

AL-FALAH UNIVERSITY

DEPARTEMENT OF COMPUTER SCIENCE & ENGINEERING

SYLLABUS

B. Tech 6th Semester

Choice Based Credit System Scheme (CBCS)



(Applicable from Session 2015-16)

Al-Falah University, Faridabad-121004
Department of Computer Science & Engineering

AL-FALAH UNIVERSITY

Scheme of Studies & Examination Bachelor of Technology (Computer Science & Engineering)

Semester – VI

S. No.	Course No.	Course Type	Subject	Teaching Schedule				Examination Schedule (Marks)				Credits
				L	T	P	Total	Marks of Class work	Theory	Practical	Total	
1	CSE-302	PC-1	Software Engineering	3	1	-	4	60	90	-	150	3
2	CSE-304	PC-2	Artificial Intelligence & Applications	3	1	-	4	60	90	-	150	3
3	CSE-306	PC-3	Computer Networks	3	1	-	4	60	90	-	150	3
4	CSE-308	PC-4	Analysis & Design of Algorithms	3	1		4	60	90	-	150	3
5	-----	PE-II	Program Elective - II	3	1	-	4	60	90	-	150	3
6	-----	OE-II	Open Elective - II	3	1	-	4	60	90	-	150	3
7	CSE-316	Lab-1	Intelligent System Lab	-	-	2	2	60	-	40	100	2
8	CSE-318	Lab-2	Computer Network Lab	-	-	2	2	60	-	40	100	2
9	CSE-320	Lab-3	Colloquium/Seminar-I	-	-	2	2	60	-	40	100	1
			TOTAL	18	6	6	30	530	540	130	1200	23

- PC – Program Core
- PE – Program / Departmental Elective
- OE – Open Elective
- C.S – Compulsory Subject

Program Electives:

CSE-310 C-Sharp and .NET Framework
CSE-312 System & Network Administration
CSE-314 Mobile & Persuasive Computing

Open Electives:

EC-318 Fuzzy & Neural Network
EC-308 Digital system Design
MGT-304 Human Resource Management
MGT-302 Customer Relationship Management
ME-314 Element of Mechatronics Systems

CSE-302: SOFTWARE ENGINEERING

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

NOTE: The question paper will have nine questions in all. Question number-1 will be compulsory and will be of conceptual nature covering the entire syllabus. There after there will be four sections and each section will have two questions. Candidates will be required to attempt at least one question from each section. All questions carry equal marks and the duration of examination will be 2.30 hrs.

COURSE OBJECTIVES:

- a) To understand the evolution of software engineering.
 - b) To understand the models used in software industry.
 - c) To understand the concepts of analysis and system design.
 - d) To understand the issues of testing in software engineering process.
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Unit-I

Introduction: The process, software products, evolving role of software, Software life cycle models, Software Characteristics, Applications and crisis.

Software project management: Project management concepts, Project metrics, Project planning, project size estimation metrics, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

Unit-II

Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning, Software prototyping; Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: DFD, Behavioral Modeling; The mechanics of structured analysis: Creating ER diagram, data flow model, control flow model, the control and process specification; The data dictionary.

System Design: Design concepts and principles: the design process: Design and software quality, Design concepts: Abstraction, refinement, modularity, software architecture, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity.

Unit-III

Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs, architectural complexity; Mapping requirements Into software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design. Testing and maintenance:

Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, white box testing, Black box testing, testing for specialized environments, architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering, reverse engineering, restructuring, forward engineering.

Unit-IV

Software Reliability and Quality Assurance: Software quality assurance, SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA;

Software reliability: Measures of reliability and availability The ISO 9000 Quality standards: The ISO approach to quality assurance systems, Software Configuration Management.

Text Book:

- A Practitioner's Approach, Roger S. Pressman, MGH.

