Distributed System

Subject Code		:

IA Marks		: 25

No. of Lecture Hrs/Week		: 04

Exam Hours		: 03

Total no. of Lecture Hrs.		: 52

Exam Marks		: 100

PART - A

Unit - 1

Characterization of distributed systems: Introduction, Examples of distributed systems, Resource sharing and the web, Challenges.

6 Hours

Unit - 2

System models: Introduction, Architectural models, Fundamental mode.

6 Hours

Unit - 3

Interprocess communication: Introduction, The API for the internet protocols, External data representation and marshalling, Clint-server communication, Group communication.

8 Hours

Unit - 4

Distributed objects and remote invocation: Introduction, Communication between distributed objects, Remote procedure call, Events and notifications.

6 Hours

PART - B

Unit - 5

Security: Introduction, Overview of security technique cryptographic algorithms, Digital signature, Cryptography progrmatics.

7 Hours

Unit - 6

Time & Global states: Introduction, Clocks, Events, Process states, Synchronizing physical clocks, Global states, Distributed debugging.

7 Hours

Unit - 7

Coordination and Agreement: Distributed mutual exclusion, Elections, Multicast communication.

7 Hours

Unit - 8

CORBA case study: Introduction, CORBA RMI, CORBA Services.

5 Hours

Text book:

1. **"Distributed Systems, Concepts & Design"**, George Coulouris, Jeam Dollimore, Tim Kindberg, fourth edition, 2006. Pearson education.

Reference book:

1. **"Distributed System Architecture, a Middleware Approach"** Arno puder, Kay Romer, Frank Pilhofer, Morgan Kaufmann publishers.

Network security

Subject Code		:

IA Marks		: 25

No. of Lecture Hrs/Week		: 04

Exam Hours		: 03

Total no. of Lecture Hrs.		: 52

Exam Marks		: 100

PART - A

Unit - 1

Services, mechanisms and attacks, The OSI security architecture, A model for network security.

3 Hours

Unit - 2

Symmetric Ciphers: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Simplified DES, Data encryption standard (DES), The strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles and Modes of Operation, Evaluation Criteria for Advanced Encryption Standard, The AES Cipher.

9 Hours

Unit - 3

Principles of Public-Key Cryptasystems, The RSA algorithm, Key Management, Diffie - Hellman Key Exchange, Elliptic Curve Arithmetic, Authentication functions, Hash Functions.

8 Hours

Unit - 4

Digital signatures, Authentication Protocols, Digital Signature Standard.

7 Hours

PART - B

Unit - 5

Web Security Consideration, Security socket layer (SSL) and Transport layer security, Secure Electronic Transaction.

6 Hours

Unit - 6

Intruders, Intrusion Detection, Password Management.

6 Hours

Unit - 7

Malicious software: Viruses and Related Threats, Virus Countermeasures.

6 Hours

Unit - 8

Firewalls Design Principles, Trusted Systems.

7 Hours

Text book:

1. **Cryptography and Network Security**, William Stalling, Pearson Education, 2003.

Reference books:

1. **Cryptography and Network Security**, Behrouz A. Forouzan, TMH, 2007.
2. **Cryptography and Network Security**, Atul Kahate, TMH, 2003.

Internet Engineering

Subject Code		:

IA Marks		: 25

No. of Lecture Hrs/Week		: 04

Exam Hours		: 03

Total no. of Lecture Hrs.		: 52

Exam Marks		: 100

PART - A

Unit - 1

Introduction: Communication model, Communication software, and communication protocol: Representation, Development methods, Protocol engineering process. NETWORK REFERENCE MODEL
:
Layered architecture, Network services and interfaces, protocol functions, OSI model, TCP/IP protocol suite, Application protocols.

7 Hours

Unit - 2

Protocol Specification: Communication service specification, Protocol entity specification, Interface specifications, Interactions, Multimedia protocol specifications, Internet protocol specifications.

6 Hours

Unit - 3

Specification And Description Language (SDL): A protocol specification language: SDL.

6 Hours

Unit - 4

Examples of SDL based protocol specifications, Other protocol specification languages. Protoc ol Verification And Validation,
Protocol verification, Verification of a protocol using finite state machines.

6 Hours

PART – B

Unit - 5

Protocol validation, Protocol design errors, and protocol validation approaches, SDL based protocol verification, SDL based protocol validation.

