLICATION LAYER 9
 Mobile TCP– WAP – Architecture – WDP – WTLS – WTP –WSP – WAE – WTA Architecture – WML

Unit 5 : MOBILE PLATFORMS AND APPLICATIONS 12
 Mobile Device Operating Systems – Special Constraints & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – MCommerce – Structure – Pros & Cons – Mobile Payment System – Security Issues

Prescribed Text books:

1. Jochen Schiller, –Mobile CommunicationsII, PHI, Second Edition, 2003.
2. Prasant Kumar Pattnaik, Rajib Mall, –Fundamentals of Mobile ComputingII, PHI Learning Pvt.Ltd, New Delhi – 2012

Reference Text Books:

1. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2005.
2. Uwe Hansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, –Principles ofMobile ComputingII, Springer, 2003.
3. William.C.Y.Lee, –Mobile Cellular Telecommunications-Analog and Digital SystemsII, Second

Edition, TataMcGraw Hill Edition ,2006.

4. C.K.Toh, –AdHoc Mobile Wireless NetworksII, First Edition, Pearson Education, 2002.
5. Android Developers : <http://developer.android.com/index.html>
6. Apple Developer : <https://developer.apple.com/>
7. Windows Phone DevCenter : <http://developer.windowsphone.com>
8. BlackBerry Developer : <http://developer.blackberry.com>

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-----------------------------------------------------------------------------------------------------------------|----|
| 1. understand the basics of mobile telecommunication systems | L2 |
| 2. learn the generations of telecommunication systems in wireless networks | L2 |
| 3. Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network | L2 |
| 4. Analyze the functionality of Transport and Application layers | L4 |
| 5. Identify the mobile applications using android/blackberry/ios/windows SDK | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56CT.1	3	3									2	3	3		
19A56CT.2	3	3		3		3							3		
19A56CT.3	3	3	3		3	3	2			1		3	3	2	
19A56CT.4	3	3	3			3						3	3		
19A56CT.5		3	3	3	3		2					3	3	2	

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Performance Evaluation of Computer Systems
 Category : PE
 Course Code : 19A56DT
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the mathematical and science fundamentals needed for performance evaluation of computer systems and metrics
- Study measurement techniques and tools such as workloads, arts of workload selection and Markov models
- Understand the simulation, simulation work flow and analysis of simulation results used for performance evaluation.
- Study analytical modeling such as *queuing* models including analysis of single queue, network of queues
- Study the analysis of computer architectures, computer network components, simulation modeling of local area networks

Unit 1 : *Introduction to Performance Evaluation* 9

The Art of Performance Evaluation, Professional Organizations, Journals, and Conferences, Performance Projects, Common Mistakes and How To Avoid Them: Common Mistakes In Performance Evaluation, A Systematic Approach To Performance Evaluation, Selection of Techniques And Metrics: Selecting An Evaluation Technique, Selecting Performance Metrics, Utility Classification Of Performance Metrics, Setting Performance Requirements

Unit 2 : *Workload and Markov Models* 9

Measurement Techniques And Tools: Types Of Workloads, Addition Instruction, Instruction Mixes, Kernels, Synthetic Programs, Application Benchmarks, Popular Benchmarks, The Art of Workload Selection: Services Exercised, Level Of Detail, Representativeness, Timeliness, Other Considerations In Workload Selection, Workload Characterization Techniques: Terminology, Averaging, Specifying Dispersion, Single-Parameter Histograms, Multi parameter Histograms, Principal-Component Analysis, Markov Models, Clustering

Unit 3 : *Simulation and Simulation Results* 9

Simulation: Introduction To Simulation, Common Mistakes In Simulation, Other Causes Of Simulation Analysis Failure, Terminology, Selecting A Language For Simulation, Types Of Simulations, Event-Set Algorithms, Analysis of Simulation Results: Model Verification Techniques, Model Validation Techniques, Transient Removal, Terminating Simulations, Stopping Criteria: Variance Estimation, Variance Reduction

Unit 4 : *Queuing Models and Network of Queues* 9

Queuing Models: Introduction To Queuing Theory, Queuing Notation, Rules For All Queues, Little's Law, Types Of Stochastic Processes, Analysis Of A Single Queue: Birth-Death Processes, M/M/1 Queue, M/M/M Queue, M/M/M/B Queue With Finite Buffers, Results For Other Queuing Systems, Queuing Networks: Open And Closed Queuing Networks, Product Form Networks, Queuing Network Models Of Computer Systems

Unit 5 : *Analysis of Computer Architectures and Computer Network Components* 9
 Analysis of Computer Architectures: Introduction, Central Server Computer System, Multiple Server
 Computer System, Petri Net Example, Analysis of Computer Network Components: Introduction,
 Analytical Modeling Examples, Simulation Modeling of Local Area Networks Architectures

Prescribed Text books:

1. Raj Jain, *The Art of Computer System Performance Analysis: Techniques for Experimental Design Measurements Simulation and Modeling*, Wiley, (2015).
2. Paul J. Fortier and Howard E. Michel, "Computer Systems Performance Evaluation and Prediction", Elsevier, 2003.

Reference Text Books:

1. David J. Lilja, "Measuring Computer Performance: A Practitioner's Guide", Cambridge University Press, 2000.
2. MorHarchol-Balter, *Performance Modeling and Design of Computer Systems*, Cambridge. (2013).

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Understand the art of performance evaluation selection of techniques and metrics.	L1
2. Identify and apply measurement techniques and tools, the art of workload selection, workload characterization techniques.	L1,L3
3. Apply simulation and analyze simulation tools.	L3
4. Analyze <i>queuing</i> models and <i>queuing</i> networks.	L4
5. analysis of Computer Architectures, Computer Network Components	L4

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56DT.1	3	3		3	-	-	-	-	-	-	-	-	3	-	-
19A56DT.2	3	3	2	3	-	-	-	-	-	-	-	-	3	2	
19A56DT.3	3	3	2	3	-	-	-	-	-	-	-	-	3	2	1
19A56DT.4	3	3	-	3	-		-	-	-	-	-	-	3	2	-
19A56DT.5	3	3		3	-	-	-	-	-	-	-	-	3		

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Advanced Computer Architecture
 Category : PE
 Course Code : 19A56ET
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Learn Program, Network Properties of various parallel computer models.
- Know about new trends in Operating and designing various parallel computers.

Unit 1 : 9

Parallel Computer Models: - The state of computing-Multiprocessors and Multi computers- Multivector and SIMD Computers-PRAM and VLSI Models.

Program and Networks Properties: - Conditions of Parallelism- Program Partitioning and Scheduling- Program Flow Mechanisms-System Interconnect Architectures.

Principles of Scalable Performance: - Performance Metrics and Measures- Parallel Processing Applications-Speedup Performance Laws-Scalability Analysis and Approaches, Architectural Development Track.

Unit 2 : 9

Processors and Memory Hierarchy: - Advanced Processor Technology-Superscalar and Vector Processors- Memory Hierarchy Technology.

Bus, Cache and Shared Memory: - Bus Systems-Cache Memory Organizations-Shared-Memory Organizations.

Unit 3 : 11

Pipelining and Super Scalar Techniques: - Linear Pipeline Processors-Nonlinear Pipeline Processors- Instruction Pipeline Design.

Multiprocessors and Multi computers: -Multiprocessor System Interconnects-Cache Coherence and Synchronization Mechanisms-Message-Passing Mechanisms.

Unit 4 : 9

Multivector and SIMD Computers: - Vector Processing Principles-Multivector Multiprocessors-Compound Vector Processing-SIMD Computer Organizations-The Connection Machine CM-5.

Scalable, Multithreaded, and Dataflow Architectures: - Latency –Hiding Techniques-Principles of Multithreading-Scalable and Multithreaded Architectures- Dataflow and Hybrid Architectures.

Unit 5 : 9

Instruction Level Parallelism:- Introduction-Basic Design Issues-Problem Definition-Model of a Typical Processor- Operand Forwarding-Reorder Buffer-Register Renaming-Tomasulo's Algorithm- Branch Prediction- Limitations in Exploiting Instruction Level Parallelism-Thread Level Parallelism. Trends in Parallel Systems: - Forms of Parallelism-Case Studies: AMD Opteron, Intel Pentium Processors.

Prescribed Text books:

1. Advanced Computer Architecture- by Kai Hwang &Jotwani, 3rd Edition, McGraw-Hill Publications.

Reference Text Books:

1. Advanced Computer Architecture, D.Sima, T.Fountain, P.Kacsuk, Pearson Education.
2. Computer Architecture A quantitative approach 3rd edition john L.Hennessy& David A. Patterson, Morgan Kufmann(An Imprint of Elsevier).
3. Computer Architecture and parallel processing by Hwang and Briggs.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-----------------------------------------------------------------------------------------------------|--------|
| 1. Calculate performance measures of different parallel computers. | L1, L3 |
| 2. Find the difference between parallel computer with and without shared-memory organization. | L3 |
| 3. Analyze Instruction Pipeline and message passing techniques. | L4 |
| 4. Find out differences between properties of Data Flow Architectures and other types. | L3 |
| 5. Know about design issues of a processor and the parallelism used in various advanced processors. | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56ET.1	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
19A56ET.2	3	3	3	3	-	-	-	-	-	-	-	-	3	3	-
19A56ET.3	3	3	3	3	1	-	-	-	-	-	-	-	-	-	-
19A56ET.4	3	3	3	-	-	2	-	-	-	-	-	-	-	-	-
19A56ET.5	3	3	3	-	-	2	-	-	-	-	-	1	3	3	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : High Performance Computing
 Category : PE
 Course Code : 19A56FT
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

6. Understand the concepts of different computing techniques.
7. Apply grid computing concepts to learn OGSA.
8. Analyze the concepts of cluster computing.
9. Analyze the setup and administration of cluster.
10. Create high availability clusters.

Unit 1 : INTRODUCTION: 9

Introduction: Cluster and Grid computing, Meta computing, Web services and Grid Computing, e-Governance and the Grid

Technologies and Architectures for Grid Computing: Issues in Data Grids, Functional requirements in Grid Computing, Standards for Grid Computing, Recent technologies trends in Large Data Grids.

Web Services and the Service Oriented Architecture: Service Oriented Architecture, SOAP and WSDL, Creating Web Services, Server Side.

Unit 2 : OGSA 9

OGSA and WSRF: OGSA for Resource Distribution, Stateful Web Services in OGSA, WSRF, WSRF Specification

Globus Toolkit: History, version, Applications, Approaches and Benefits, Infrastructure Management, Monitoring and Discovery, Security, Data Choreography and Coordination, GT4 Architecture, GT4 Containers.

The Grid and Databases: Requirements, Storage Request Broker, Integration of Databases with the Grid, Architecture of OGSA-DAI for offering Grid Database services.

Unit 3 : CLUSTER COMPUTING AND CLUSTER MIDDLEWARE 9

Cluster Computing: Approaches to Parallel Computing, Definition and Architecture of a Cluster, Categories of clusters.

Cluster Middleware: Levels and Layers of Single System Image, Design objectives, Resource Management and Scheduling, Cluster programming Environment and Tools.

Unit 4 : CLUSTER NETWORKING AND SETTING UP CLUSTER 9

Networking, Protocols and I/O for clusters: Networking and Interconnection/Switching Devices, Design Issues, Design Architecture, HiPPI, ATM, Myrinet, Memory Channel

Setting Up and Administering a Cluster: Setup of simple cluster, setting up nodes, clusters of clusters, System monitoring, Global Clocks Sync.

Unit 5 : HIGH AVAILABILITY AND PROCESS SCHEDULING

9

Cluster Technology for High Availability: High availability clusters, high availability parallel computing, types of failures and errors, cluster architectures and configurations for high availability, Failure/Recovery clusters.

Process Scheduling: Job management System, Resource management system, policies of resource utilization, Scheduling policies.

Prescribed Text Books:

1. Grid and Cluster Computing by C.S.R. Prabh, PHI

Reference Text books:

1. Fundamentals of Grid Computing: Theory, Algorithms and Technologies (Chapman & Hall/Crc Numerical Analysis and Scientific Computing) 1st Edition.
2. High Performance Cluster Computing - Vol. 1 Raj Kumar Buyya Pearson Publications.
3. High Performance Cluster Computing: Programming and Applications, Volume 2 Raj Kumar Buyya Prentice Hall Publications.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|----------------------------------------------------------------------|----|
| 1. Understand the basic concepts of different computing techniques. | L1 |
| 2. Apply grid computing concepts to learn OGSA platform. | L3 |
| 3. Analyze the concepts of cluster computing and cluster middleware. | L4 |
| 4. Analyze the setup and administration of cluster. | L4 |
| 5. Examine high availability clusters and process scheduling. | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56GT.1	3	-	-	-	-	-	-	-	-	-	3	-	-	-	3
19A56GT.2	3	3	3	-	3	-	3	-	-	-	3	3	3	-	3
19A56GT.3	3	3	3	-	3	-	3	-	-	-	-	3	3	-	3
19A56GT.4	3	3	-	-	3	-	-	-	-	-	3	3	3	3	3
19A56GT.5	3	3	3	-	3	-	3	-	-	-	-	3	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Software Testing Methodologies
 Category : PE
 Course Code : 19A56GT
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- understand the fundamental concepts of software testing, including software testing objectives, the taxonomy of bugs
- analyze testing techniques such as path testing and transaction flow testing
- understand the concepts of data flow testing and its applications
- build the paths and decision tables for a software project
- apply the concepts of State Graphs, Transition Testing and Graph Testing

Unit 1 : INTRODUCTION: 9
 Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

Unit 2 : FLOW GRAPHS AND PATH TESTING: 9
 Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

Unit 3 : TRANSACTION FLOW TESTING & DOMAIN TESTING 9
 Transaction flows, transaction flow testing techniques. Dataflow testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. DOMAIN TESTING: Domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing.

Unit 4 : PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS 9
 Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. LOGIC BASED TESTING: Overview, decision tables, path expressions, kv charts, and specifications.

Unit 5 : STATE, STATE GRAPHS AND TRANSITION TESTING 9
 State graphs, good & bad state graphs, state testing, GRAPH MATRICES AND APPLICATION
 Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

Prescribed Text Books:

1. BarisBeizer, *Software testing techniques*. Dreamtech, 2nd Edition.

Reference Text books:

1. Dr.K.V.K.K.Prasad, *Software Testing Tools*. Dreamtech.
2. Brian Marick, *The craft of software testing*. Pearson Education.

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|--------------------------------------------------------------------------------------|----|
| 1. Understand the concepts of software testing and taxonomy of bugs. | L1 |
| 2. Construct control flow graphs for different programs. | L3 |
| 3. Apply data flow testing for software projects. | L4 |
| 4. Build paths and decision tables for various problems | L5 |
| 5. Analyze state graphs for different problems and apply transition testing on them. | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56GT.1	-	-	-	-	-	-	-	-	3	-	3	-	-	-	3
19A56GT.2	3	3	3	-	3	-	-	-	3	-	3	3	3	-	3
19A56GT.3	3	-	3	-	3	-	-	-	-	-	-	3	3	-	3
19A56GT.4	3	3	-	-	3	-	-	-	3	-	3	3	3	2	3
19A56GT.5	3	3	3	-	3	-	-	-	-	-	-	3	3	2	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Visual Programming
Category : PE
Course Code : 19A56HT
Year : III B. Tech.
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

6. Understand the basic concepts of Windows programming
7. know about develop applications using Visual Basic Programming
8. learn the basic of Visual C++ Programming
9. know about the Design windows programming and applications

Unit 1 : *WINDOWS PROGRAMMING* 9

The windows programming Model – Event driven programming – GUI concepts – Overview of Windows programming – Creating and displaying the window – Message Loop – windows procedure – WM_PAINT message – WM_DESTROY message – Data types – Resources – An Introduction to GDI – Device context – Text output – Scroll Bars – Keyboard – Mouse – Menus

Unit 2 : *VISUAL BASIC PROGRAMMING* 9

Visual Basic Applications – Form and properties – Variables and Constants – Variant type – Procedure scope – Main – Control statements – control arrays – Creating and using Controls – Menus and Dialogs – Programming fundamentals – Objects and instances – Debugging – Responding to mouse events – Drag and Drag drop events Responding to keyboard events – keypress, keyup, keydown events – Using grid control – Graphics controls – shape and line control – File system controls – Common dialog controls – Processing files – Accessing databases with the data controls..