References:

- Fundamentals of software Engineering, Rajib Mall, PHI
- Software Engineering by Ian Somerville, Pearson Edu, 5th edition, 1999, AW,
- Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 JW&S.
- An Integrated Approach to software engineering by Pankaj jalote , 1991 Narosa,

CSE-304: ARTIFICIAL INTELLIGENCE & APPLICATIONS

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

- a) To understand the evolutionary concepts of artificial intelligence.
 - b) To study search technique in AI.
 - c) To understand the programming languages used in AI.
 - d) To understand the principles of natural language.
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Unit-I

Foundational issues in intelligent systems: Foundation and history of AI, AI agents, AI problems and techniques, Problem spaces and searches. **Blind search strategies:** Breadth first search and Depth first search.

Heuristic search techniques: Hill climbing, Generate and test, Best First Search, Problem Reduction, Constraint Satisfaction, Mean-Ends Analysis, A *and AO* algorithm. **Game playing:** Min max algorithms, alpha beta pruning.

Unit-II

Knowledge representation: Representations and Mappings, Approaches to Knowledge representation, Knowledge representation method, Propositional Logic, Predicate logic, Representing Simple facts in Logic, Representing Instances and Isa relationships, Resolution, Forward and backward chaining and rule based deduction systems.

Introduction to AI Programming Language: Introduction to Turbo Prolog, Prolog variables, Simple Input and Output Basic Rules of Recursion, Arithmetic Operations.

Unit-III

Slot and Filler Structures: Weak Structures, Semantic Networks, Frames, Strong Structures, Reasoning under uncertainty, Baye's probabilistic interferences and Dempster shafer theory.

Planning: Component of a planning system, Goal state planning, Nonlinear planning, Hierarchical planning, planning in situational calculus, partial order planning algorithm,

Unit-IV

Learning: What is learning, Rote Learning, Learning by taking advice, discovery as learning, Learning in problem solving, Learning from examples, Learning by analogy, explanation based learning, overview of neural network.

Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

Text Book:

- Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.
- Artificial Intelligence, Elaine Rich and Kevin Knight, 1991, TMH.
- Artificial Intelligence-A modern approach, Stuart Russel and peter norvig, PHI.
- Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3rd Ed.

CSE-306: COMPUTER NETWORKS

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

NOTE: The question paper will have nine questions in all. Question number-1 will be compulsory and will be of conceptual nature covering the entire syllabus. There after there will be four sections and each section will have two questions. Candidates will be required to attempt at least one question from each section. All questions carry equal marks and the duration of examination will be 2.30 hrs.

COURSE OBJECTIVES:

- a) To study basics of Computer Network.
 - b) To understand the working of different protocols used in networks.
 - c) To study standards used in wireless networks.
 - d) To understand the network policies.
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Unit-I

OSI Reference Model and Network Architecture: Introduction to Computer Networks, ARPANET, Internet, Private Networks; Network Topologies: Bus, Star, Ring, Hybrid, Tree, and Complete, Irregular Topology.

Types of Networks: Local Area Networks, Metropolitan Area Networks, Wide Area Networks. Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

Unit-II

TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol, User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing.

Internet Control Protocols: ARP, RARP, ICMP, Application Layer, Domain Name System, Email - SMTP, POP, IMAP; FTP, NNTP, HTTP and IPv6.

Unit-III

Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB).

Unit-IV

Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay and Wireless Links.

Introduction to Network Management: Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure.

Text Book:

- Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

Reference Books:

- Data Communications, Computer Networks and Open Systems Halsall Fred, Addison Wesley.
- Computer Networks - A System Approach, Larry L. Peterson & Bruce S. Davie, 2nd Edition
- Computer Networking - ED Tittel, 2002, T.M.H.

CSE-308: ANALYSIS & DESIGN OF ALGORITHMS

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

- a) To study the fundamentals of algorithm designing.
 - b) To understand the methods introduced in algorithm designing.
 - c) To study different approaches used to solve real world problems.
 - d) To understand the behavior of NP problems.
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Unit-I

Brief Review of Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity.

Divide and Conquer: General method, binary search, merge sort, quick sort, selection sort, Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.

Unit-II

Greedy Method: General method, knapsack problem, job sequencing with deadlines, minimum spanning trees, single source paths and analysis of these problems.

Dynamic Programming: General method, optimal binary search trees, O/I knapsack, the traveling salesperson problem.