7 Hours

Unit - 6

Protocol Conformance Testing: Conformance testing methodology and framework, Conformance test architectures, Test sequence generation methods, Distribute architecture by local methods, Conformance testing with TTCN, Conformance testing of RIP, Multimedia applications testing, SDL based tools for conformance testing.

7 Hours

Unit - 7

Protocol Performance Testing: SDL based performance testing of TCP, OSPF, Interoperability testing, SDL based interoperability testing of CSMA/CD and CSMA/CA protocol using bridge, Scalability testing.

7 Hours

Unit - 8

Protocol synthesis: Synthesis methods, interactive synthesis algorithms, automatic synthesis algorithm, automatic synthesis of SDL from MSC protocol re synthesis.

6 Hours

Text book:

1. **Communication Protocol Engineering**, P. Venkatarm and S. S. Manvi, PHI, 2004.

References books:

1. **The Internet and its Protocols**, Adrian Farrel, Elsevier, 2006.

2. **TCP/IP Protocol Stack**, B A Forouzan, TMH, 2006.

Biomedical Signal Processing

Subject Code		:

IA Marks		: 25

No. of Lecture Hrs/Week		: 04

Exam Hours		: 03

Total no. of Lecture Hrs.		: 52

Exam Marks		: 100

PART - A

Unit - 1

Introduction to Biomedical Signals: The nature of Biomedical Signals, Examples of Biomedical Signals, Objectives and difficulties in Biomedical analysis.

5 Hours

Unit - 2

Electrocardiography: Basic electrocardiography, ECG lead systems, ECG signal characteristics.

5 Hours

Unit - 3

Basics of Digital Filtering: Digital filters, the Z-transform, elements of digital filter, types of digital filters, transfer function of a difference equation, the z-plane pole-zero plot, the rubber membrane concept.

6 Hours

Unit - 4

Adaptive Filters: Principal noise canceler model, 60-Hz adaptive canceling using a sine wave model, other applications of adaptive filtering.

8 Hours

Part - B

Unit - 5

Signal Averaging: Basics of signal averaging, signal averaging as a digital filter, a typical averager, software for signal averaging, limitations of signal averaging.

8 Hours

Unit - 6

Data Reduction Techniques: Turning point algorithm, Fan algorithm, Huffman coding.

8 Hours

Unit - 7

ECG QRS Detection: Power spectrum of the ECG, bandpass filtering techniques, differentiation techniques, template matching techniques, a QRS detection algorithm.

6 Hours

Unit - 8

ECG Analysis Systems: ECG interpretation, ST-segment analyzer, portable arrhythmia monitor. VLSI in Digital signal Processing: Digital signal processors, high performance VLSI signal processing, VLSI applications in medicine, VLSI sensors for biomedical signals, VLSI tools, Choice of custom, ASIC, or off-the-shelf components.

6 Hours

Text Book:

1. **Biomedical Digital Signal Processing** - Willis J. Tompkins, PHI, 2001.

Reference Book:

1. **Biomedical Signal Analysis** - Rangaraj M. Rangayyan John Wiley & Sons, Inc., 2002.

High Performance Computer Networks

Subject Code		:

IA Marks		: 25

No. of Lecture Hrs/Week		: 04

Exam Hours		: 03

Total no. of Lecture Hrs.		: 52

Exam Marks		: 100

PART - A

Unit - 1

History of Communication Networks, Networking principles, Future networks Internet, Pure TAM Network, Cable Network, Wireless.

6 Hours

Unit - 2

Network services and Layered Architecture: Applications, Traffic characterization and quality of services, Network services, High performance networks, Network Elements., Layered applications, Open data network model, Network architectures, Network bottlenecks.

7 Hours

Unit - 3

Internet and TCP/IP Networks: Multicast IP, Mobile IP, TCP and UDP, Applications, FTP, SMTP. Internet success and limitations, Performance of TCP/IP Networks, Performance of circuit switched networks.

7 Hours

Unit - 4

SONET, DWDM, FTH, DSL, Intelligent networks CATV.

6 Hours

PART - B

Unit - 5

ATM: Main features of ATM, Addressing, signaling and Routing, ATM header structure, ATM AAL, Internetworking with ATM.