Unit 3: *VISUAL C++ PROGRAMMING* 9

Visual C++ components – Introduction to Microsoft Foundation Classes Library – Getting started with AppWizard – Class Wizard – Event handling – Keyboard and Mouse events - WM_SIZE, WM_CHAR messages Graphics Device Interface - Pen, Brush, Colors, Fonts - Single and Multiple document interface - Reading and Writing documents - Resources – Bitmaps creation, usage of BMP and displaying a file existing as a BMP.

Unit 4 : *CONTROLS* 9

Dialog Based Applications, controls – Animate control, image list, CRect tracker – Tree control – CtabControl Dynamic controls – slider control – progress control – Inheriting CTreeView – CRicheditView – Modal Dialog, Modeless Dialog – CColorDialog – CFileDialog.

Unit 5 : *ADVANCED CONCEPTS* 9

Domain Name System – Simple Status bars – Splitter windows and multiple views – Dynamic Link Library – Data base Management with ODBC – TCP/IP – Winsock and WinInet, – ActiveX control – creation and usage Container class.

Prescribed Text books:

1. Charles Petzold, "Windows Programming", Microsoft press, 1996.
2. J. David Kruglirski, "Programming Microsoft Visual C++", Fifth Edition, Microsoft press, 1998.

3. Marion Cottingham "Visual Basic", Peachpit Press, 1999.

Reference Text Books:

1. Steve Holzner, "Visual C++ 6 programming", Wiley Dreamtech India Private Ltd., 2003.
2. Kate Gregory "Using Visual C++", Prentice Hall of India Pvt., Ltd., 1999.
3. Deitel, "Visual Basic 6.0 How To Program", Pearson Education, 1999.

Course Outcomes:

Student will be able to

1. Understand the concepts of Windows programming
2. Develop applications using Visual Basic Programming
3. Understand the basic of Visual C++ Programming
4. Design windows programming and Applications
5. Develop Web based controls

Blooms Level of Learning

L1,L2, L3
L1,L2, L3
L1,L2, L3
L2, L3
L3

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A56HT.1	3			-	3		-	-	-	-	-	-	3	-	-
19A56HT.2	-	3		2	3	3	-	-	-	-	-	-	3	2	2
19A56HT.3	3	3	2	2	3	3	-	-	-	-	-	-	3	2	2
19A56HT.4	3	3	3	3	3		-	-	-	-	-	-	3	-	-
19A56HT.5	3	3	3	-	3		-	-	-	-	-	-	3	2	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course: Basic Civil Engineering
Category : OE
Course Code : 19A16GT
Year : III B. Tech.
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives:

- To give an understanding to the students of the vast breadth and numerous areas of engagement available in the overall field of Civil Engineering.
- To motivate the student to pursue a career in one of the many areas of Civil Engineering with deep interest and keenness.
- To expose the students to the various avenues available for doing creative and innovative work in this field by showcasing the many monuments and inspiring projects of public utility.

Unit 1 : (8hrs)

Basic Understanding: What is Civil Engineering/ Infrastructure? Basics of Engineering and Civil Engineering; Broad disciplines of Civil Engineering; Importance of Civil Engineering, Possible scopes for a career.

History of Civil engineering: Early constructions and developments over time; Ancient monuments & Modern marvels; Development of various materials of construction and methods of construction; Works of Eminent civil engineers

Unit 2 : (10hrs)

Overview of National Planning for Construction and Infrastructure Development; Position of construction industry vis-à-vis other industries, five year plan outlays for construction; current budgets for infrastructure works;

Fundamentals of Building Materials: Stones, bricks, mortars, Plain, Reinforced & Prestressed Concrete, Construction Chemicals; Structural Steel, High Tensile Steel, Carbon Composites; Plastics in Construction; 3D printing; Recycling of Construction & Demolition wastes.

Unit 3 : (10hrs)

Environmental Engineering & Sustainability: Water treatment systems; Effluent treatment systems; Solid waste management; Sustainability in Construction;

Geotechnical Engineering: Basics of soil mechanics, rock mechanics and geology; various types of foundations; basics of rock mechanics & tunnelling.

Unit 4 : (8hrs)

Hydraulics & Water Resources Engineering: Fundamentals of fluid flow, basics of water supply systems; Underground Structures; Underground Structures Multi-purpose reservoir projects.

Surveying & Geomatics: Traditional surveying techniques, Total Stations, Development of Digital Terrain Models; GPS, LIDAR;

Unit 5 : (8hrs)

Computational Methods, IT, IoT in Civil Engineering: Typical software used in Civil Engineering- Finite Element Method, Computational Fluid Dynamics; Computational Geotechnical Methods; highway design (MX), Building Information Modelling; Highlighting typical available software systems (STAAD, ETAB & AUTOCAD)

Prescribed Text Books:

1. Chudley, R., Greeno (2006), 'Building Construction Handbook' (6th ed.), R. Butterworth-Heinemann
2. Hydraulics and Fluid Mechanics, P M Modi and S M Seth, Standard Book House
3. Madhu, N, Sathikumar, R and Satheesh Gobi, Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson India, 2006.
4. Geotechnical Engineering: Principles and Practices of Soil Mechanics and Foundation Engineering (Civil and Environmental Engineering) by V.N.S. Murthy
5. Building Planning & Drawing by Dr N. Kumaraswamy and A.Kameswara Rao, Charitor Publications
6. Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011.

Reference Text books:

1. Various related updated & recent standards of BIS, IRC, ASTM, RILEM, AASHTO, etc. corresponding to materials used for Civil Engineering applications
2. An Introduction to Geotechnical Engineering, by Holtz R.D. and Kovacs, W.D., Prentice Hall, NJ
3. K Subramanya, Water Resources Engineering through Objective Questions, Tata Mc-Graw Hill.
4. Introduction to Environmental Engineering and Science by Gilbert Masters, Prentice Hall, New Jersey.

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Identifying the various areas available to pursue and specialize within the overall field of Civil Engineering.	L3
2. Showcasing the many monuments, heritage structures, nationally important infrastructure, and impressive projects to serve as sources of inspiration.	L1
3. Highlighting the depth of engagement possible within each of these areas.	L3
4. Providing a foundation for the student to launch off upon an inspired academic pursuit into this branch of engineering.	L3

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A16GT.1						3			2			1	1	2	
19A16GT.2						3			2			1	1	2	
19A16GT.3						3			2			1	1	2	
19A16GT.4						3			2			1	1	2	

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course: Water Resources and Conservation
Category : OE
Course Code : 19A16HT
Year : III B. Tech
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives:

- To impart knowledge about the planning and management of water resources.
- To introduce the concepts of watershed management, integrated water resources management, environmental interaction of water resources and policies/framework related to water resources.
- To enable the students to understand the different components of water resources and water conservation techniques.

Unit 1 : (8hrs)

Historical profile on world water resources development; Global water resources, Hydrologic cycle, Watershed zoning, Interrelation of water resources with other natural resources and the environment, Water quantity and water budget, Water allocation and water scheduling; Water resources availability and demand.

Unit 2 : (10hrs)

Hydrologic Processes – evaporation, transpiration and precipitation; Water quality parameters, Water pollution – causes, effects and measures; Rainfall-Runoff analysis, Floods measurement, frequency analysis, design of peak flood and routing, Reservoir operation and design.

Unit 3 : (10hrs)

Water resource planning – concept, preliminary study, feasibility study, detailed planning, Design of water distribution system, Irrigation scheduling and techniques;
Water use sectors – Domestic, Industries and Agriculture, Sustainable water resources development, Integrated Water Resources Management (IWRM), Socio-economic aspects of water resources management, Rainwater Harvesting Watershed management.

Unit 4 : (9hrs)

Global Efforts on Water conservation, Think Globally Act Locally on water resources, Local water organizations, National Water Policy, World water organizations - WUGs, WUAs, UN, WWP, WWC, etc. Environmental discourse on dam Construction.

Unit 5 : (8hrs)

Water conservation Techniques: Protection of Water from Pollution, Redistribution of Water, Rational Use of Groundwater, Renovation of Traditional Water Sources, Use of Modern Irrigation Methods, Increasing Forest Cover, Change in Crop Pattern, Flood Management, Conserving Water in Industries, Conservation of water by Municipal authorities, Use rainwater effectively, Make effective use of soil water reserves, Take measures to avoid run off, Avoid wasting water through evaporation, Reduce water losses through drainage, Plan your irrigation, Contour Farming& Contour Ploughing

Prescribed Text Books:

1. Global Water Partnership (GWP), Integrated Water Resources Management, Background

Department of Computer Science and Engineering

Papers No. 4, Technical Advisory Committee (TAC)..

2. Water Resources Systems Planning and Management, Vol. 51 by Jain, S.K. and V.P. Singh, Elsevier Science
3. Hierarchical Analyses of Water Resources Systems: Modeling and Optimization of Largescale systems by Haimes, McGraw-Hill, New York.
4. Water Resources Systems Planning and Management by Loucks D.P. and van Beek E., UNESCO Publishing, The Netherlands.

Reference Text books:

1. Water Resources Systems Planning and Analysis by Loucks, D.P., J.R. Stedinger, and D.A. Haith, Prentice-Hall, N.J.
2. Hydrosystems Engineering and Management by Mays, L.W. and K. Tung, McGraw-Hill Inc., New York.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 1. Identify different problems related to water resources planning, management and development. | L3 |
| 2. Describe problems like water balance, rainfall-runoff analysis, water distribution networks, flood routing, irrigation scheduling, water pollution and other water related concerns | L2 |
| 3. Apply principles and guidelines to solve above mentioned problems. | L4 |
| 4. Understand different water conservation techniques, in order to save water for future | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A16HT.1						2	3		2				1		3
19A16HT.2						2	3		2				1		3
19A16HT.3						2	3		2				1		3
19A16HT.4						2	3		2						3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Energy Management and Conservation
Category : OE2
Course Code : 19A26GT
Year : III B. Tech
Semester : II Semester (Common to CE, ME & CSE)

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	-	3

Course objective:

- To impart basic knowledge to the students about current energy scenario, energy conservation and management.
- To inculcate among the students systematic knowledge and skill about assessing the energy efficiency and energy management.

Unit-I Principles of energy management

Organizing an energy management program – Initiating and managing an energy management program - Planning - Leading – Controlling – Promoting – Monitoring and reporting.

Unit-II Electrical energy management

Energy efficient motors – Power factor improvement – Lighting and lighting system control – Energy saving opportunities.

Qualities and functions of energy managers – Qualities and functions of an energy manager – questionnaire -Check list for top management.

Unit-III Energy Scenario

6

Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, energy needs of growing economy, long term energy scenario, energy sector reforms, energy and environment, energy conservation and its importance, energy efficiency and its need, restructuring of the energy supply sector, energy strategy for the future, air pollution, climate change.

Unit-IV Energy Conservation

Principles of Energy Conservation. Energy Conservation Act 2001 and its feature, Electricity Act -2003 and features, The Energy Conservation (Amendment)Act,2010 and its importance. Prominent organizations at Centre and state level responsible for its implementation. Energy Consumption pattern, Resource availability, Energy pricing, Energy Security.

Unit-V Basics of Energy, pricing and its uses in buildings

Electricity tariff, load management and maximum demand control, power factor Improvement, selection & location of capacitors.

Estimation of Energy use in buildings: Estimation of Energy use in a building, Heat gain and Thermal Performance of building envelope- steady and Non-Steady heat transfer through the glazed window and the wall-standard for thermal performance of building envelope, Evaluation of the overall Thermal Transfer.

TextBooks:

1. "Energy Management" - W.R.Murphy&G.MckeyButterworths.
2. "Energy Management Hand Book" - W.C.Turner, John Wiley and Sons.

3. "Energy Management Principles" – Craig B Smith – Pergamon press
4. "Energy Conservation" - Pa ulO'Callagan - Pergamon press.
5. S.C. Tripathy, "Utilization of Electrical Energy and Conservation", McGraw Hill, 1991

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|--------------------------------------------------------------------------------------------------------------------|--------|
| 1.To understand the Principles and organization of energy management | L2 &L4 |
| 2.To acquaintance with electrical energy management like energy saving opportunities and Power factor improvement. | L3 |
| 3.Analyze the current energy scenario and its importance in energy conservation | L4 |
| 4.Understand the concepts of Energy conservation and its features. | L2 |
| 5.Understand the estimation of Energy use in buildings. | L2 |

COs-POs-PSOs Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
19A26GT.1	3	3	-	-	-	2	3	-	-	-	-	3
19A26GT.2	3	3	-	-	-	3	3	-	-	-	-	3
19A26GT.3	3	3	-	-	-	2	2	2	-	-	-	3
19A26GT.4	3	3	-	-	-	2	2	2	-	-	-	2
19A26GT.5	3	3	-	-	-	2	2	2	-	-	-	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES RAJAMPET
(AN AUTONOMOUS INSTITUTION)

Title of the course : Fuzzy Logic and Neural Network
 Category : OE
 Course code : 19A26HT
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical Hours	Credits
3	-	-	3

Course Objectives

- To understand the fundamental concepts of Artificial Neural network
- To Understand the concepts of different types Neural network architectures and training algorithms
- To understand the concepts of classical sets Fuzzy sets
- To understand the concepts Fuzzy logic controllers
- To gain knowledge in neuro- fuzzy control and its applications in power systems

Unit 1: Introduction to Artificial Neural Networks 12
 Introduction, Biological Neuron, Biological Artificial Neuron model , Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of neural networks , Historical developments, Neural network architectures, McCulloch-Pitts Model, Types of neuron activation functions, Learning methods(supervised, unsupervised, Reinforcement), Applications of Neural Networks.

Unit-2: Single layer and multi-layer feed forward neural networks 12
 Perceptron Models: Discrete, Continuous (concepts only), Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications, ADALINE, MADALINE, Back Propagation Network, BP Learning Rule, Input Layer, Hidden Layer and output Layer computations, Radial Basis function network, Hetero associative memory neural and Auto associative memory net, applications.

Unit-3 Classical and Fuzzy sets 08
 Introduction to classical sets, Fuzzy sets – Properties, Operations and Relations, Membership, Uncertainty, Fuzzy Relations, Cardinalities and Membership Functions.

Unit-4 Fuzzy Logic system and components 10
 Fuzzification, Membership Value assignment, Development of Rule Base, Defuzzification to crisp sets, Defuzzification methods

Unit 5 Neural network and fuzzy logic applications to Power system 10
 ANN Based Short Term Load Forecasting, Load Flow Studies, Fault diagnosis and Fuzzy Logic based Unit Commitment and load frequency control.

Text Books:

1. S.N.Sivanadam, S.N.Deepa *Principles of Soft Computing Techniques* , Wiley India publication.
2. JacekM.Zurada *Introduction to Artificial Neural Systems*, Jaico Publishing House, 1997.

Reference Books:

1. N. Yadaiah and S. BapiRaju, *Neural and Fuzzy Systems: Foundation, Architectures and Applications*, Pearson Education
2. James A Freeman and Davis S kapura, *Neural Networks* ,Pearson, 2002
3. BrokKosko, *Neural Networks and Fuzzy Logic System* , , PHI Publications

4. Rajasekharan and Rai, *Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications* - PHI Publication.

Course Outcomes: By the end of this course, students will be able to

1. Able to analyze and form Neural Networks For Different Problems
2. Able to Get the knowledge of Different Types of Neural Networks
3. Understand fuzzy concepts and fuzzy logic components
4. Able to apply Neural Networks for Electrical Systems.
5. Able to apply Fuzzy Logic for Electrical Systems

COs-POs-PSOs Mapping

Course Outcomes	Program Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
19A26HT .1	1	1	1	1	1	-	-	-	1	1	1	1
19A26HT .2	2	3	2	2	3	-	-	-	2	2	2	2
19A26HT .3	-	2	-	-	-	-	-	-	-	-	2	-
19A26HT .4	-	-	-	3	-	-	-	-	-	-	-	3
19A26HT .5	2	3	2	2	2	-	-	-	2	2	2	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Introduction to Mechatronics
 Category : OEC
 Course Code : 19A36ET
 Year : III Year
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	0	3

Course Objectives: This course will

- Familiarize the technologies behind modern mechatronic systems.
- Explain fundamentals for the development of fully automated system.
- Develop a robotic or automated systems focusing on the hardware and software integration.
- Demonstrate the development of mechatronic system and MEMS.