Unit-III

Back Tracking: General method, 8 queen's problem, graph coloring, Hamiltonian cycles, analysis of these problems.

Branch and Bound: Method, O/I knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations.

Unit-IV

NP Hard and NP Complete Problems: Basic concepts, Cook's theorem, NP hard graph and NP scheduling problems some simplified NP hard problems.

Text Books:

- Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni, 1978, Galgotia Publ.,
- Introduction To Algorithms, Thomas H Cormen, Charles E Leiserson And Ronald L Rivest: 1990, TMH

Reference Books:

- The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., Addison Wesley.
- Algorithms-The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons..

CSE-310: C-SHARP and .NET FRAMEWORK

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

- a) To study the fundamentals of C# programming.
 - b) To understand the fundamentals of .net framework.
 - c) To study the data handling techniques using XML.
 - d) To understand the working of Web services.
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Unit-I

Review of OOP Concepts - Overview of .NET Framework - Basic Elements of C# - Program Structure and simple Input and Output Operations – Operators and Expressions – Statements – Arrays and Structures.

Inheritance - Namespace – Polymorphism – Interface and Overloading – Multiple Inheritance – Property – Indexes – Delegates – Publish/Subscribe Design Patterns- Operator Overloading-Method Overloading

Unit-II

C# Concepts for creating Data Structures - File Operation – File Management systems.

Stream Oriented Operations- Multitasking – Multithreading – Thread Operation – Synchronization.

Unit-III

Working with XML – Techniques for Reading and Writing XML Data - Using XPath and Search XML - ADO.NET Architecture – ADO.NET Connected and Disconnected Models.

XML and ADO.NET – Simple and Complex Data Binding– Data Grid View Class.

Unit-IV

Application Domains – Remoting – Leasing and Sponsorship - .NET Coding Design Guidelines –Assemblies – Security – Application Development.

Web Services - Building an XML Web Service - Web Service Client – WSDL and SOAP , Web Service with Complex Data Types – Web Service Performance.

Text Book:

1. S. Thamarai Selvi and R. Murugesan “A Textbook on C# “, Pearson Education, 2003.
2. Stephen C. Perry “Core C# and .NET”, Pearson Education, 2006.

Reference Books:

1. Jesse Liberty, “Programming C#”, Second Edition, O’Reilly Press, 2002.
2. Robinson et al, “Professional C#”, Fifth Edition, Wrox Press, 2002.
3. Herbert Schildt, “The Complete Reference: C#”, Tata McGraw Hill, 2004.
4. Andrew Troelsen, “C# and the .NET Platform”, A! Press, 2003.

CSE-312: SYSTEM & NETWORK ADMINISTRATION

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

- a) To study the fundamentals of network administrative issues.
 - b) To understand the algorithms and approaches used in cryptography.
 - c) To study the concepts of hosting administration
 - d) To have practical approach of Linux related to network management and scripting purpose.
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Unit-I

Network Administration: Introduction to networks, Install and administer network services. Protect and secure users' information on computer systems. Use the command line interface for system administration. Demonstrate strategies for planning/designing systems. Install and manage disks and file systems.

Network troubleshooting and administration, Mail Server and their respective configuration settings. Various Interconnecting Devices: Steps followed in establishing a network.

Unit-II

Security: Concept of Security, its need, issues, cryptography techniques: ciphers, substitution cipher, transposition, symmetric key algorithms, Asymmetric key algorithms and public key algorithms.

Authentication algorithms, VAN, Digital Signatures, IDS, Firewall. Types of attacks, access control list, filtering rules.

Unit-III

Host Administration: Introduction to system Administration, installation of Linux, windows OS, formatting file systems like NTFS etc.

Bootting process in various OS, User accounts, group accounts, passwords, shadow passwords, directory structure of analysis of host machine and how to improve the systems performance.

Unit-IV

Introduction to Linux: Linux Features, Linux File System, Root privileges, Linux Kernel, User administration.

Basic Knowledge of Linux commands: Administration and Networking based commands, File system securities.