7 Hours

Unit - 6

Wireless Networks: Link level design, Channel Access, Network design, Wireless networks today, Future networks, ad hoc networks, High speed Digital cellular, Home RF and Bluetooth.

6 Hours

Unit - 7

Control of networks, Objectives and methods of control, Circuit switched networks, Datagram Networks Network economics, Derived demand for network services, ISPs, subscriber demand

model, Empirical model.

7 Hours

Unit - 8

Optical networks: WDM systems, Optical cross connects, Optical LANs, Optical paths and networks.

7 Hours

Text Book:

1. **High Performance Communication Networks,** Warland and Varaiya: Morgan Kauffman/ Elsivier 2nd Edition 2000.

Reffrence Books:

1. **High-Speed Networks and Internet: Performance and Quality of service**, William

Stallings
, Pearson Edu., 2001.

2. **Building High-Speed Networks**, Tere Parnell, TMGH, 2000.

Fuzzy Logic

Subject Code		:

IA Marks		: 25

No. of Lecture Hrs/Week		: 04

Exam Hours		: 03

Total no. of Lecture Hrs.		: 52

Exam Marks		: 100

PART - A

Unit - 1

Introduction: Background, Uncertainty and imprecision, Statistics and random processes, Uncertainty in information, Fuzzy sets and membership, Chance versus ambiguity, Classical sets - operations on classical sets to functions, Fuzzy sets-fuzzy set operations, Properties of fuzzy sets. Sets as points in hypercubes.

7 Hours

Unit - 2

Classical relations and fuzzy relations: Cartesian product, Crisp relations-cardinality of crisp relations, Operations on crisp relations, Properties of crisp relations, Compositions, Fuzzy relations-cardinality of fuzzy relations, Operations on fuzzy relations, Properties of fuzzy relations, Fuzzy Cartesian product and composition, Non interactive fuzzy sets, Tolerance and equivalence relations-crisp equivalence relation, Crisp tolerance relation, Fuzzy tolerance, Max-min Method, other similarity methods.

7 Hours

Unit - 3

Membership functions: Features of the membership function, Standards forms and boundaries, fuzzification, Membership value assignments-intuition, Inference, Rank ordering, Angular fuzzy sets. Neural networks, Genetic algorithms, Inductive reasoning.

6 Hours

Unit - 4

Fuzzy-to-crisp conversions and fuzzy arithmetic: Lambda-cuts for fuzzy sets, Lambda-cuts for fuzzy relations, Defuzzification methods. Extension principle-crisp functions, Mapping and relations, Functions of fuzzy sets-extension principle, Fuzzy transform (Mapping), Practical considerations, and Fuzzy numbers Interval analysis in Arithmetic, Approximate methods of extension-vertex method, DSW algorithm, Restricted DSW algorithm, Comparisons, Fuzzy vectors.

6 Hours

PART - B

Unit - 5

Classical logic and fuzzy logic: Classical predicate logic-tautologies, Contradictions, Equivalence, Exclusive or and exclusive nor, Logical proofs, Deductive Inferences, Fuzzy logic, Approximate reasoning, Fuzzy tautologies, Contradictions, Equivalence and logical proofs, Other forms of the implication operation, Other forms of the composition operation.

6 Hours

Unit - 6

Fuzzy rule-based systems: Natural language, Linguistic hedges, Rule-based system-canonical rule forms, Decomposition of compound rules, Likelihood and truth qualification, Aggregation of fuzzy rules, Graphical techniques of inference.

6 Hours

Unit - 7

Fuzzy decision making: Fuzzy synthetic evaluation, Fuzzy ordering, Preference and consensus, Multiobjective decision making under fuzzy states and fuzzy actions.

8 Hours

Unit - 8

Fuzzy classification: Classification by equivalence relations-crisp relations, Fuzzy relations cluster analysis, Cluster validity, c-Means clustering-hard c-Means (HCM), Fuzzy c-Means (FCM), classification metric, Hardening the fuzzy c-Partition, Similarity relations from clustering.

6 Hours

Text book:

1. **“Fuzzy logic with Engineering applications”**, Timothy J. Ross, McGraw-Hill, 1997.

Reference book:

1. **Nural networks and fuzzy systems: A dynamical system approach**, B. Kosko, Peasrson Edu. 1991.