Unit 1 Introduction 09
 Definition of Mechatronics, Need for Mechatronics in Industry, Objectives of mechatronics, mechatronics design process, Mechatronics key elements, mechatronics applications–Computer numerical control(CNC) machines, Tool monitoring systems, Flexible manufacturing system(FMS), Industrial Robots, Automatic packaging systems, Automatic inspection systems.

Unit 2 : Signal Conditioning 09
 Introduction, hardware digital I/O, analog input – ADC resolution, speed channels filtering noise using passive components – resistors, capacitors – amplifying signals using OP amps – software – digital signal processing – low pass, high pass, notch filtering.

Unit 3 Sensors & Actuators 09
 Sensors: Static characteristics & sensors, displacement, position and proximity sensors. Force and torque sensors, pressure sensors, flow sensors, temperature sensors, acceleration sensors, level sensors, selection criteria for sensors.
 Actuators: Mechanical, electrical, hydraulic & pneumatic actuation systems characteristics and their limitations. Design of hydraulic & pneumatic circuits.

Unit 4 Microprocessors, Micro controllers and Programmable Logic Controllers 09
 Architecture of of Microprocessor, Micro controller and Programmable Logic Controller, PLC Programming using ladder diagrams, logics, latching, sequencing, timers relays and counters, data handling, Analog input/output, selection of controllers.

Unit 5 Micro Electro Mechanical Systems(MEMS) 09
 History, Effect of scaling, Fabrication Techniques: Oxidation, Physical Vapor disposition, Chemical Vapor Deposition, Lithography, Etching, Wafer bonding, LIGA, DRIE, and Applications: Labon chip.

Prescribed Text Books:

1. Mechatronics Electronics Control Systems in Mechanical and Electrical Engineering, WBolton, 3/e Pearson Education Press, 2018. ISBN: 9781292250977
2. Devadas Shetty and Richard A Kolk, Mechatronic System Design, 2/e, Cengage learning, 2010. ISBN: ISBN-13 : 978-1439061985
3. Clarence W. de Silva, Mechatronics an Integrated Approach, CRC Press, 2005. ISBN: 0203611640, 9780203611647

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Fundamentals of Robotics
 Category : OEC
 Course Code : 19A36FT
 Year : III Year
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	-	3

Course Objectives:

- To acquire the knowledge on Robotics and its performance
- To develop the ability of kinematics and dynamics of Robots
- To acquire the knowledge on trajectory planning and manipulator
- To develop the ability on various sensor integration on robot
- To develop the ability to use the programming and tools for operation of robot

<p>Unit 1 Introduction to Robotics Types and components of a robot, Classification of robots - Robotics, Robots-Anatomy, Structure and classification, Robot performance parameters – resolution, accuracy and repeatability, Arm and wrist configuration - Social issues and safety</p> <p>Unit 2 Robot Kinematics and Dynamics Description of links and joints, Kinematic modeling of manipulator, Translation and Rotation Representation, Coordinate transformation, Denavit - Hartenberg (DH) notation, Examples of DH notation, Jacobian, Singularity, and Statics.</p> <p>Unit 3 Trajectory Planning and Manipulator Control Terminology, Steps in trajectory planning, Joint space techniques, path description, Use of polynomials as interpolating function, various trajectories, Introduction to Cartesian space techniques.</p> <p>Unit 4 End effectors, sensors and vision system Tools as end effectors, Robot Grippers - Types of Grippers, Design aspect for gripper, Force analysis for various basic gripper system. Sensors for Robots - Characteristics of sensing devices, Classification, applications and selection of sensors. Robotic vision system, image acquisition, spatial and amplitude digitization, image processing and analysis.</p> <p>Unit 5 Robot programming and applications Robot applications in material handling, machine loading/unloading, assembly, inspection and processing. Robot Programming – Methods, Lead through methods, Robot Programming-Language overview, commands for elementary operations</p>	<p>11</p> <p>11</p> <p>08</p> <p>08</p> <p>10</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------

Prescribed Text Books:

1. Saha, S.K., "Introduction to Robotics, 2nd Edition, McGraw-Hill Higher Education, New Delhi, 2014. , ISBN – 0070140014
2. Ghosal, A., "Robotics", Oxford, New Delhi, 2006. ISBN – 9780195673913
3. Niku Saeed B., "Introduction to Robotics: Analysis, Systems, Applications", PHI, New Delhi. 2001. ISBN – 0130613096

Reference Books:

1. Tsuneo Yoshikawa, Foundations of Robotics, MIT Press. Roy. 2010. ISBN - 0262514583
2. Mittal R.K. and Nagrath I.J., "Robotics and Control", Tata McGraw Hill. 2017, ISBN - 9780070482937
3. Mukherjee S., "Robotics and Automation", Khanna Publishing House, Delhi. 2017. 2017, ISBN – 9386173751

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-----------------------------------------------------------------------------------------------------------------------------|----|
| 1. Understand the concept of Robots, Structure and its specifications. | L2 |
| 2. Solve robot forward and inverse kinematic problems. | L5 |
| 3. Carry out trajectory planning and joint modeling for the simple robotic system. | L4 |
| 4. Identify appropriate end effectors and sensors for particular application | L4 |
| 5. Execute various steps robot programming and Knowledge will be gained on application of Robotics used in various sectors. | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A36FT.1	3	3	3	-	-	3	3	3	-	-	-	-	-	-	-
19A36FT.2	2	2	2	-	-	2	-	2	-	-	-	-	-	-	-
19A36FT.3	1	1	1	-	-	-	-	1	-	-	-	-	-	-	-
19A36FT.4	1	1	1	-	-	-	-	1	-	-	-	-	-	-	-
19A36FT.5	2	-	2	-	-	2	-	2	-	2	-	-	-	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Non-conventional sources of energy
 Category : OEC
 Course Code : 19A36GT
 Year : III Year
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	0	3

Course Objectives:

- To grasp the role and potential of new and renewable source
- To recognize the principle, storage and applications of solar energy
- To understand the sources and potentials of wind energy and also to comprehend the Principles of Bio-Conversion of bio-mass and bio-gas uses.
- To explain the principle, working procedure and types of geothermal energy, ocean energy and tidal & wave energy.
- To know the knowledge on direct energy conversion.

Unit 1 Principles Of Solar Radiation 09

Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation , potential in India

Unit 2 Solar Energy Collectors 09

Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors. Solar Energy Storage And Applications: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion, potential in India.

Unit 3 Wind Energy 08

Sources and potential in India, horizontal and vertical axis wind mills, performance characteristics, Betz criteria. Bio-Mass: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, and economic aspects, potential in India

Unit 4 Geothermal Energy 08

Resources, types of wells, methods of harnessing the energy, potential in India.
 Ocean Energy: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics, potential in India.

Unit 5 Direct Energy Conversion 09

Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, Seebeck, Peltier and Joule Thomson effects, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions

Prescribed Text Books:

1. Tiwari and MK.Ghosal, Renewable energy resources: Basic principles and applications, Narosa publications 2005, ISBN 10: 1842651250 ISBN 13: 9781842651254
2. G.D. Rai, Non-Conventional Energy Sources, khanna publications, 2011, ISBN 10: 8174090738, ISBN 13: 9788174090737

Reference Books:

1. Twidell& Weir, Renewable Energy Sources, Routledge , 3rd Ed.2015,ISBN 9780367200756
2. Non Conventional Energy Resources, B.H.Khan, McGrawHill, 2015, ISBN 1259081397, 9781259081392

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Create awareness on role and potential of new and renewable source and basics of solar energy.	L2
2. acquire the knowledge on different types of collectors and storage systems of solar energy and their applications.	L2
3. Able to achieve sufficient knowledge on Wind energy and Bio-mass energy.	L2
4. Familiarize the student with the Geothermal and Ocean energy concepts and their potentiality	L2
5. Gain the knowledge on direct energy conversion	L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A37ET.1	3	2	-	-	-	3	3	-	-	-	-	3	-	-	-
19A37ET.2	3	3	-	1	3	3	-	-	-	-	-	3	-	-	-
19A37ET.3	3	2	3	-	-	3	3	-	-	-	-	3	-	-	-
19A37ET.4	3	3	-	-	3	3	-	-	-	-	-	3	-	-	-
19A37ET.5	3	3	-	-	3	3	-	-	-	-	-	3	-	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Electronic Circuits and its Applications
 Category : OE
 Course Code : 19A46GT
 Year : III B.Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: The course aims to provide the student with the ability

- To analyze and design the transistor and feedback amplifiers.
- To understand and analyze the concepts of oscillators, linear and nonlinear wave shaping circuits.

Unit 1 : SMALL SIGNAL ANALYSIS OF AMPLIFIERS 14
 Introduction to h-parameter model, Small Signal model of BJT, Analysis of CB, CE and CC configurations using h-parameters – simplified hybrid model – miller’s theorem – dual of miller’s theorem. Analysis of Cascaded Transistor Amplifiers- RC Coupled amplifier, Frequency response of RC Coupled, Direct coupled and Transformer coupled amplifiers.

Unit 2 : FEEDBACK AMPLIFIERS 14
 Concept of Feedback, Classification of feedback amplifiers, Transfer Gain with feedback, General characteristics of negative feedback amplifiers. Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components (Topologies).

Unit 3 : OSCILLATORS 10
 Condition for oscillations. Oscillator Types, Frequency and amplitude stability of oscillators, LC oscillators-Hartley and Colpitts oscillators, RC-phase shift and Wien bridge oscillators, Crystal Oscillators

Unit 4 : LARGE SIGNAL AMPLIFIERS 9
 Classifications, Class A power Amplifiers- Direct coupled and Transformer Coupled, Class B power Amplifiers- Push-pull and Complementary Symmetry-Transistor power dissipation, Power and Efficiency calculations.

Unit 5 : LINEAR AND NON LINEAR WAVE SHAPING 12
 High pass & low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and Exponential inputs. Diode and Transistor clippers and clampers, clamping circuit theorem.

Prescribed Text Books:

1. J. Millman and Christos C. Halkias- “Integrated Electronics”, Mc Graw-Hill, 1972.
2. Robert T. Paynter- “Introductory Electronic Devices and Circuits”, Pearson Education, 7th Edition.
3. J. Millman and H. Taub, “Pulse, Digital and Switching Waveforms”, McGraw-Hill, second edition, 2007.

Reference Text books:

1. Robert L. Boylestad and Louis Nashelsky - “Electronic Devices and Circuits Theory”, Pearson/Prentice Hall, 9th Edition, 2006.
2. Donald A. Neumann- “Electronic Circuit Analysis and Design”, Mc Graw Hill.
3. Anand Kumar, “Pulse and Digital Circuits”, PHI, 2005.Second Edition.

Department of Computer Science and Engineering

Course Outcomes:

Upon completion of the course, student can

Blooms Level of Learning

- | | |
|------------------------------------------------------------------------------------|----|
| 1. Analyze the single stage amplifiers using h-parameter model at low frequencies. | L4 |
| 2. Understand the feedback amplifiers and oscillators. | L2 |
| 3. Analyze the concepts of large signal amplifiers. | L4 |
| 4. Design and analyze linear and nonlinear wave shaping circuits. | L6 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A46GT.1	3	3	2	3	3	1	-	-	2	-	-	-	2	3	-
19A46GT.2	1	3	3	2	2	-	-	-	2	-	-	-	3	-	-
19A46GT.3	3	3	3	2	2	1	-	-	2	-	-	-	2	3	-
19A46GT.4	2	2	2	-	-	-	-	-	2	-	-	-	2	3	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : BASICS OF COMMUNICATION SYSTEMS
 Category : OE
 Course Code : 19A46HT
 Year : III B.Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Design simple systems for generating and demodulating AM, DSB, SSB and VSB signals.
- Understand the concepts in Angle modulation for the design of communication systems.
- Design simple systems for generating and demodulating frequency modulated signals.
- Learn the concepts of random process and various types of noise.
- Analyze pulse modulation and sampling techniques.

Unit 1 : AMPLITUDE MODULATION 10

AMPLITUDE MODULATION: Introduction, Amplitude Modulation: Time & Frequency – Domain description, Switching modulator, Envelop detector. DOUBLE SIDE BAND-SUPPRESSED CARRIER MODULATION: Time and Frequency – Domain description, Ring modulator, Coherent detection, Costas Receiver, Quadrature Carrier Multiplexing.

SINGLE SIDE-BAND AND VESTIGIAL SIDEBAND METHODS OF MODULATION: SSB Modulation, VSB Modulation, Frequency Translation, Frequency- Division Multiplexing, Theme Example: VSB Transmission of Analog and Digital Television

Unit 2 : ANGLE MODULATION 10

ANGLE MODULATION: Basic definitions, Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals, Generation of FM Signals, Demodulation of FM Signals, FM Stereo Multiplexing, Phase-Locked Loop: Nonlinear model of PLL, Linear model of PLL, Nonlinear Effects in FM Systems. The Super heterodyne Receiver

Unit 3 : RANDOM VARIABLES & PROCESS 10

RANDOM VARIABLES & PROCESS: Introduction, Probability, Conditional Probability, Random variables, Several Random Variables. Statistical Averages: Function of a random variable, Moments, Random Processes, Mean, Correlation and Covariance function: Properties of autocorrelation function, Cross-correlation functions.

NOISE: Shot Noise, Thermal noise, White Noise, Noise Equivalent Bandwidth

Unit 4 : NOISE IN ANALOG MODULATION 10

NOISE IN ANALOG MODULATION: Introduction, Receiver Model, Noise in DSB-SC receivers, Noise in AM receivers, Threshold effect, Noise in FM receivers, Capture effect, FM threshold effect, FM threshold reduction, Pre-emphasis and De-emphasis in FM

Unit 5 : DIGITAL REPRESENTATION OF ANALOG SIGNALS 10

DIGITAL REPRESENTATION OF ANALOG SIGNALS: Introduction, Why Digitize Analog Sources?, The Sampling process, Pulse Amplitude Modulation, Time Division Multiplexing, Pulse-Position Modulation, Generation of PPM Waves, Detection of PPM Waves, The Quantization Process, Quantization Noise, Pulse- Code Modulation: Sampling, Quantization, Encoding, Regeneration, Decoding, Filtering, Multiplexing , Application to Vocoder

Prescribed Text Books:

1. Communication Systems, Simon Haykins & Moher, 5th Edition, John Wiley, India Pvt. Ltd, 2010,

Reference Text books:

1. Modern Digital and Analog Communication Systems, B. P. Lathi, Oxford University Press., 4th edition.
2. An Introduction to Analog and Digital Communication, Simon Haykins, John Wiley India Pvt. Ltd., 2008,
3. Principles of Communication Systems, H.Taub & D.L.Schilling, TMH, 2011.
4. Communication Systems, Harold P.E, Stern Samy and A.Mahmond, Pearson Edition, 2004.
5. Communication Systems: Analog and Digital, R.P.Singh and S.Sapre: TMH 2nd edition, 2007.

Course Outcomes:

Student will be able to

1. Determine the performance of analog modulation schemes in time and frequency domains.
2. Determine the performance of systems for generation and detection of modulated analog signals.
3. Characterize analog signals in time domain as random processes and in frequency domain using Fourier transforms.
4. Characterize the influence of channel on analog modulated signals
5. Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems.