Text Book:

- The Unix programming Brain Kemighen & Rob Pike environment
- Design of the Unix Maurice Bach operating system

Reference Books:

- Advanced Unix programmer's Stephen Prato Guide
- Unix Concepts and Sumitabha Das : applications-Featuring SCO Unix and Linux

CSE-314: MOBILE & PERSUASIVE COMPUTING

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

- To study the fundamentals of mobile network related technologies.
 - To understand the Wireless network technologies.
 - To understand the protocols related to various layers used in internet models.
 - To know the fundamentals of persuasive computing.
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Unit-I

Mobile Networks

Cellular Wireless Networks – GSM – Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security – GPRS.

Unit-II

Wireless Networks

Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services – Network – HyperLAN – Bluetooth- Wi-Fi – Wi-MAX, networking, security and link management.

Unit-III

Routing

Mobile IP – DHCP – AdHoc Networks– Proactive and Reactive Routing Protocols –Routing in unicast and multicast environment.

Transport and Application Layers

Mobile TCP– WAP – Architecture – WWW Programming Model– WDP – WTLS – WTP – WSP – WAE – WTA Architecture – WML – WML Scripts.

Unit-IV

Persuasive Computing

Pervasive computing infrastructure-applications- Device Technology - Hardware, Human-machine Interfaces, Biometrics, and Operating systems– Device Connectivity – Protocols, Security, and Device Management- Pervasive Web

Application architecture- Access from PCs and PDAs - Access via WAP

Text Book:

1. Jochen Schiller, “Mobile Communications”, PHI, Second Edition, 2003.
2. Jochen Burkhardt, Pervasive Computing: Technology and Architecture of Mobile Internet Applications, Addison-Wesley Professional; 3rd edition, 2007

Reference Books:

1. Frank Adelstein, Sandeep KS Gupta, Golden Richard, Fundamentals of Mobile and Pervasive Computing, McGraw-Hill

ME-314: ELEMENT OF MECHATRONICS SYSTEMS

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

- Understand the concept of Mechatronics and identify the different Mechatronics systems that are encountered in real life.
- Develop a simulation model for simple physical systems and explain the Mechatronics design process.
- Identify and describe the different types of actuators used in Mechatronics systems.
- Describe the working principle of PLC used in Mechatronics system.

Unit-I

Mechatronics and sensor transducers: Mechatronics – its concept, evolution and control; Key elements of Mechatronics and their functions; Measurement system, control system, servo mechanism and regulator; Sequential control sensors and transducers; Sensing equipment for: displacement and position/proximity, motion and velocity, force and torque, fluid pressures and fluid flow, liquid level and temperature etc; Signal conditioning equipment – amplification modulation, filtration and protection; Data acquisition and data presentation systems – CRO, printers, magnetic recorders, light indicator, liquid crystal display and data loggers.

Number system and logic gates: Integrated/digital circuits and their characteristics; Boolean algebra; Number system – binary, octal, hexadecimal and binary coded decimal; Logic gates – AND, OR, NOT, NAND, NOR and XOR; Sequence logic flip flop system, JK flip flop and D flip flop.

Unit-II

Pneumatic and hydraulic systems: Principle and working of industrial hydraulic and pneumatic systems; Key elements and their functions; Operating principles and characteristics of direction control, pressure control and process control valves; Cylinders and their sequencing.

Mechanical and electrical actuators: Motion and its types; Operational aspects of mechanical systems involving linkages, Chains, cams, bearings, ratchets and pawl, belt and chain drives; Gears and gear trains.

Purpose and operation of electrical devices such as relays, thyristors, bipolar transistors and solid state switches; Construction and operation of AC induction motor, DC motor, servomotor and stepper motor.

Unit-III

System modeling and performance: An engineering system and its types – rotational, translation, electro – mechanical and hydraulic – mechanical systems; Order of a system; Systems in series and systems with feedback; Transfer function and the response of first and second order systems to simple inputs using Laplace transform.

Control action and controllers: Functional operation of control; Basic control actions – two position, proportional, integral and derivative control; Case study – control of level of water in pipe – tank system using proportional, integral or derivative control; Multiple controllers:- Proportional integral (PI), proportional derivative (PD) and proportional plus derivative plus integral (PDI) control actions; Factors affecting choice of control action.