Blooms Level of Learning

L4
L4
L3
L3
L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
19A46HT.1	3	1	-	-	-	1	-	-	-	3	-	2	3	2
19A46HT.2	3	3	1	-	-	1	-	-	-	2	-	2	3	2
19A46HT.3	2	3	-	1	-	2	-	-	-	2	-	2	3	2
19A46HT.4	2	1	3	-	-	2	-	-	-	2	-	2	3	2
19A46HT.5	3	3	1	-	-	1	-	-	-	2	-	2	3	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Microprocessor & Interfacing and Compiler Design Lab
 Category : ES
 Course Code : 19A461L
 Year : III B. Tech.
 Semester : II Semester

Lecture Hours : 0 Tutorial Hours : 0 Practical : 3 Credits : 1.5

MICROPROCESSOR & INTERFACING LAB

Course Objectives: This course will able

- To learn Assembly Languageprogramming.
- To understand programmable peripheral devices and theirInterfacing.

Experiment No. 1 :- Arithmeticoperations.

Experiment No. 2 :- Signed Arithmeticoperations.

Experiment No. 3 :- ASCII – Arithmeticoperations.

Experiment No. 4 :- Identify the parity (even/Odd) of a givenbyte/word.

Experiment No. 5 :- String Operations

- a. Relocate a string of Nwords/bytes.
- b. ReverseString.
- c. Length of theString
- d. StringInsertion
- e. StringDeletion
- f. Scanning a byte/ word.

Experiment No. 6 :- Interfacing with 8255 PPI

- a. DACInterfacing:
 - i. PWM generation in BSRmode
 - ii. Triangular, sinusoidal and square wave generation in I/Omode.
- b. Stepper Motor Interfacing: Rotation in Clock wise and Anti-clock wisedirection.

Course Outcomes:

Student will be

Blooms Level of Learning

- | | |
|-----------------------------------------------------------------------------|----|
| 1. Able to write Assembly Languageprograms. | L6 |
| 2. Able to understand the operations and applications ofmicroprocessors | L2 |
| 3. Able to understand programmable peripheral devices and their Interfacing | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A461L.1	3	-	-	-	2	2	-	-	1	-	-	-	1	-	-
19A451L.2	2	3	-	-	3	-	-	-	-	-	-	-	1	-	-
19A451L.3	3	-	-	-	-	-	-	-	-	-	-	1	1	-	1

Compiler Design Lab

Course Objectives: This course will able to

10. Explain the importance of compiler design.
 - Design and implementation of lexical analyzer using Lex tools.
 - Design compiler components.
 - Enlighten the student with knowledge base in compiler design and its applications.

Week1 :

Construct a Lexical Analyzer for validating identifiers, operators, comments, looping statements, key words.

Week2 :

Write a program to compute FIRST and FOLLOW sets.

Week3:

Write a program to construct a Recursive Parser.

Week4:

Write a program to construct a Recursive Descent Parser.

Week5:

Write a program to remove left factoring.

Week6:

Write a program to remove left recursion

Text Books:

1. Principles of compiler design -A.V. Aho. J.D.Ullman; Pearson Education.
2. Lex&yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-----------------------------------------------------------------------------------------------------------|--------|
| 1. Understand and define the role of lexical analyzer, use of regular expression and transition diagrams. | L1, L3 |
| 2. Understand and use Context free grammar, and parse tree construction. | L1, L3 |
| 3. Develop program for solving parser problems. | L3 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A461L.1	-	-	3	-	3	-	-	-	-	3	3	-	3	-	-
19A461L.2	-	-	3	-	3	-	-	-	3	3	3	-	3	3	3
19A461L.3	-	-	3	-	3	-	-	-	3	-	3	3	3	-	3
19A461L.4	-	-	3	-	3	-	-	-	3	-	-	3	3	3	3
19A461L.5	-	-	3	-	3	-	-	-	-	3	-	3	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Mobile Application Development Lab
Category : PC
Course Code : 19A563L
Year : III B. Tech.
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
0	0	2	1

Course Objectives: This course will able to

- Understand develop Applications in android environment
- Develop user interface applications
- Develop data persistence, messaging, location based services.

Week1 :

Step by step installation of Android studio and understanding the development environment

Week2 :

- a) Create an Android application that shows Hello + name of the user and run it on an emulator.
- b) Create an application that takes the name from a text box and shows helloMessage along with the name entered in text box, when the user clicks the OK button.

Week3:

Create an application that has as button, when the user clicks the button it should display second activity which has edit text and an OK button. When user writes something on the edit text and clicks the OK button it should go back to first activity and display content of edit text in the form of toast.

Week4:

Create a screen that has input boxes for User Name, Password, and Address, Gender (radio buttons for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a submit button. On clicking the submit button, print all the data below the Submit Button. Use (a) Linear Layout (b) Relative Layout and (c) Grid Layout or Table Layout.

Week5:

Develop an application that shows names as a list and on selecting a name it should show the details of the candidate on the next screen with a "Back" button. If the screen is rotated to landscape mode (width greater than height), then the screen should show list on left fragment and details on right fragment instead of second screen with back button. Use Fragment transactions and Rotation event listener.

Week6:

Develop an application that uses a menu with 3 options for dialing a number, opening a website and to send an SMS. On selecting an option, the appropriate action should be invoked using intents.

Week7:

Develop an application that inserts some notifications into Notification area

Week8:

Create an application to display images in gallery and Image Views.

Create an application to display analog and digital clock.

Week9:

Create an application that saves user information like name, age, gender etc. in shared preference and retrieves them when the program restarts.

Week10:

- a) Create an application that illustrates SMS messaging
- b) Create an application that illustrates sending E-mail.

Week11:

Develop an application that shows the current location's latitude and longitude continuously as the device is moving (tracking)

Prescribed Text Books:

1. Beginning Android programming with android studio 4th edition, J. F. DiMarzio, Published by John Wiley & Sons, Inc.

Reference Text Books:

1. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012

Course Outcomes:

Student will be able to

- | | |
|---------------------------------------------------------------------------|--------------------------|
| | Blooms Level of Learning |
| 1. acquire practical knowledge on Android programming | L1, L2 |
| 2. Understand the implementation aspects of user interfaces. | L3 |
| 3. Apply of image view and persistent data services. | L4 |
| 4. Implement the messaging services in applications | L5 |
| 5. Deploy and implement the location based services in their applications | L5, L6 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A563L.1	3	-	3	-	3	-	-	-	-	-	-	-	3	-	-
19A563L.2	3	-	3	-	3	3	-	-	3	-	3	-	3	-	-
19A563L.3	3	-	3	-	3	3	-	-	3	-	3	-	3	-	3
19A563L.4	3	-	3	-	3	3	-	-	3	-	-	-	3	2	3
19A563L.5	3	-	3	-	3	-	-	-	-	-	-	-	3	2	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Professional Communication Skills Lab
 Category : BS
 Course Code : 19AC62L
 Year : III B. Tech.
 Semester : II Semester
 Branch : CE, ME, CSE

Lecture Hours - Tutorial Hours - Practical 3 Credits 1.5

Résumé Preparation – structure, formats and styles – planning - defining career objective - projecting one’s strengths and skills - creative self-marketing–sample resumes - cover letter

Interview Skills- concept and process - pre-interview planning – preparation - body language - answering strategies – frequently asked questions

Group Discussion –communicating views and opinions – discussing – intervening – agreeing and disagreeing –asking for and giving clarification - substantiating - providing solution on any given topic across a cross-section of individuals - modulation of voice and clarity - body language – case study

Oral Presentations (Individual& Team) – collection of data from various sources –planning, preparation and practice – attention-gathering strategies - transitions – handling questions from audience

Listening Comprehension – listening for understanding - responding relevantly

Learning Resources: AECS Lab Manual prepared by Dept of HS, AITS Rajampet

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. express himself/herself fluently in social and professional contexts	L4
2. demonstrate effective presentation skills	L4
3. face interviews confidently	L3
4. participate in meetings effectively	L4
5. listen actively for better understanding	L4

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19AC62L.1										3		3			
19AC62L.2										3		3			
19AC62L.3										3		3			
19AC62L.4										3		3			
19AC62L.5										3		3			

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Advanced Web Programming
 Category : PC
 Course Code : 19A571T
 Year : IV B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
2	0	0	2

Course Objectives: This course will able to

- Know the working of different servers like XAMPP, WAMP and basics of PHP environment.
- Understand the basics and object oriented fundamentals of PHP.
- Apply gained knowledge of PHP for creating applications in client/server environment using PHP.
- Analyze different web based applications with PHP and database environment.
- Apply concepts of AJAX in web applications developed in PHP and MySQL.

Unit 1 : *Introduction to Web Technologies* 8
 Introduction to Web servers like XAMPP (Bundle Server), WAMP (Bundle Server), Handling HTTP Request and Response, installations of above servers.
 INTRODUCTION TO PHP: Downloading, installing, configuring PHP, Programming in a Web environment like XAMPP and WAMPP Bundle Servers. The anatomy of a PHP Page.

Unit 2 : OVERVIEW OF PHP DATA TYPES AND CONCEPTS: 10
 Variables and data types, Operators, Expressions and Statements, Strings, Arrays and Functions.
 OVERVIEW OF CLASSES, OBJECTS, AND INTERFACES: Creating instances using Constructors, Controlling access to class members, Extending classes, Abstract classes and methods, using interfaces, Using class destructors, File Handling and Using Exceptions

Unit 3 : PHP ADVANCED CONCEPTS: 10
 Using Cookies, Using HTTP Headers, Using Sessions, Authenticating users, Using Environment and Configuration variables
 CREATING AND USING FORMS: Understanding Common Form Issues, GET vs. POST, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.

Unit 4 : PHP AND DATABASE ACCESS: 10
 Basic Database Concepts, Connecting to a MYSQL database, Retrieving and Displaying results, Modifying, Updating and Deleting data. MVC architecture.
 Introducing PDO: Using PDO, Installing PDO, PDO's database support, Connecting to a DB server and selecting a database, Getting and setting attributes, Error Handling, Query Execution, Prepared statements, Retrieving data.

Unit 5 : INTRODUCTION To AJAXs 8
 Introducing Ajax -From CGI to Flash to DHTML, Pros and Cons of Today's Web Application Environment, Enter Ajax, Ajax Requirements, Ajax Basics-HTTP Request and Response Fundamentals, The XMLHttpRequestObject, XMLHttpRequest Methods, XMLHttpRequest Properties, Cross-Browser Usage, Sending a Request to the Server, Ajax examples on Form validation and Database Operations.

Prescribed Text books:

1. Jason Gilmore .Beginning PHP and MySQL, Apress Publications (Dream tech.). 3rd edition.
2. Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens .PHP 5 Recipes A problem Solution Approach.
3. Lee Babin Beginning Ajax with PHP From Novice to Professional, Apress Publications (Dream tech.). 3rd edition

Reference Text Books:

1. J.Lee and B.Ware .Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, (Addison Wesley) Pearson Education.
2. Julie Meloni and Matt Telles, PHP 6 Fast and Easy Web Development, Cengage Learning Publications.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1. Use PHP environment in different types of web servers (XAMPP, WAMP) | L3 |
| 2. Learn the basics and object oriented concepts of PHP. | L1, L3 |
| 3. Use PHP concepts in development of client/server environment application. | L1, L3 |
| 4. Analyze their understanding of PHP and MySQL to create, modify, add, and delete data in a database through a web page in web application. | L1, L4 |
| 5. Perceive the fundamentals of AJAX to create good, effective and customized websites using PHP & MySQL. | L3, L6 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A571T.1	-	-	-	-	3	-	-	-	3	-	-	3	3	-	-
19A571T.2	-	-	3	-	3	-	-	-	3	-	-	-	-	-	-
19A571T.3	-	-	-	-	3	-	1	-	3	-	-	-	3	-	2
19A571T.4	-	-	3	-	3	-	-	-	3	-	-	3	3	-	-
19A571T.5	1	-	3	-	3	-	-	-	3	-	-	3	3	-	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Internet of Things
 Category : PC
 Course Code : 19A572T
 Year : IV B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
2	0	0	2

Course Objectives: This course will able to

- Understand the terminology, technology and its applications of IoT.
- Know the concept of M2M (machine to machine) with necessary protocols.
- Memorize the software platforms which are used for developing the applications.
- Learn the concepts of python programming language which is used to develop the IoT projects.
- Know the hardware platforms which is necessary to develop the IoT applications.

Unit 1 : Introduction to Internet of Things 8
 Introduction to Internet of Things, History of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels & Deployment Templates, Applications of IoT.

Unit 2 : IoT and M2M & IoT Platforms Design Methodology 7
 IoT and M2M: Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT. IoT Platforms Design Methodology: Introduction, IoT Design Methodology.

Unit 3 : The Wireless Embedded Internet 8
 Introduction to 6LoWPAN, The 6LoWPAN Architecture, The Basic 6LoWPAN Format, Addressing MQ telemetry transport for sensor networks (MQTT-S), ZigBee compact application protocol, Contiki and uIPV6, Wireless RFID Infrastructure.

Unit 4 : IoT Systems-Logical Design Using Python 8
 Introduction, Installing Python, Python Data Types and Data Structures, Control Flow, Functions, Modules, Packages and File Handling.

Unit 5 : IoT Physical Devices and Endpoints 8
 What is an IoT Device, Exemplary Device: Raspberry Pi, About the Board, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python, Other IoT Devices

Prescribed Text Books:

1. Internet of Things, A Hands-On Approach, ArshdeepBahga, Vijay Madiseti, University Press, 2015.
2. 6LoWPAN: The WirelessEmbedded Internet, Zach Shelby and Carsten Bormann,Wiley publications, first edition,2009.(Unit III).

Reference Text books:

1. The Internet of Things Connecting Objects to the Web, HakimaChaouchi,Wiley publications,2010.
2. Designing the Internet of Things, Adrian McEwen, Hakim Cassimally, Wiley 2014.
3. Enterprise IoT, A Definitive Handbook by Naveen Balani.

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-------------------------------------------------------------------------------------------------|----|
| 1. Understand the vision of IoT from a global context. | L1 |
| 2. Identify the difference between IoT and M2M communication. | L3 |
| 3. Determine the usage of 6LoWPAN and select the appropriate network protocols for IoT project. | L4 |
| 4. Develop the IoT experiments with the help of Python programs. | L5 |
| 5. Design the IoT applications using Raspberry Pi kit. | L6 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A572T .1	-	-	-	3	3	3	2	2	-	-	-	2	3	-	3
19A572T .2	-	-			3	-	-	-	-	1	-	-	3	3	-
19A572T 3	-	-	3	3	3	-	-	-	-	-	-	-	3	3	3
19A572T 4	-	-	3	3	-	-	-	-	-	-	-	-	3	3	3
19A572T 5	2	2	3	3	3	3	-	-	-	-	-	-		-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Management Science
 Category : HS
 Course Code : 19A373T
 Year : IV B. Tech.
 Semester : I Semester (Common to CSE & ECE)

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	0	3

Course Objectives:

- To understand the basic concepts of management and organization structures, types, merits and demerits.
- To give a clear idea about the plant layout and methods of production and understand the basic concepts of marketing and product life cycle.
- To understand the function of HR manager & industrial relations.
- To understand the concepts of Financial Management. Understand the concepts of PERT, CPM and how to draw the network diagram.
- To understand the concepts of MIS, TQM, JIT etc. Understand the importance of ethics in an organization.

Unit 1 Management and Organization Structure 10
 Meaning, Nature, Importance Elements Of Management; Planning, Organizing, Staffing, Directing, Coordinating, Reporting, Budgeting- Systems Approach To Management Evolution Of Scientific Management, Modern Management. Principles Need Of Organization Structure- Types Of Organization Structure Line, Line And Staff, Functional And Matrix Organizations.

Unit 2 Operations Management & Marketing Management 10
 Plant Location And Layout Methods Of Production (Job, Batch And Mass Production) Objectives Of Inventory Management- Need For Inventory Control- Method Of Inventory Management: EOQ, ABC Analysis - Core Concepts Of Marketing. Need, Want, Demand, Product, Value, Satisfaction, Marketing Mix- Product, Price, Place, Promotion, Product Levels – Product Life Cycle, – Channels Of Distribution.

Unit 3 Human Resources Management (Hrm) 10
 Significance Of HRM, Basic Functions Of HR manager, HR planning Job evaluation and Recruitment Selection and Placement, Induction and Training. Performance Appraisal. Compensation. Industrial Relations.

Unit 4 Financial Management, Project Management (PERT/CPM): 10
 Objectives, Scope, Techniques Of Investment Analysis, Pay Back Period, Accounting Rate Of Return, And Working Capital Cost Of Capital. Sources Of Financing. Network Drawing - Program me Evaluation And Review Technique (PERT) – Critical Path Method (CPM) – Probability Of Completing the project within given time Project Crashing (Simple Problems).

Unit 5 Advances in Management Practices 10
 Basic Concepts And Overview Of Management Information System (MIS), Enterprise Resource Planning (ERP), Value Analysis, Just –In-Time (JIT), Total Quality Management (TQM) And Supply Chain Management. Overview Of Ethics-Nature And Objectives Of Ethics - Relationship Between Ethics And An Organization.

Prescribed Text Books:

1. Industrial Management by O.P.Khanna, 17 Edition, ISBN: 9788189928353, 9788189928353
2. Management Science by Aryasri, McGraw Hill Education India, ISBN: 9780070090279, 9780070090279
3. Manufacturing Organization and Management, 6th Edition, Pearson Education India, ISBN: 9788177582758, 9788177582758

Reference Books:

1. Stoner, Freeman, Gilbert, Management, Pearson Edu., 2005, 6th Ed. ISBN: 9788131707043, 8131707040
2. PanneerSelvam, Production and Operations Management. PHI, 2004. ISBN, 8120324528, 9788120324527

Course Outcomes:

Student will be able to

Blooms Level of Learning

1. Understand the basic concepts of management and organization. structures, types, merits and demerits L1
2. Give a clear idea about the plant layout and methods of production. Understand the basic concepts of marketing and product life cycle. L1
3. Understand the function of HR manager & industrial relations. L1
4. Understand the concepts of Financial Management. Understand the concepts of PERT, CPM and how to draw the network diagram. L3
5. Understand the concepts of MIS, TQM, JIT etc. and the importance of ethics in an organization L2

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A373T.1	3	3	3	-	3	-	-	-	3	-	3	-	2	-	-
19A373T.2	3	3	3	-	3	-	-	-	3	-	3	-	2	-	-
19A373T.3	3	3	3	-	-	-	-	-	3	-	3	-	2	-	-
19A373T.4	3	3	3	1	3	-	-	-	3	-	3	-	2	2	-
19A373T.5	-	3	3	-	3	1	1	-	3	1	3	-	2	2	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)

Title of the Course : Big Data
 Category : PE
 Course Code : 19A57AT
 Year : IV B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Impart Knowledge on Big Data storage, processing, querying and reporting.
- Study big data with Hadoop MapReduce framework
- Apply the tools and techniques of Big Data to improve performance, scalability and reliability of a business intelligence system.

Unit 1 : *Introduction To Big Data* 8
 What is Big Data?, Why Big Data Matter?, Big Data Sources, Evaluation of Big Data, The nuts and bolts of Big Data, Best Practices for Big data analytics.
 Meet Hadoop: Data Storage and Analysis, Comparison with Other Systems.

Unit 2 : 11
 MapReduce: Analyzing the Data with Hadoop, Scaling Out, Hadoop Streaming, Hadoop Distributed File system.
 Hadoop I/O: Data Integrity, Compression, Serialization, File-Based Data Structures.

Unit 3 : 8
 How MapReduce Works: Anatomy of a MapReduce Job Run, Failures, Shuffle and Sort, Task Execution.
 MapReduce Types and Formats: MapReduce Types, Input Formats, Output Formats.

Unit 4 : 9
 MapReduce Features: Counters, Sorting, Joins, Side Data Distribution, MapReduce Library Classes.
 Setting Up a Hadoop Cluster: Cluster Specification, Cluster Setup and Installation, SSH Configuration, Hadoop Configuration, Security, Benchmarking a Hadoop Cluster.

Unit 5 : *Tools for Big Data Pig and Hive* 9
 Pig: Installing and Running Pig, Comparison with Databases, Pig Latin, User defined functions, data processing operators, Pig in practice.
 Hive: Installing Hive, Running Hive, Comparison with Traditional Databases, HiveQL, Tables, Querying Data, User - Defined Functions.

Prescribed Text books:

1. Tom White, *"Hadoop: The Definitive Guide,"* Oreilly and Yahoo Press, 3rd Edition, 2012.
2. Frank J. Ohlhorst, *"Big Data Analytics: Turning Big Data into Big Money,"* Wiley Publication, December 2012.

Reference Text Books:

1. Kevin Roebuck, *"Big Data: High-Impact Strategies - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendors,"* Tebbo Publisher, 2011.
2. Alex Holmes, *"Hadoop in Practice,"* Manning Publications Publisher, 2012.

Course Outcomes:

On successful completion of this course the students will be able to:

Blooms Level of Learning

- | | |
|----------------------------------------------------------------------------------------------------|----|
| 1. Learn the basics of Big Data and its storage in hadoop compared with other data base system. | L1 |
| 2. Analyze the different types of data by using Mapreduce and HDFS framework | L4 |
| 3. Understand types and formats of mapreduce and anatomy of mapreduce job run. . | L2 |
| 4. Understand the features of mapreduce and understand the installation of hadoop in cluster mode. | L2 |
| 5. Analyze the data with hadoop related project Hive. | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A57AT.1	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-
19A57AT.2	3	3	3	-	-	3	-	-	-	-	-	3	3	3	3
19A57AT.3	3	3	3	3	-	3	-	-	-	-	-	3	3	3	3
19A57AT.4	3	3	3	3	2	-	-	-	-	-	-	3	3	-3	3
19A57AT.5	3	3	3	3	2	3	-	-	-	-	-	3	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Deep Learning
 Category : PE
 Course Code : 19A57BT
 Year : IV B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Recall the basic concepts of artificial neural networks and activation functions
- Remember machine learning basics and algorithms
- Understand the internal design of deep feedforward networks and learning
- Recognize Convolution and recurrent neural networks
- Illustrate the networks in different applications

Unit 1 : 8
 Basics of artificial neural networks: characteristics of neural networks, Historical development, terminology, model of neuron, topology, basic learning laws
 Activation and Synaptic Dynamics: Activation, synaptic dynamic models, learning methods, stability and convergence

Unit 2 : 8
 Machine Learning Basics: learning algorithms, capacity, overfitting and underfitting., hyperparameters and validation sets, estimators, bias and variance, Bayesian statistics, supervised, unsupervised learning algorithms, stochastic gradient descent, building machine learning algorithm

Unit 3 : 8
 Deep Feedforward Networks: learning XOR, Gradient- based learning, Hidden units, Architecture Design, back propagation and other differentiation algorithms
 Regularization for deep learning- dataset augmentation, noise robustness, semi supervised learning, multitask learning.

Unit 4 : 8
 Convolution networks- convolution operation, pooling, convolution and pooling as an infinitely strong prior, variants of basic convolution function, structured outputs, efficient convolution algorithms. Deep Recurrent networks,
 Recurrent and recursive nets- recurrent neural networks, bidirectional RNNs, deep recurrent networks, recursive neural networks

Unit 5 : 8
 Deep Learning applications: Large scale deep learning, computer vision, speech recognition, natural language processing

Prescribed Text Books:

1. Goodfellow, I., Bengio, Y., and Courville, A., Deep Learning, MIT Press, 2016
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Design Patterns
 Category : PE
 Course Code : 19A57CT
 Year : IV B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand that design patterns are standard solutions to common software design problems.
- Use systematic approach that focus and describe abstract systems of interaction between classes, objects, and communication flow.
- Understand the design patterns that provide common solutions for various objectives of object oriented software applications.
- Understand how these patterns related to object- oriented design.

Unit 1 : INTRODUCTION 9

What Is a Design Pattern, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, how to Select a Design Pattern, how to Use a Design Pattern.

Unit 2 : A CASE STUDY 9

Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.

Unit 3 : CREATIONAL PATTERNS 9

Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

Unit 4 : STRUCTURAL PATTERN PART 9

Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy.

Unit 5 : BEHAVIORAL PATTERNS PART 9

Chain of Responsibility, Command, Interpreter, Iterator. Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns. What to Expect from Design Patterns, A Brief History, The Pattern Community an Invitation, A Parting Thought.

Prescribed Text Books:

1. Design Patterns by Erich Gamma, Pearson Education

Reference Text books:

1. Pattern's in JAVA Vol-I by Mark Grand, Wiley DreamTech.
2. Pattern's in JAVA Vol-II by Mark Grand, Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III by Mark Grand, Wiley DreamTech.
4. Head First Design Patterns by Eric Freeman-Oreilly-spd
5. Design Patterns Explained by Alan Shalloway, Pearson Education

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Understand and identify appropriate patterns for design problems.	L1, L3
2. Learn creational, structural, behavioral patterns.	L1, L3
3. Apply key pattern-oriented software architecture techniques to develop reusable object-oriented software infrastructure and apps.	L1, L3
4. Utilize Java programming language features and libraries to develop pattern oriented -oriented software	L1, L3
5. Successfully apply concurrency patterns to achieve synchronization in Object oriented applications.	L3

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A57CT.1	3	-	-	3	-	-	-	-	-	-	-	3	3	-	-
19A57CT.2	3	3	-	-	-	-	-	-	-	-	-	3	3	-	-
19A57CT.3	3	-	3	3	2	-	-	-	-	-	-	3	3	-	-
19A57CT.4	3	3	3	3	-	-	-	-	-	-	-	3	3	-	-
19A57CT.5	3	3	3	3	2	-	-	-	-	-	1	3	3	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Mobile Ad Hoc Networks
 Category : PE
 Course Code : 19A57DT
 Year : IV B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Acquire knowledge about Ad Hoc networks and mobility models.
- Understand the design issues and classifications of MAC protocols.
- Study about the classifications of routing protocols.
- Acquire knowledge about the QOS issues, Energy Management issues and challenges in Ad Hoc Networks.
- Study about Ad Hoc networks cross layer design and integration for 4G.

Unit 1 : *Introduction* 10
 Introduction to Ad Hoc networks – definition, characteristics, features, applications. Characteristics of Wireless channel, Ad Hoc Mobility Models – Indoor and outdoor models.

Unit 2 : *Medium Access Protocols* 10
 MAC Protocols: design issues, goals and classification. Contention based protocols – with reservation, scheduling algorithm, protocols using directional antennas. IEEE Standards: 802.11a, 802.11b, 802.11g, 802.15, HIPERLAN.

Unit 3 : *Network Protocols* 10
 Routing Protocols: Design issues, goals and classification. Proactive Vs Reactive routing, Unicast routing algorithms, Multicast routing algorithms, Hybrid routing algorithm, Energy aware routing algorithm, Hierarchical routing, QoS aware routing.

Unit 4 : *End to End Delivery and Security* 10
 Transport Layer: Issues in designing – Transport layer classification, Ad Hoc Transport protocols. Security issues in Ad Hoc networks: issues and challenges, network security attacks, secure routing protocols.

Unit 5 : *Cross Layer Design and Integration of Ad Hoc for 4G* 10
 Cross Layer Design: Need for cross layer design, cross layer optimization, parameter optimization techniques, cross layer cautionary perspective. Integration of Ad Hoc with mobile IP network

Prescribed Text books:

1. C.Siva Ram Murthy and B.S.Manoj, Ad hoc Wireless Networks Architectures and protocols, 2nd edition, Pearson Education. 2007
2. Charles E. Perkins, Ad hoc Networking, Addison – Wesley, 2000

Reference Text Books:

1. Stefano Basagni, Marco Conti, Silvia Giordano and Ivan stojmenovic, Mobile adhoc networking, Wiley-IEEE press, 2004.
2. Mohammad Ilyas, The handbook of adhoc wireless networks, CRC press, 2002.
3. T. Camp, J. Boleng, and V. Davies “A Survey of Mobility Models for Ad Hoc Network
4. V.T. Raisinghani and S.Iyer “Cross layer design optimization in wireless protocol

stacks"Comp. communication, vol 27 no. 8, 2004.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|---------------------------------------------------------------------|--------|
| 1. Acquire knowledge about the Ad Hoc networks and mobility models. | L2 |
| 2. Understand the classification of MAC layer protocols. | L1, L2 |
| 3. Analyze the routing protocols for Ad Hoc Networks. | L3 |
| 4. Understand the design issues and QoS of Transport layer. | L2 |
| 5. Understand the cross layer design. | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A57DT.1	3	3	-	-	-	-	1	-	-	-	-	-	3	-	-
19A57DT.2	-	3	3	-	-	-	-	-	-	-	-	-	3	-	3
19A57DT.3	3	3	3	3	2	-	-	-	-	-	-	-	-	2	3
19A57DT.4	-	3	3	3	-	-	-	-	-	-	-	-	3	2	-
19A57DT.5	3	3	-	3	2	-	-	-	-	-	-	-	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Advanced Web Programming Lab
 Category : PC
 Course Code : 19A571L
 Year : IV B. Tech.
 Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
0	0	3	1.5

Course Objectives: This course will able to

11. Know the working of different servers like XAMPP, WAMP and basics of PHP environment
 - know the basic concepts and techniques in building dynamic web pages
 - Analyze different web based applications with PHP and database environment.
 - Create a fully functional website with MVC architecture.

Week1 :

- 1) Installation of apache webserver
- 2) Installation of XAMPP Bundle Server
- 3) Installation of WAMP Bundle Server

Week2 :

Basic Programs in PHP using XAMPP server (from 2nd Unit)

Week3:

Object oriented concept examples using PHP (classes, inheritance, interfaces, etc)

Week4:

Design the following web pages using PHP required for an online book store web site.

1) HOME PAGE:

The home page must contain three frames.

Top frame: Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame: At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link "CSE" the catalogue for CSE Books should be displayed in the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

Fig 1.1

2) LOGIN PAGE:

This page looks like below:

Logo	Web Site Name
------	---------------


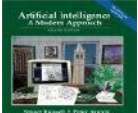


Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Login : <input type="text"/> Password: <input type="text"/> <input type="button" value="Submit"/> <input type="button" value="Reset"/>			

3) CATALOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.

The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE		Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	<input type="button" value="Add to cart"/>
ECE		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	<input type="button" value="Add to cart"/>
EEE		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	<input type="button" value="Add to cart"/>
CIVIL		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	<input type="button" value="Add to cart"/>

Note: Week 5 contains the remaining pages and their description

Week5:

4) CART PAGE:

The cart page contains the details about the books which are added to the cart. The cart page should look like this:

Logo	Web Site Name
------	---------------

Home	Login	Registration	Catalogue	Cart
CSE	Book name		Price	Quantity
ECE	Amount			
EEE	Java 2		\$35.5	
CIVIL	2			\$70
	XML bible		\$40.5	1
			\$40.5	
	Total amount			\$130.5

5) REGISTRATION PAGE:

Create a "registration form" with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

Week6:

VALIDATION:

Write *PHP Script* to validate the following fields of the above registration page.

6. Name (Name should contain alphabets and the length should not be less than 6 characters).
7. Password (Password should not be less than 6 characters length).
8. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
9. Phone number (Phone number should contain 10 digits only).

Week7:

User Authentication: Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a PHP for doing the following.

Create a Cookie and add these four user id's and passwords to this Cookie.

Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display "You are not an authenticated user"

Week8:

Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Week9:

Write a PHP program to connect to that database and extract data from the tables and display them.

Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

Week10:

Write a PHP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

Week11:

Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount) of each category. Modify your catalogue page (week 2) in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using PHP

Week 12:

HTTP is a stateless protocol. Session is required to maintain the state.

The user may add some items to cart from the catalogue page. He can check the cart page for the mselected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time (i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method `session.invalidate()`). Modify your catalogue and cart PHP pages to achieve the above mentioned functionality using sessions.

Week 13:

Introduce Simple AJAXs Script where ever it possible in the above website designed by PHP.

Note: Database programs can be developed in both MySQL and PDO concepts.