Unit-IV

Programmable logic controller: Notable features and function of a microcomputer, a microprocessor and a microcontroller; Programmable logic controller (PLC):- Basic structure, programming units, memory, input/output models; Timers:- Internal relays, counters and shift registers; Master and jump control; Date handling; Analog input/output; PLC selection criterion and application.

Design and Mechatronics: Design process, Traditional and Mechatronics design; Design solutions for following devices: Automatic washing machine, automatic car parking, automatic camera, wind screen wiper motion, timed switches, bar code recorder, and bathroom scale, pick and place robot, engine management systems.

Text Book:

1. Mechatronics W Bolton Pearson Education Asia, New Delhi.
2. Mechatronics System Design Devdas Shetty and Akolk Richard Vikas Publishing House, Noida

MGT-304: HUMAN RESOURCE MANAGEMENT

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

- To provide a framework for understanding the HR policies and their impact on employees.
 - To cover the entire range of HR functions and the strategic role of HRM in business.
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Unit-I

Human Resource Management: Evolution, Functions, HRM Policies & Principles, System Approach to Human, Resource Management; HR Relationship with other Departments; e-HRM, Human capital Management, Environment of HRM– Internal & external forces affecting the HR function. Global HRM

Unit-II

Job Analysis, Job Enrichment and Job Enlargement: Methods for Collecting Job Analysis Information.
Recruitment & Selection Process: Planning and Forecasting, Effective Recruiting, Internal and External Sources of Candidates, Recruiting a Diverse Workforce, Employee Testing and Selection.

Unit-III

Training and Development: T&D Process, Methods of Employee Training, Methods of Executive Development, Evaluating the Training Effort. Performance Appraisal Methods-Meaning, concept and significance of performance appraisal.

Unit-IV

Performance Management: Meaning, Concept and significance of performance management Components of Performance Management, Performance Counseling.

Suggested readings:-

1. Aswathapa, K. (2008) 5th ed. *Human Resource Management*, Tata McGraw Hill.
2. Dipak Kumar Bhattacharyya, *Human Resource Management*, Excel Books.
3. French, W.L. (1990), *Human Resource Management*, 4th ed., Houghton Mifflin, Boston.
4. H.J. Bernardin, *Human Resource Management*, Tata McGraw Hill, New Delhi, 2004.
5. Ivancevich, JM (2008), *Human Resource Management*, Tata McGraw Hill.

MGT-302: CUSTOMER RELATIONSHIP MANAGEMENT

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

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COURSE OBJECTIVES:

Objective of this course is to develop in students an ability to manage effective relationships with customers in arrange of business settings.

Unit-I

Introduction to CRM: Definition, Scope, Evolution and Transformation of Customers, Touch Point Analysis. Customer Value: Customer Relationship Styles, Types of Customer Value, Value Co-creation.

Unit-II

Analyzing Profitability of Customers: Lifetime Customer Value, Base Profit Analysis, Value Chain Analysis, Customer Defection. Customer Retention: Importance, Stages, Measurement, Customer Expectations: Managing and Delivering. Closed Loop Marketing, Data Mining, Cross-selling/up selling.

Unit-III

Technology for Customer Relations: Contact centre Technology, Front Desk Management Technology, Customer Data Management. e-CRM and its importance; Recognizing Barriers to Internet Adoption. Managing Customer Relationship: Stages, Techniques to Manage Relations, Customer Experience Management. Creating a Customer Profile; Knowing your Customers; Segmenting & Targeting Customers; Tools used for Segmenting & Targeting Customers.

Unit-IV

CRM Measurement: CRM Metrics, Loyalty Programs, Customer Indices: Composite and Values, Application of Metrics. Customer Privacy: Need, importance and elements. Emerging Trends in CRM, Sales Force Automation.