Text Books:

1. Jason Gilmore .Beginning PHP and MySQL, Apress Publications (Dream tech.). 3rd edition.
2. Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens .PHP 5 Recipes A problem Solution Approach.
3. Lee BabinBeginning Ajax with PHPFrom Novice to Professional,Apress Publications (Dream tech.). 3rd edition

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Use PHP environment in different types of web servers (XAMPP, WAMP)	L3
2. Apply the object oriented concepts using PHP.	L3
3. Use PHP concepts in development of client/server environment application.	L3
4. Analyze their understanding of PHP and MySQL to create, modify, add, and delete data in a database through a web page in web application.	L4
5. Perceive the fundamentals of AJAX to create good, effective and customized websites using PHP & MySQL.	L3,L6

Department of Computer Science and Engineering

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A571L.1	-	-	-	-	3	-	-	-	3	-	-	3	3	-	-
19A571L.2	-	-	3	-	3	-	-	-	3	-	-	-	-	-	-
19A571L.3	-	-	-	3	3	-	1	-	3	-	-	-	3	-	2
19A571L.4	-	-	3	3	3	-	-	-	3	-	-	3	3	-	-
19A571L.5	1	-	3	3	3	-	-	-	3	-	-	3	3	-	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : IoT & CASE Tools Lab
Category : PC
Course Code : 19A573L
Year : IV B. Tech.
Semester : I Semester

Lecture Hours	Tutorial Hours	Practical	Credits
0	0	3	1.5

Course Objectives: This course will able to

- Understand the terminology, technology and its applications of IoT.
- Memorize the software platforms which are used for developing the applications.
- Learn the concepts of python programming language which was used to develop the IoT projects.
- Learn the concepts of Arduino IDE which is used to develop the IoT projects in Arduino Kits.
- Know the hardware platforms which is necessary to develop the IoT applications.

IoT Lab

Week1 :

Start Raspberry Pi, and try Various Linux Commands in Command Terminal Windows :
(is,cd,touch,mv,nm,man,mkdir,tar,gzip,cat,more,less,ps,sido,cron,chown,chgrp,ping etc)

Week2 :

Run Python Programs On Raspberry Pi

- Read your Name and Print Hello Message With name read two numbers, and Print their Sum, difference, Product and Division.
- Word and character count of a given String
- Area of a given Shape (rectangles , Triangle and Circle) Reading Shape and appreciate Values from Standard input
- Print a name "n" Times where name and n are read from standard input, using for and While loops.
- Handle divided by Zero Exception
- Print current time for ten minutes with an interval of 10 seconds

Week3:

Light an LED Through Python Programs.

Week4:

Flash an LED At a Given on Time And OFF Time Cycle, where the Two Times are Taken From a File.

Week5:

Access an Image Through a Pi Web Cam

Week6:

Detect the motion of an object using the PIR sensor.

Week7:

Blinking a multiple LED's Blink using ARDUINO IDE.

Week8:

Controlling the traffic light signals using ARDUINO IDE.

Week9:

Calculate the distance of an object with the help of UltraSonic Sensor in ARDUINO IDE.

Week10:

Detect the Moisture of an Soil using Soil Moisture sensor in Arduino IDE.

Week11:

- a) Controlling the Led blink using Switch.
- b) Measure the Temperature and humidity using DHT11 Sensor.

Prescribed Text Books:

1. The Internet of Things Connecting Objects to the Web, HakimaChaouchi, Wiley publications, 2010.
2. Designing the Internet of Things, Adrian McEwen, Hakim Cassimally, Wiley 2014.
3. Enterprise IoT, A Definitive Handbook by Naveen Balani.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|----------------------------------------------------------------------------------------------------------------------------------|----|
| 1. Use different types of sensors required for developing the IoT projects. | L3 |
| 2. Identify the difference between different hardware and software platforms which is necessary to develop the IoT applications. | L3 |
| 3. Create the IoT experiments in Arduino IDE. | L6 |
| 4. Create the IoT experiments with the help of Python programs. | L6 |
| 5. Design the IoT applications which maps to problems of real world Scenarios. | L6 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A573L.1	-	-	-	3	3	3	1	1	-	-	-	1	3	2	3
19A573L.2	-	-	-	-	3	-	-	-	-	1	-	-	3	3	3
19A573L.3	-	-	3	3	3	-	-	-	-	-	-	-	3	3	3
19A573L.4	-	-	3	3		-	-	-	-	-	-	-	3	3	3
19A573L.5	1	1	3	3	3	3	-	-	-	-	-	-	3	3	3

CASE Tools Lab

Course Objectives: This course will able to

12. Know the need of models in the software development process
 - Understand the need of classes and identifying their behavior.
 - Provide the knowledge of Use case and Interaction diagrams.
 - Implement State Machines
 - Design and Develop Subsystems

Case Study for ATM

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

The software to be designed will control a simulated automated teller machine (ATM) having a

magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs.500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

The student should take up the case study of ATM system and Model it in different views i.e. Use case view, logical view, component view, Deployment view.

- Design a Use case Diagram for ATM system
- Design a Sequence Diagram for ATM system
- Design a Collaboration Diagram for ATM system
- Design a Activity Diagram for ATM system
- Design a State Chart Diagram for ATM system
- Design a Class Diagram for ATM system,
- Design a Component Diagram for ATM system
- Design a Deployment Diagram for ATM system

Task 2:

The student should take up case study of any system on their own and Model all the above diagrams in different views.

Text Books:

1. Grady Booch, James Rumbaugh, IvarJacobson : The Unified Modeling Language User Guide, Pearson Education.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-

DreamtechIndia Pvt. Ltd.

Course Outcomes:

Student will be able to

1. Know the basics of different diagrams and Relations.
2. Learn the importance of Class Diagram.
3. Draw the use case and interaction diagrams.
4. Implementing state machines.
5. Draw the component and deployment diagrams.

Blooms Level of Learning

- L1
L2
L3,L4
L3
L3, L4

CO-PO mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A573L.1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
19A573L.2	-	2	3	1	3	1	-	-	-	3	-	-	3	-	3
19A573L.3	-	-	3	-	-	-	-	-	3	3	3	3	-	-	3
19A573L.4	-	-	3	-	3	-	-	2	3	3	-	3	-	-	-
19A573L.5	-	-	3	-	3	-	-	2	-	3	3	3	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course: DISASTER MANAGEMENT
Category : OE
Course Code : 19A18DT
Year : IV Year
Semester : II Semester (Common to CE, ME, CSE)

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	-	3

Course Objectives:

The course is intended to provide a general concept in the dimensions of disasters caused by nature beyond the human control as well as the disasters and environmental hazards induced by human activities with emphasis on disaster preparedness, response and recovery.

Unit 1 : (6hrs)
INTRODUCTION - Concepts and definitions: disaster, hazard, vulnerability, risk, capacity, prevention, mitigation).

Unit 2 : (10hrs)
DISASTERS - Disasters classification; natural disasters (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.); manmade disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills etc); hazard and vulnerability profile of India, mountain and coastal areas, ecological fragility.

Unit 3 : (9hrs)
DISASTER IMPACTS - Disaster impacts (environmental, physical, social, ecological, economical, political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs); hazard locations; global and National disaster trends; climate-change and urban disasters.

Unit 4 : (9hrs)
Disasters, Environment and Development - Factors affecting vulnerability such as impact of developmental projects and environmental modifications (including of dams, land-use changes, urbanization etc.), sustainable and environmental friendly recovery; reconstruction and development methods.
DISASTER RISK REDUCTION (DRR) - Disaster management cycle–its phases; prevention, mitigation, preparedness, relief and recovery; structural and non-structural measures; risk analysis, vulnerability and capacity assessment; early warning systems, Post-disaster environmental response (water, sanitation, food safety, waste management, disease control); Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster risk reduction, DRR programmes in India and the activities of National Disaster Management Authority.

Unit 5 : (9hrs)
Disasters, Environment and Development - Factors affecting vulnerability such as impact of developmental projects and environmental modifications (including of dams, land-use changes, urbanization etc.), sustainable and environmental friendly recovery; reconstruction and development methods.

Prescribed Text Books:

1. Disaster Management Guidelines, GOI-UND Disaster Risk Program (2009-2012)
2. Damon, P. Copola, (2006) Introduction to International Disaster Management, Butterworth Heineman.
3. Gupta A.K., Niar S.S and Chatterjee S. (2013) Disaster management and Risk Reduction, Role of Environmental Knowledge, Narosa Publishing House, Delhi.
4. Murthy D.B.N. (2012) Disaster Management, Deep and Deep Publication PVT. Ltd. New Delhi.
5. Modh S. (2010) Managing Natural Disasters, Mac Millan publishers India LTD.

Reference Books:

1. <http://ndma.gov.in/> (Home page of National Disaster Management Authority).
2. <http://www.ndmindia.nic.in/> (National Disaster management in India, Ministry of Home Affairs).
3. Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.
4. Singh B.K., 2008, Handbook of Disaster Management: techniques & Guidelines, Rajat Publication.
5. Ghosh G.K., 2006, Disaster Management, APH Publishing Corporation.

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. The students increase the knowledge and understanding of the disaster phenomenon and, its factors.	L1
2. The students must learn various classification of disasters hazard and vulnerability profile of India.	L4
3. The students will learn impacts, global and national disaster trends	L2
4. The students will learn disaster management cycle and its phases and DRR programmes in India and activities of national disaster management academy.	L3
5. The students should be able to analyze factors affecting vulnerability of developmental projects and environmental modifications for sustainable development.	L6

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A18DT.1	-	-	-	-	2	1	-	2	2	2	-	-	-	-	-
19A18DT.2	1	-	-	-	-	-	-	2	3	3	-	2	-	-	-
19A18DT.3	1	-	-	-	-	3	-	3	2	2	-	-	-	-	-
19A18DT.4	-	-	-	-	-	-	-	3	3	3	-	2	-	-	-
19A18DT.5	1	-	-	-	-	-	2	3	-	-	-	3	-	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course: Building Planning and Construction
Category : OE
Course Code : 19A18ET
Year : IV B. Tech.
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives:

- Teach to supervision of different types of masonry
- Illustrate the methodology in selection of materials, design and supervision of suitable type of floor and roof
- To ensure the student to be aware of building byelaws.
- To make the student to understand about principles of planning, standards and requirements of Residential building and Public building

Unit 1 : Building Byelaws and Regulations (8hrs)

Introduction –Terminology –Objectives of building byelaws –Floor area ratio (FAR) –Floor space Index (FSI) –Principles underlying building byelaws –classification of buildings –Open space requirements – built up area limitations –Height of Buildings –Wall thickness –lighting and ventilation requirement.

Unit 2 : *Planning of Residential buildings* (10hrs)

Minimum standards for various parts of buildings –requirements of different rooms and their grouping – characteristics of various types of residential buildings. Principles of planning- architectural principle, Aspects of planning within and with respect to surroundings, Modular planning concept.

Unit 3 : *Planning of Public buildings* (10hrs)

Planning of Educational institutions, hospitals, dispensaries, Office buildings, banks, industrial buildings, hotels and motels, buildings for recreation. Elements of Perspective Drawing: Definition, concept and single and two point perspective

Unit 4 : Building components & foundations (9hrs)

Building components: Lintels, Arches, and stair cases – Types. Different types of floors-Concrete, Mosaic, Terrazo floors, Pitched, flat and curved Roofs. Lean-to-Roof, Coupled Roofs, Trussed roofs- King and Queen Post Trusses. RCC Roofs.

Foundations: Shallow foundations – Spread, combined, strap and mat foundations.

Unit 5 : (8hrs)

Masonry: Types of masonry, English and Flemish bonds, Rubble and Ashlar masonry, cavity and partition walls.

Finishings: Damp proofing- materials used. Plastering, pointing, white washing and distempering – Painting – Constituents of a paint – Types of paints – Painting of new/old Wood – Varnish – Form work and scaffolding.

Prescribed Text Books:

1. Building Planning & Drawing by Dr N. Kumaraswamy and A.Kameswara Rao, Charitor Publications.
2. Planning and Designing and Scheduling- Gurucharan Singh and Jagadish Singh – Standard

Publishers.

3. Planning and Designing of Buildings – Y.S.Sane.
4. Building Construction by P.C. Varghese, Prentice-Hall of India private Ltd, New Delhi.
5. Building Construction by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi.
6. National Building Code of India.

Reference Text books:

1. Sikka, V.B. (2013), A Course in Civil Engineering Drawing, S. K. Kataria& Sons
2. R.Chudly “Construction Technology “– Volumes I and II” 2nd Edition, Longman, UK, 1987.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|--------------------------------------------------------------------------------------------|----|
| 1. Understand Building Byelaws & regulations. | L2 |
| 2. Understand principles of planning, standards and requirements for residential building. | L2 |
| 3. Understand principles of planning, standards and requirements for public building. | L2 |
| 4. Summarize different types of masonry and foundations | L3 |
| 5. Understand different types of building components and finishing works | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A18ET.1	-	-	-	-	-	3	1	-	2	-	-	-	-	2	3
19A18ET.2	-	-	-	-	-	3	1	-	2	-	-	-	-	2	3
19A18ET.3	-	-	-	-	-	3	1	-	2	-	-	-	-	2	3
19A18ET.4	-	-	-	-	-	3	1	-	2	-	-	-	-	2	3
19A18ET.5	-	-	-	-	-	3	1	-	2	-	-	-	-	2	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES RAJAMPET
(AN AUTONOMOUS INSTITUTION)

Title of the Course : Battery Energy Storage Systems
 Category : OE
 Course Code : 19A28DT
 Year : IV B. Tech
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives:

- To enable the student to understand the need for Energy Storage.
- To learn sufficient knowledge about various Energy Storage Technologies.
- To deal with grid connected Battery Energy Storage System.
- To study the Challenges, Risk and Policy of Battery Energy Storage System.

Unit-1: Introduction to Energy Storage for Power Systems 9
 Emerging needs for Electrical Energy Storage -Role of Energy Storage Systems-Applications. Overview of energy storage technologies: Thermal, Mechanical, Chemical, Electrochemical, Electrical-Efficiency of Energy Storage Systems.

Unit-2: Energy Storage Technologies 9
 Storage Types - Components of a Battery Energy Storage System (BESS) - Energy Storage System Components -Grid Connection for Utility-Scale BESS Projects -Battery Chemistry Types -Lead-Acid (PBA) Battery - Nickel-Cadmium (Ni-Cd) Battery-Lithium-Ion (Li-Ion) Battery.

Unit-3: Grid Applications of Battery Energy Storage Systems 9
 Scoping of BESS Use Cases - General Grid Applications of BESS -Technical Requirements -Round-Trip Efficiency - Response Time - Lifetime and Cycling - Sizing - Operation and Maintenance.

Unit -4: Challenges and Risks 9
 Grid Tariff Applications and Licensing Issues -Battery Safety - Challenges of Reducing Carbon Emissions - Battery Recycling and Reuse Risks -Examples of Battery Reuse and Recycling - Reuse of Electric Vehicle Batteries for Energy Storage - Recycling Process.

UNIT -5: Policy Recommendations 9
 Frequency Regulation - Renewable Integration -Distribution Grids -Transmission Grids - Peak Shaving and Load Leveling – Microgrids

Text Books:

1. YongpingZhai. *Handbook on Battery Energy Storage System* Asian Development Bank.2018.
2. James M. Eyer, Joseph J.lannucci and Garth P. Corey .*Energy Storage Benefits and Market Analysis*, Sandia National Laboratories, 2004.
3. Jim Eyer, Garth Corey”, *Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide*, Report, Sandia National Laboratories, Feb 2010.

Reference Books:

1. Doughty, D. H., and E. Peter Roth. 2012. A General Discussion of Li Ion Battery Safety. *Electrochemical Society Interface* 21 (2): 37–44. DOI: 10.1149/2.F03122if.

2. Electric Power Research Institute (EPRI). 2010. Electricity Energy Storage Technology Options: A White Paper Primer on Applications, Costs, and Benefits. Palo Alto, California, US. <http://large.stanford.edu/courses/2012/ph240/doshay1/docs/EPRI.pdf>
3. Enel Green Power. 2016. Integrating Renewable Power Plants with Energy Storage. 7 June. <http://www.iefc.unibocconi.it/wps/wcm/connect/29b685e1-8c34-4942-8da3-6ab5e701792b/Slides+Lanuzza+7+giugno+2016.pdf?MOD=AJPERES&CVID=1le7w78>.
4. Initial Operating Experience of the La Ola 1.2-MW Photovoltaic System. Sandia National Laboratories Report SAND2011-8848. Kane, Mark. 2015. Bosch Cooperates With BMW And Vattenfall In Second Life Battery Project. Inside EVs 9 February. <https://insideevs.com/bosch-cooperates-with-bmw-and-vattenfall-in-second-lifebattery-project/>

Course outcomes: At the end of the course the student will be able to

1. Understanding the need of the Energy Storage Systems.
2. Study and Analyse the function of each storage Technology, its Types.
3. Explore the Battery Energy Storage applications in Renewable energy systems and in Smart grid.
4. Study the Challenges, Risk and Policy recommendation of Battery Energy Storage Systems.

COs-POs-PSOs Mapping

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	2	1
19A28DT .1	2	-	-	1	-	-	1	-	1	-	-	-	1	-
19A28DT .2	2	2	1	1	-	-	1	-	-	-	-	-	1	-
19A28DT .3	2	1	1	1	-	-	1	-	2	-	-	-	1	1
19A28DT .4	2	1	1	1	-	-	2	-	1	-	-	-	2	1

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES RAJAMPET
(AN AUTONOMOUS INSTITUTION)

Title of the course : System modeling and Simulation
Category : OE
Course code : 19A28ET
Year : IV B.Tech.
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical Hours	Credits
3	-	-	3

Course Objectives

- To understand the basic system concepts and definitions of system.
- Techniques to model and to simulate various systems.
- To analyze a system and to make use of the information to improve the performance

Unit 1: Introduction to simulation models 10
Basic Simulation Modeling, Systems, Advantages and disadvantages of simulation, Models and Simulation, Discrete Event Simulation, Simulation of Single Server Queuing System, Simulation of Inventory System, Alternative approach to Modeling and Simulation

Unit-2: Simulation software 10
Comparison of Simulation Packages with Programming Languages, Classification of Software, Desirable Software Features, General Purpose Simulation Packages – Arena, Extend and Others, Object Oriented Simulation, Examples of Application Oriented Simulation Packages.

Unit-3 Building simulation models and time driven simulation models 08
Guidelines for Determining Levels of Model Detail, Techniques for Increasing Model Validity and Credibility, Modeling Time Driven Systems: Modeling Input Signals, Delays, System Integration, Linear Systems, Motion Control Models, Numerical Experimentation.

Unit-4 Exogenous signals and events and markov Process 12
Disturbance Signals, State Machines, Petri Nets & Analysis, System Encapsulation, MARKOV Process: Probabilistic Systems, Discrete Time Markov Processes, Random Walks, Poisson Processes, the Exponential Distribution, Simulating a Poison Process, Continuous-Time Markov Processes.

Unit- 5 Event driven models and system optimization 10
Simulation Diagrams, Queuing Theory, characteristics of queuing system, Simulating Queuing Systems, Types of Queues, Multiple Servers, System Identification, Searches, Multidimensional Optimization, Modeling and Simulation Mythology.

Text Books:

1. System Modeling & Simulation, an Introduction – Frank L. Severance, John Wiley & Sons, 2001.
2. Simulation Modeling and Analysis – Averill M. Law, W. David Kelton, TMH, 3rd Edition, 2003.

Reference Book:

1. Systems Simulation – Geoffrey Gordon, PHI, 1978.

Course Outcomes:

1. Define basic concepts in Modeling and Simulation.
2. Understand the fundamental logic, structure, components and management of simulation modeling & demonstrate knowledge of how to use arena

Department of Computer Science and Engineering

3. Classify various simulation models and give practical examples for each category
4. Generate and test random number varieties and apply them to develop simulation models
5. Analyze output data produced by a model and test validity of the model.
6. Perform statistical analysis of output from terminating simulation.

COs-POs-PSOs Mapping

Course Outcomes	Program Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
19A28ET .1	3	3	3	3	3					3	3	-
19A28ET .2	3	3	3	3	3					3	1	-
19A28ET .3	3	3	3	3	3					3	3	-
19A28ET .4	3	3	3	3	3					3	3	-
19A28ET .5	3	3	3	3	3					3	3	-
19A28ET .6	3	3	3	3	3					2	2	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Entrepreneurship Development
Category : OEC
Course Code : 19A38ET
Year : IV Year
Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	-	3

Course Objectives:

- To develop and strengthen entrepreneurial quality and motivation in students
- To impart basic entrepreneurial skills and understanding to run a business efficiently and effectively.

Unit 1 Entrepreneurship 09
Entrepreneur – Types of Entrepreneurs – Difference between Entrepreneur and Intrapreneur
Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth.

Unit 2 Motivation 09
Major Motives Influencing an Entrepreneur – Achievement Motivation Training, Self-Rating, Business Games, Thematic Apperception Test – Stress Management, Entrepreneurship Development Programs – Need, Objectives.

Unit 3 Business 10
Small Enterprises – Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a Business – identifying, selecting a Good Business opportunity, Market Survey and Research, Techno Economic Feasibility Assessment – Preparation of Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and Agencies.

Unit 4 Financing And Accounting 09
Need – Sources of Finance, Term Loans, Capital Structure, Financial Institution, Management of working Capital, Costing, Break Even Analysis, Taxation – Income Tax, Excise Duty – Sales Tax.

Unit 5 Support To Entrepreneurs 09
Sickness in small Business – Concept, Magnitude, Causes and Consequences, Corrective Measures - Business Incubators – Government Policy for Small Scale Enterprises – Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Sub Contracting

Prescribed Text Books:

1. Khanka. S.S., "Entrepreneurial Development" S.Chand& Co. Ltd., Ram Nagar, New Delhi, 2013. ISBN : 81-219-1801-4
2. Donald F Kuratko, "Entrepreneurship – Theory, Process and Practice", 9th Edition, Cengage Learning, 2014. ISBN-10: 1285051750

Reference Books:

1. Hisrich R D, Peters M P, "Entrepreneurship" 8th Edition, Tata McGraw-Hill, 2013. ISBN 1843769964
2. Mathew J Manimala, "Entrepreneurship theory at cross roads: paradigms and praxis" 2nd Edition Dream tech, 2005. ISBN 81-297-0260-6

3. Rajeev Roy, "Entrepreneurship" 2nd Edition, Oxford University Press, 2011. ISBN 10: 0198072635
4. EDII "Faculty and External Experts – A Hand Book for New Entrepreneurs Publishers: Entrepreneurship Development", Institute of India, Ahmadabad, 1986. ISBN 0-07-026694-8

Course Outcomes:

Student will be able to

- | | |
|---------------------------------------------------------------------|--------------------------|
| | Blooms Level of Learning |
| 1. Understand the basic concepts of entrepreneurship | L2 |
| 2. Understand the importance of motivation for entrepreneur | L2 & L3 |
| 3. Gain knowledge and skills needed to run a business successfully. | L3, L4 & L5 |
| 4. Learn the concepts of financing and accounting | L3 |
| 5. Understand the basic concepts of various supporting process | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A35KT.1	3	-	-	-	-	-	-	-	3	3	-	2	-	-	-
19A35KT.2	3	-	-	-	-	-	-	-	-	3	-	-	-	-	-
19A35KT.3	3	-	-	-	-	2	-	2	2	3	-	3	-	-	-
19A35KT.4	3	3	-	-	-	-	-	-	3	3	-	-	-	-	-
19A35KT.5	3	-	-	-	-	-	-	-	3	3	-	-	-	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Optimization in Engineering
 Category : OEC
 Course Code : 19A38FT
 Year : IV Year
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	0	3

Course Objectives:

- To enable the students to the nature and scope of various decision making situations within business contexts, understand and apply operations research techniques to industrial applications.
- To learn the fundamental techniques of Operations Research and to choose a suitable OR technique to solve problem

Unit 1 12
 Linear Programming: Problem Formulation, Graphical solution, Simplex method, Artificial variables techniques -Two-phase method, Big-M method – Duality Principle

Unit 2 12
 Transportation Mode: Formulation, Optimal solution, unbalanced transportation problem, Degeneracy. Assignment Model: Formulation, Optimal solution, Variants of Assignment Problem, Travelling Salesman problem.

Unit 3 09
 Theory of Games: Introduction – minimax - maximin – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – 2 X 2 games – m X 2, 2 X n & m x n games -Graphical method, Dominance principle

Unit 4 : 07
 Waiting Lines: Introduction – single channel – Poisson arrivals – exponential service times – with infinite queue length models.
 Simulation: Definition – Types of simulation models – phases of simulation– applications of simulation – Queuing problems – advantages and disadvantages – Simulation languages.

Unit 5 : 08
 Inventory: Introduction – Single item – Deterministic models – Purchase inventory models with one price break and multiple price breaks
 Dynamic Programming: Introduction – Bellman's Principle of optimality – Applications of dynamic programming- shortest path problem – linear programming problem

Prescribed Text Books:

1. PS Gupta, DS Hira, Operations Research, S Chand Publications, 10th Edition, 2016, ISBN-13978-8121902816
2. S.D. Sharma, Operations Research, Kedarnath and Ramnath Publications, 2012, ISBN-135551234001596

Reference Books:

1. Taha, *Introduction to Operations Research*. PHI, 10 th edition, 2016, ISBN-13978-0134444017

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Total Quality Management
 Category : OEC
 Course Code : 19A38GT
 Year : IV Year
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	-	0	3

Course Objectives:

- To introduce the students, the basic concepts of Total Quality Management.
- To expose with various quality issues in Inspection.
- To gain Knowledge on quality control and its applications to real time.
- To know the extent of customer satisfaction by the application of various quality concepts.
- To understand the importance of Quality standards in Production.

Unit 1 Introduction 10
 Definition of Quality, Dimensions of Quality, Definition of Total quality management, Quality Planning, Quality costs – Analysis, Techniques for Quality costs, Basic concepts of Total Quality Management.

Unit 2 Historical Review 09
 Quality council, Quality statements, Strategic Planning, Deming Philosophy, Barriers of TQM Implementation, Benefits of TQM, Characteristics of successful quality leader, Contributions of Gurus of TQM, Case studies.

Unit 3 TQM Principles 08
 Customer Satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment teams, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure Case studies

Unit 4 TQM Tools 09
 Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA, The seven tools of quality, Process capability, Concept of Six Sigma, New Seven management tools, Case studies.

Unit 5 Quality Systems 08
 Need for ISO 9000 and Other Quality Systems, ISO 9000: 2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, QS 9000, ISO 14000 – Concept, Requirements and Benefits, Case Studies.

Prescribed Text Books:

1. Dale H Besterfield, Total Quality Management, Fourth Edition, Pearson Education, 2018, ISBN: 9789332534452
2. SubburajRamaswamy, Total Quality Management, Tata Mcgraw Hill Education., 2012, ISBN: 1259001415, 9781259001413
3. Joel E.Ross , Total Quality Management, Third Eition, CRC Press, 2017, ISBN: 9781351407786

Reference Books:

1. Narayana V and Sreenivasan N.S, Quality Management – Concepts and Tasks, NewAge International, 1996, ISBN-10: 8122416802.
2. Robert L.Flood, Beyond TQM, First Edition, John Wiley & Sons Ltd, 1993, ISBN: 9780471939672.
3. Richard S. Leavenworth & Eugene Lodewick Grant, Statistical Quality Control, Seventh Edition, Tata Mcgraw Hill, 2015, ISBN, 0070241147, 9780070241145.
4. Samuel Ho , TQM – An Integrated Approach, Kogan Page Ltd, USA, 1995, ISBN: 9780749415617.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <ol style="list-style-type: none"> 1. Develop an understanding on quality Management philosophies and frameworks. 2. Adopt TQM methodologies for continuous improvement of quality. 3. Measure the cost of poor quality, process effectiveness and efficiency to identify areas for improvement. 4. Apply benchmarking and business process reengineering to improve management processes. 5. Determine the set of indications to evaluate performance excellence of an organization. | <p>L2</p> <p>L3</p> <p>L4</p> <p>L3</p> <p>L3</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A37GT.1	2	-	-	-	-	2	2	-	-	-	2	1	-	-	-
19A37GT 2	2	2	-	2	-	2	-	-	-	1	2	1	-	-	-
19A37GT 3	1	2	-	2	-	-	-	1	1	1	2	1	-	-	-
19A37GT 4	1	-	-	-	-	1	-	-	-	-	2	1	-	-	-
19A37GT 5	1	-	-	-	-	-	-	-	-	-	2	2	-	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Introduction to Digital Design
 Category : OE
 Course Code : 19A48DT
 Year : IV B.Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: The course aims to provide the student with the ability

- To get the knowledge on Number Systems and codes.
- To gain the knowledge on Boolean algebra.
- To acquire the knowledge of various circuits in Digital design.

Unit 1 : Number systems, Codes & Boolean Algebra 14
 Philosophy of number systems – r , $(r-1)$'s complement, representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes. Boolean algebra: Fundamental postulates of Boolean algebra, Basic theorems and properties, digital logic gates, properties of XOR gate, universal gates.

Unit 2 : Switching Functions and Their Minimization 14
 Switching Functions-Canonical and Standard forms, algebraic simplification using Boolean theorems, two level & Multilevel Realization of Boolean Functions using Universal Gates. Minimization: K-Map methods, Prime implicants, don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicants chart, simplification rules

Unit 3 : Combinational Logic Design & Programmable Logic Devices 10
 Design using conventional logic gates-Binary Adders, Subtractors, Ripple Adder, carry Look Ahead adder, Magnitude comparator, Encoder, Decoder, Multiplexer, De-Multiplexer, Code converters. PLD's: ROM, PROM, PLA, PAL, and Realization of Switching functions using PLD's. Comparison between PLA, PAL, ROM.

Unit 4 : Sequential Circuits 9
 Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples), Basic flip-flops, Triggering and excitation tables, flip flop conversions, Steps in synchronous sequential circuit design, Design of modulo-N Synchronous counters – up/down counter, ring counter, Johnson counter

Unit 5 : FSM Minimization and ASM Chart 12
 Finite state machine- capabilities and limitations, Mealy and Moore models and their conversions Sequence detector, Serial binary adder. Minimization of completely specified sequential machines- Partition techniques. Salient features of the ASM chart, Simple examples

Prescribed Text Books:

1. Morris Mano, Digital Design. Prentice Hall India, 3 rdEd.
2. ZVI Kohavi and Niraj K. Jha Switching & Finite Automata theory. Tata McGraw Hill, 3 rdEd.

Reference Text books:

1. Charles H. Roth, Fundamentals of Logic Design. Thomson Publications, 2004, 5 th Ed.

Department of Computer Science and Engineering

2. Fletcher, an Engineering Approach to Digital Design. Prentice Hall India.
3. Anand Kumar, Switching Theory and Logic Design. Prentice Hall India, 2008.

Course Outcomes:

Upon completion of the course, student can

- | | Blooms Level of Learning |
|------------------------------------------------------------------------------------------------|--------------------------|
| 1. Understand different number systems conversions & Binary codes | L2 |
| 2. Simplify Boolean functions & realize them using digital logic gates. | L5 |
| 3. Design various combinational & sequential circuits. | L6 |
| 4. Understand the Minimization techniques of Finite State Machine & the elements of ASM chart. | L2 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A48DT.1	2	3	2	-	2	-	-	1	-	-	2	-	3	-	-
19A48DT.2	2	2	2	-	-	1	-	1	-	-	2	-	2	2	-
19A48DT.3	2	2	2	-	-	1	-	1	-	-	2	-	-	3	-
19A48DT.4	2	2	2	-	-	1	-	1	-	-	2	-	-	3	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : INDUSTRIAL ELECTRONICS
 Category : OE
 Course Code : 19A48ET
 Year : IV B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

13. Power quality terminology, power quality issues, classification
 - Different sources of power quality disturbances
 - Harmonic distortion; Principles for controlling harmonics
 - Power quality measuring equipment; Power quality monitoring standards
 - Impact of distributed generation on power quality

Unit 1 : INTRODUCTION TO POWER QUALITY 8
 Power Quality- definition, terminology, issues, evaluation procedure, responsibilities of the suppliers and users of electric power, power quality standards, CBEMA and ITI curves.