Suggested Readings:

1. G Shainesh, Jagdish N Sheth, *Customer Relationship Management: A Strategic Perspective*
2. Buttle, Francis, *Customer Relationship Management – Concept and Tools*, Elsevier Butterworth – Heinemann, Oxford, UK
3. Dyche, Jill, *The CRM Handbook – A Business Guide to Customer Relationship Management*, Pearson Education, New Delhi
4. Greenlers, Paul, *CRM at the Speed of Light*, Tata McGraw Hill Publishing Ltd., New Delhi
5. Anderson, Kristen, and Carol J Kerr, *Customer Relationship Management*, Tata McGraw Hill

EC-318: FUZZY LOGIC & NEURAL NETWORK

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

NOTE: The question paper will have nine questions in all. Question number-1 will be compulsory and will be of conceptual nature covering the entire syllabus. There after there will be four sections and each section will have two questions. Candidates will be required to attempt at least one question from each section. All questions carry equal marks and the duration of examination will be 2.30 hrs.

COURSE OBJECTIVES:

- Understand fundamental of fuzzy set theory & fuzzy logic controls
 - Understand adaptive fuzzy systems
 - Understand the feature of Artificial Neural Networks, multilayer perceptrons, Back propagation algorithm etc.
 - Understand mapping & Recurrent Net Works.
-

Unit-I

FUZZY SET THEORY AND FUZZY LOGIC CONTROL: Basic concepts of fuzzy sets ,Operations on fuzzy sets ,Fuzzy relation equations , Fuzzy logic control , Fuzzification, Defuzzification, Knowledge base, Decision making logic Membership functions , Rule base.

Unit-II

ADAPTIVE FUZZY SYSTEMS : Performance index, Modification of rule base Modification of member ship functions, simultaneous modification of rule base and membership functions , Genetic algorithms Adaptive fuzzy system, Neuro fuzzy systems.

Unit-III

ARTIFICIAL NEURAL NETWORKS: Introduction, history of neural networks, multilayer perceptrons, Back propagation algorithm and its variants, Different types of learning, examples

Unit-IV

MAPPING AND RECURRENT NET WORKS: Counter propagation, Self organisation Map, Cognitron and Neocognitron, Hopfield Net, kohonnen Nets, Grossberg Nets- Art-I reinforcement learning

TEXT BOOKS:

Neural networks and Fuzzy logic by Vallum B.R and Hayagriva V.R published by BPB Publications , New Delhi

REFERENCE BOOKS:

- Neural Networks for control by Millon W.T , Sutton R.S and Werbos P.J published by MIT Press
- Fuzzy sets and Fuzzy logic by Klir ,G.J and Yuan B.B published by Prentice Hall
- Neural Networks and Fuzzy systems by Koskopublished by PHI

EC-308: DIGITAL SYSTEM DESIGN

L T P
3 1 0

Credits: 3

Duration of Exam: 2½ Hrs.

Internal: 60 Marks

External: 90 Marks

Total: 150 Marks

NOTE: The question paper will have nine questions in all. Question number-1 will be compulsory and will be of conceptual nature covering the entire syllabus. There after there will be four sections and each section will have two questions. Candidates will be required to attempt at least one question from each section. All questions carry equal marks and the duration of examination will be 2.30 hrs.

COURSE OBJECTIVES:

- Use some of the modern CAD tools to help with the design.
 - Implement designs using programmable logic as FPGAs
 - Understand digital building blocks, such as memory chips, processing elements, arithmetic circuits etc.
 - Interface to processors and computers
 - Deal with testing of complex systems
 - Use of the VHDL language for representation of digital signals.
-

Unit-I

INTRODUCTION: Introduction to Computer-aided design tools for digital systems. Hardware description languages; introduction to VHDL data objects, classes and data types, Operators, Overloading, logical operators. Types of delays Entity and Architecture declaration. Introduction to behavioral dataflow and structural models.

Unit-II

VHDL STATEMENTS: Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements.

Subprograms: Application of Functions and Procedures, Structural Modeling, component declaration, structural layout and generics.

Unit-III

COMBINATIONAL & SEQUENTIAL CIRCUIT DESIGN: VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders , code converters, comparators, implementation of Boolean functions etc.

VHDL Models and Simulation of Sequential Circuits Shift Registers, Count\ers etc.

Unit-IV

DESIGN OF MICROCOMPUTER & PROGRAMMABLE DEVICE: Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL Programmable logic devices: ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA.