Unit 2 : POWER QUALITY DISTURBANCES 10
 General classes of power quality problems- Impulsive and oscillatory transients. Long duration voltage variations - over voltage, under voltage, sustained interruption. Short duration voltage variations- interruption, sag, swell and outage. Sources of sags and interruptions, estimating voltage sag performance overview of mitigation methods.

Unit 3 : FUNDAMENTALS OF HARMONICS 10
 Harmonic distortion, voltage versus current distortion, harmonics versus transients, power system quantities under non-sinusoidal conditions, harmonic indices. Harmonic sources from commercial and industrial loads. Effects of harmonic distortion. Applied harmonics - harmonic distortion evaluation, principles of controlling harmonics, and devices for controlling harmonic distortion. Harmonic filter design and standards on harmonics.

Unit 4 : POWER QUALITY MONITORING 9
 Power quality benchmarking, monitoring considerations, choosing monitoring locations, permanent power quality monitoring equipment, historical perspective of power quality measuring instruments. Power quality measurement equipment-types of instruments, assessment of power quality measurement data, power quality monitoring standards.

Unit 5 : DISTRIBUTED GENERATION AND GRID INTERCONNECTION 8
 Distributed generation -connection requirements and impacts on the network. Interaction and optimal location of DG-Eigen analysis and voltage interaction. Power quality in DG-Mitigation of voltage dip during motor start, harmonic effects with DG, voltage flicker and fluctuation. Islanding issues, distribution line compensation-heavy Load and Light load condition, real generation, protection issues for distributed generation, technologies for distributed generation, power quality impact from different DG types.

Prescribed Text Books:

1. Roger C. Dugan, Mark F. Mc Granaghan, Surya Santoso, H. Wayne Beaty, Electrical Power Systems Quality, 3rd edition, TMH Education Pvt. Ltd., 2012.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Cognitive Science
 Category : PE
 Course Code : 19A58AT
 Year : IV B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Gain knowledge in basic human behavior, processing models in psychology
- Understand computational modeling of an image
- Design hypothesis using machine learning algorithms
- Understand neural network models for an human behavior

Unit 1 : *Introduction to Cognitive science* 9

The prehistory of cognitive science, The reaction against behaviorism in psychology, The theory of computation and the idea of an algorithm, Linguistics and the formal analysis of language, Information-processing models in psychology

Unit 2 : *The Integration Modelling* 9

Language and micro-worlds, Information processing in mental imagery, An interdisciplinary model of vision, Extending computational modeling to the brain, Mapping the stages of lexical processing

Unit 3 : *Information-processing models of the mind* 9

The physical symbol system hypothesis, From physical symbol systems to the language of thought, Expert systems, machine learning and the heuristic search hypothesis, ID3: An algorithm for machine learning, WHISPER: Predicting stability in a block world

Unit 4 : *Neural networks and distributed information processing* 9

Neurally inspired models of information processing, Single-layer networks and Boolean functions, Multilayer networks, Information processing in neural networks: Key features

Unit 5 : *Neural network models of cognitive processes* 9

Language and rules: The challenge for information-processing models, Language learning in neural networks

Object permanence and physical reasoning in infancy, Neural network models of children's physical reasoning

Prescribed Text books:

1. Jose leuzBermudz, Cognitive Science: An introduction to science of mind, 2nd Edition, Cambridge university press, 2014.
2. Jay Friedenber, Gordon Silverman, Cognitive Science: An introduction to science of mind, Sage publications, 2006.

Reference Text Books:

1. Jose leuzBermudz, Cognitive Science: An introduction to science of mind, 2nd Edition, Cambridge university press, 2014.
2. Jay Friedenber, Gordon Silverman, Cognitive Science: An introduction to science of mind, Sage publications, 2006.

Department of Computer Science and Engineering

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-----------------------------------------------------------|----|
| 1. Understand the basic human behaviorism of psychology | L1 |
| 2. understand Information processing models of psychology | L3 |
| 3. Evaluate the hypothesis for models | L5 |
| 4. Apply the neural network models for processing | L3 |
| 5. design their own model for an activity | L6 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A58AT.1	3	3	3	-	-	1	-	1	-	-	-	-	3	-	-
19A58AT.2	-	-	3	3	2	-	-	-	-	-	-	-	3	-	3
19A58AT.3	-	-	3	3	-	-	-	-	-	-	-	-	3	-	3
19A58AT.4	3	3	-	3	-	-	-	-	-	-	-	-	3	-	-
19A58AT.5	3	-	-	-	2	-	-	-	-	-	-	-	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Data Science
 Category : PE
 Course Code : 19A58BT
 Year : IV B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Provide knowledge and expertise to become a proficient data scientist.
- Fundamental knowledge of concepts underlying data science and give a hands-on experience with real-world data analysis.
- Demonstrate an understanding of statistics and machine learning concepts that are vital for data science.
- Demonstrates the importance of recommendation engines for data analysis.
- Critically evaluate data visualizations based on their design and use for communicating stories from data

Unit 1 : 9
 INTRODUCTION: What is Data Science? - Big Data and Data Science hype – and getting past the hype - Why now? – Datafication - Current landscape of perspectives – the Skill needed to do data science. Statistical Inference - Populations and samples – Modeling - statistical modeling, probability distributions, fitting a model.

Unit 2 : 12
 DATA ANALYSIS AND ALGORITHMS: Exploratory Data Analysis (EDA), tools for EDA, The Data Science Process, role of data scientist's, case study. Algorithms: Machine Learning Algorithms, Three Basic Algorithms - Linear Regression - k-Nearest Neighbors (k-NN) - k-means – SVM, Naïve Bayes, Logistic Regression.

Unit 3 : 9
 EXTRACTING MEANING FROM DATA: Feature Selection – User Retention, Feature Generation and Extraction - Feature Selection algorithms – Filters; Wrappers; Decision Trees; Entropy, Random Forests. Google's Hybrid approach to Social Research.

Unit 4 : 9
 RECOMMENDATION ENGINES: Role of data in Building a User-Facing Data Product, Algorithmic ingredients of a Recommendation Engine, Bipartite graph, Nearest Neighbor algorithm and its problems. Dimensionality Reduction: Singular Value Decomposition - Principal Component Analysis - Exercise: build your own recommendation system.

Unit 5 : 12
 DATA VISUALIZATION: Types of data visualization, plots, graphs and summary statistics, Data for visualization, Technologies for visualization. Social Network Analysis- Data Engineering – MapReduce, Pregel, Hadoop, Next Generation Data Scientists- Applications of Data Science- Recent trends and development in Data Science.

Prescribed Text Books:

1. Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk from the Frontline. O'Reilly Edition, 2014.

Reference Text books:

1. Jure Leskovek, AnandRajaraman and Jerrey Ullman. Mining of Massive Datasets. v2.1 Cambridge University Press. 2014.
2. Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2013.
3. Foster Provost and Tom Fawcett. Data Science for Business: What You Need to Know about Data Mining and Data-analytic Thinking. ISBN 1449361323. 2013.

Course Outcomes:

On completion of the course the student should be able to	Blooms Level of Learning
1. Understand the key concepts and notations in data science	L2
2. Implement the standard methods of data analysis, information retrieval and Machine learning.	L3
3. Demonstrate the problem of knowledge extraction as combinations of data filtration, analysis and exploration methods.	L3
4. Learn and distinguish the fundamental techniques for making personalized recommendations through nearest-neighbor techniques.	L4
5. Understand the importance of data visualization and the design and use of many visual components for effective communications and applications of data visualization in various domains.	L5, L6

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A58BT.1	3	-	-	-	-	-	-	-	3	-	-	3	3	-	-
19A58BT.2	3	3	3	-	3	-	-	-	3	-	3	3	3	3	3
19A58BT.3	3	3	3	-	3	-	-	-	3	-	3	3	3	3	3
19A58BT.4	3	-	3	-	3	-	-	-	3	-	-	3	3	3	3
19A58BT.5	3	3	3	-	3	-	-	-	3	-	3	3	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Software Architecture
 Category : PE
 Course Code : 19A58CT
 Year : IV B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

14. Learn the fundamentals concepts of the software architecture.

- Acquire the knowledge of various architectural styles.
- Understand the Architectural structures of Shared Information System.
- Identify Formal Approaches to software architectures.
- Analyze implementation of Architectural Design Tools and providing solutions to real world software design problems.

Unit 1 : *Introduction to Software Architecture* 9

An Engineering Discipline for Software, Status of S/W Arch. Architecture Business Cycle, Where do Architectures come from. Software Processes and the Architecture Business Cycle, Features of Good Architecture.

Unit 2 : *Architecture Styles* 9

Pipes and Filters, Data Abstraction and Object Oriented organization, Even-based Implicit Invocation, Layered Systems, Registers, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

Unit 3 : *Shared Information Systems* 9

Database Integration, Integration in Software Development Environments, Architectural Structures for Shared Information Systems.

Architectural Design Guidance: Guidance for User Interface Architectures, Case Study in Inter-Operability: World Wide Web.

Unit 4 : *Formal Models and Specifications* 9

Formalizing the Architecture of a Specific System, Architectural Style, Architectural Design Space, and Case Study of an Industry Standard Computing Infrastructure: CORBA.

Linguistic Issues: Requirements for Architecture-Description Language

Unit 5 : *Tools for Architectural Design* 9

A Universal Connector Language, Exploiting Style in Architectural Design Environment.

Software Product Lines: Overview, What makes software product lines work?, Architectures for Product Line, What makes Software Product Lines Difficult?

Prescribed Text books:

1. Mary Shaw, David Garlan, "S/W Arch. Perspective: on an Emerging Discipline", 1996, PHI.
2. Len Bass, Paul Elements, Rick Kazman, "Software Architecture in Practice", 1998, PEA.

Reference Text Books:

1. Garmus, Herros, "Measuring the Software Process: A Practical Guide to Functional Measure", 1996, PHI.

2. Carleton, "Meas. Software Process: Stat. Proce. Cont. for Software process Improvements", 1999, PEA.
3. W.Humphery, "Introduction to Team Software Process", 2002, PEA.
4. Peters, "Software Design: Methods and Techniques", 1981, Yourdon.
5. Gamma, Shaw, "An Introduction to Software Architecture", 1995, World Scientific.
6. Shaw, gamma, "Software Architecture", 1996, PHI.

Course Outcomes:

Student will be able to	Blooms Level of Learning
1. Understand the principles, techniques, and methods for design, analysis, and maintenance of software architectures	L1, L2
2. Choose the Architectural style for designing their software.	L1, L2
3. Integrate database with Software in Shared Environment and to do a case study in World Wide Web.	L1, L2,L3
4. Categorize the Architectural Style and Design that are suited for Specific system.	L1, L2
5. Use an Architectural Design Tools to improve System Quality.	L1,L2,L3

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A58CT.1	3	3	-	-	-	-	-	-	-	-	3	3	3	-	-
19A58CT.2	3	3	2	-	3	-	-	-	-	-	-	-	3	-	-
19A58CT.3	3	3	2	3	3	-	1	-	3	1	3	3	3	-	-
19A58CT.4	-	-	-	3	3	-	-	-	3	-	3	3	3	1	2
19A58CT.5	-	3	-	3	3	-	-	-	3	-	3	3	3	-	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : Wireless Sensor Networks
 Category : PE
 Course Code : 19A58DT
 Year : IV B. Tech.
 Semester : II Semester

Lecture Hours	Tutorial Hours	Practical	Credits
3	0	0	3

Course Objectives: This course will able to

- Understand the basic concepts of wireless sensor network (WSN) and its applications.
- Analyze different wireless technologies.
- Develop new frameworks/protocols/methods for WSN.
- Illustrate the working principles of a WSN

Unit 1 : Introduction and overview of Wireless Sensor Networks 9
 Background of Sensor Network Technology - Application of Sensor Networks - Basic overview of the technology - Basic Sensor Network Architectural Elements - Survey of Sensor Networks - Applications of Sensor Networks: Range of Applications - Examples of Category 2 WSN Applications - Examples of Category 1 WSN Applications - Taxonomy of WSN Technology.

Unit 2 : Basic Wireless Sensor Technology 9
 Sensor Node Technology - Sensor Taxonomy - WN Operating Environment - WN Trends - Wireless Transmission Technology and Systems: Radio Technology Primer - Propagation and Propagation Impairments - Available Wireless Technologies - Campus Applications - MAN/WAN Applications.

Unit 3 : Medium Access Control Protocols for Wireless Sensor Networks 12
 Fundamentals of MAC Protocols - Performance Requirements - Common Protocols - MAC Protocols for WSNs - Sensor-MAC Case Study - IEEE 802.15.4 LR - WPANs Standard Case Study -PHY Layer - MAC Layer. Routing Protocols for Wireless Sensor Networks: Data Dissemination and Gathering - Routing Challenges and Design Issues in Wireless Sensor Networks - Routing Strategies in Wireless Sensor Networks.

Unit 4 : Transport Control Protocols for Wireless Sensor Networks 12
 Traditional Transport Control Protocols - Transport Protocol Design Issues - Examples of Existing Transport Control Protocols - Performance of Transport Control Protocols - Middleware for Wireless Sensor Networks: WSN Middleware Principles - Middleware Architecture - Existing Middleware.

Unit 5 : Network Management for Wireless Sensor Networks 9
 Traditional Network Management Models - Network Management Design Issues - Example of Management Architecture: MANNA - Naming - Localization. Operating Systems for Wireless Sensor Networks: Design Issues - Examples of Operating Systems - Performance and Traffic Management: WSN Design Issues - Performance Modelling of WSNs - Case Study: Simple Computation of the System Life Span.

Prescribed Text books:

1. KazemSohraby, Daniel Minoli and TaiebZnati, Wireless Sensor Networks: Technology, Protocols, and Applications, John Wiley and Sons, 2011, ISBN: 9788126527304, 8126527307
2. Holger Karl and Andreas Willig, Protocols and Architectures for Wireless Sensor Networks, John Wiley and Sons, 2007, ISBN: 978-0471718161.

Reference Text Books:

1. WalteneousDargie, ChristianPoellabauer, Fundamentals of Wireless Sensor Networks: Theory and Practice, John Wiley and Sons, 2010, ISBN: 978-0-470-997659.
2. Jun Zheng, Abbas Jamalippur, Wireless Sensor Networks: A Networking Perspective, John Wiley and Sons, 2014, ISBN: 978-81-265-5124-8.

Course Outcomes:

Student will be able to

Blooms Level of Learning

- | | |
|-------------------------------------------------------------------------------|----|
| 1. Identify the important aspects of WSN and its benefits. | L1 |
| 2. Illustrate the working principles of a WSN. | L3 |
| 3. Demonstrate the applications of WSN and protocol working of WSN. | L2 |
| 4. Evaluate the performance of transport protocols, traffic management of WSN | L5 |
| 5. Analyze new frameworks/protocols/methods for WSN. | L4 |

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
19A58DT.1	3	-	3	-	-	-	-	-	-	-	-	-	3	-	-
19A58DT.2	-	3	3	3	-	-	-	-	-	-	-	-	3	-	2
19A58DT.3	3	-	3	3	-	3	-	-	-	-	-	-	3	-	2
19A58DT.4	3	3	-	3	-	3	-	-	-	-	-	-	3	-	-
19A58DT.5	3	3	-	3	-	3	-	-	-	-	-	-	3	-	-

PROGRAM OUTCOMES

A graduate of Computer Science & Engineering will have ability to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Understand the working of new hardware/software architectures and components and design solutions for real time problems.

PSO2: Model the computer-based systems and design algorithms that explore understanding of the trade-offs involved on design choices.

PSO3: Design, develop and test system software and application software for distributed and centralized computing environments to varying domain and platforms.