Design implementation using CPLDs and FPGAs

TEXT BOOKS:

- A VHDL Primer by J. Bhasker published by Prentice Hall 1995
- Fundamentals of Digital Logic with VHDL Design by Stephen Brown and Zvonko Vranesic published by TMH
- Modern Digital Electronics by R.P. Jain published by TMH
- Digital System Design using VHDL by Charles. H.Roth, Larry L Kinney published by PWS

REFERENCE BOOKS:

- Digital design by Peter J. Ashenden published by Elsevier, Morgan Kauffman

CSE-316: AI LAB

L T P C
0 0 2 2

Internal: 60 Marks
External: 40 Marks
Total: 100 Marks

Duration of Exam: 2 Hrs.

LIST OF PRACTICALS

1. Turbo Prolog features and format.
2. WAP using variables in Prolog.
3. WAP for Usage of rules in Prolog.
4. WAP for using Input, Output and fail predicates in Prolog. Display:
 - (i) List of married & unmarried employees
 - (ii) List of male & female employees
 - (iii) List of employees for given job location

(2) Create a small set of facts and rules on who is the ancestor of whom. Display:

 - (i) Who is ancestor of given person?
 - (ii) Complete list i.e who is ancestor of whom
5. Write programs for studying Usage of arithmetic operators in Prolog.
 - (1) Accept name of the student, Rollno, his/her subject name, maximum marks and obtained marks in the subject. (Take marks of at least 6 subjects).
Compute the percentage of a student.
Display his result with other information.
 - (2) Accept department, designation, name, age, basic salary, house rent allowance (HRA) of an employee.
Compute dearness allowance (DA) which is 15% of basic salary.
Determine the gross salary (basic salary + HRA + DA) of the employee.
Display all information of the employee (Generate Payslip).
6. WAP to study usage of cut, not, fail predicates in Prolog. Write a Prolog program having facts in clauses section for predicate student (studentname, branchname). Display:
 - (i) List of all students
 - (ii) List of students for given specific branch.
 - (iii) List of students excluding specific branch
7. WAP to study usage of Recursion in Prolog. (1) Write program which finds and display factorial of a given number.
(2) Write program which display Fibonacci series.
8. WAP to study usage of logical, arithmetic, string operators in Prolog
 - (1) Write a program which finds and displays maximum number and minimum number from three given numbers.
 - (2) Write a program which accepts integer number as an input and displays its square. It should also find its positive square root value, if its square root is integer, otherwise display 'NA'.
 - (3) Write a program to find substring from a given string. The substring should start from 1st location of source string and should contain the entered number of characters from the source string.
9. WAP for studying usage of compound object and list in Prolog.
10. WAP for studying usage of Dynamic database in Prolog.

CSE-318: COMPUTER NETWORK LAB

L T P C
0 0 2 2

Internal: 60 Marks
External: 40 Marks
Total: 100 Marks

Duration of Exam: 2 Hrs.

This course provides students with hands on training regarding the design, troubleshooting, modeling and evaluation of computer networks. In this course, students are going to experiment in a real test-bed networking environment, and learn about network design and troubleshooting topics and tools such as: network addressing, Address Resolution Protocol (ARP), basic troubleshooting tools (e.g. ping, ICMP), IP routing (e.g. RIP), route discovery (e.g. traceroute), TCP and UDP, IP fragmentation and many others.

Student will also be introduced to the network modeling and simulation software (ex. Cisco packet tracer and GNS3) and they will have the opportunity to build some simple networking models using the tool and perform simulations that will help them evaluate their design approaches and expected network performance. They have the opportunity to build some simple networking models using the tool and perform simulations that will help them evaluate their design approaches and expected network performance.

CSE-320: SEMINAR / COLLOQUIUM

L T P C
0 0 2 1

Internal: 60 Marks
External: 40 Marks
Total: 100 Marks

Duration of Exam: 2 Hrs.

Students are required to appear in a seminar/colloquium in which he/she will present some technical topic related to any technology (of his/her branch). Student can also refer to latest trends of that technology going in industry.