SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(A Constituent College of Sri Siddhartha Academy of Higher Education)

Master of Technology in Computer Science &Engg.

Scheme and Structure
2022-23

I Semester

Subject Code	Subject	L – T – P – C	Marks for		
			CIE	SEE	Total
CSE101	Advanced operating systems	4 - 0 - 0 - 4	50	50	100
CSE102	Advanced database management systems	4 - 0 - 0 - 4	50	50	100
CSE103	Advanced algorithms	4 - 0 - 0 - 4	50	50	100
CSE104	Internet of things	3 - 0 - 0 - 3	50	50	100
CSE1PE5X	Professional Elective - I	3 - 0 - 0 - 3	50	50	100
CSEIPE6X	Professional Elective - II	3 - 0 - 0 - 3	50	50	100
CSE1TS1	Technical Seminar -I	0 - 0 - 0 - 1.5	50	--	50
CSE1LB1	Advanced operating systems and Algorithms Laboratory	0 - 0 - 3 - 1.5	50	--	50
	Total Credits	**24**	**400**	**300**	**700**

Elective-I	
CSE1PE51	**Artificial Intelligence and Expert Systems**
CSE1PE52	Protocol Engineering
CSE1PE5	Advanced Cryptography

Elective-II	
CSE1PE61	**Advanced Storage area networks**
CSE1PE62	Big Data and Hadoop
CSE1PE63	Wireless sensor networks

II Semester

Subject Code	Subject	L – T – P – C	Marks for		
			CIE	SEE	Total
CSE201	Advanced Computer Networks	4 - 0 - 0 - 4	50	50	100
CSE202	Advanced computer system architecture	4 - 0 - 0 - 4	50	50	100
CSE203	Machine learning	4 - 0 - 0 - 4	50	50	100
CSE204	Advanced Software Engineering	3 - 0 - 0 - 3	50	50	100
CSE2PE5X	Professional elective -I	3 - 0 - 0 - 3	50	50	100
CSE2PE6X	Professional elective -II	3 - 0 - 0 - 3	50	50	100
CSE2TS2	Technical Seminar -II	0 - 0 - 0 - 1.5	50	--	50
CSE2LB2	Machine learning lab	0 - 0 - 3 - 1.5	50	--	50
	Total Credits	**24**	**400**	**300**	**700**

Elective-I	
CSE2PE51	Optical Networks
CSE2PE52	Cloud Computing
CSE2PE53	Block Chain Technology

Elective-II	
CSE2PE61	Business Intelligence and Data Mining
CSE2PE62	Cyber Security
CSE2PE63	Advanced Mobile Computing

III Semester

Subject Code	Subject	Credits	Marks for		
			CIE	SEE	Total
CSE3IS1	Internship	12	100	=	100
CSE3PW1	Project Work Phase - I	8	50	-	50
	Total Credits	**20**	**150**	**-**	**150**

Note:
Internship: Report Evaluation on internship (50 Marks), Viva-Voce and Evaluation of Internship (50 Marks)
Project work Phase – I : Literature Survey / visit to Industry to finalize the project and presentation of the same (50 Marks)

IV Semester

Subject Code	Subject	Credits	Marks for		
			CIE	SEE	Total
CSE2PW2	Project Work Phase - II	20	100	200	300
	Total Credits	**20**	**100**	**-**	**300**

Note:

Project work phase – II:

1. Presentation of the project work carried out for the first six weeks (50 Marks)
2. Project work Seminar – II : presentation of the project work carried out for the next eight weeks (50 Marks)
3. Project work evaluation taken up at the end of the IV semester
4. Report evaluation: Average of the marks evaluated by internal and external examiners (125 Marks)
5. Viva-Voce conducted and evaluated jointly by internal and external examiners (75 Marks)

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CSE1PE5X	Professional Elective - I	3 - 0 - 0 - 3	50	50	100
CSEIPE6X	Professional Elective - II	3 - 0 - 0 - 3	50	50	100
CSE1TS1	Technical Seminar -I	0 - 0 - 0 - 1.5	50	--	50
CSE1LB1	Advanced operating systems and Algorithms Laboratory	0 - 0 - 3 - 1.5	50	--	50
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CSE1PE51	**Artificial Intelligence and Expert Systems**
CSE1PE52	Protocol Engineering
CSE1PE5	Advanced Cryptography

Elective-II	
CSE1PE61	**Advanced Storage area networks**
CSE1PE62	Big Data and Hadoop
CSE1PE63	Wireless sensor networks

Advanced Operating Systems

Subject Code: CSE101 **Credits: 4-0-0-4**

UNIT – I **10Hours**

Introduction, Review Operating Systems Strategies: User' perspectives, technologies and examples of Batch Systems, Timesharing Systems, Personal computer systems, Embedded systems, and small communicating computers; The genesis of modern operating systems.

UNIT – II **12Hours**

Using the Operating Systems The programmer's abstract machine; Resources; Processes and threads; Writing concurrent programs. Operating Systems Organization Basic functions; General implementation considerations; Contemporary OS kernels.

UNIT – III **10Hours**

Design Strategies Design considerations; Monolithic kernels; Modular organization; Microkernel; Layered organizations; Real World Examples Linux, Windows NT/2000/XP: Process descriptors, Thread descriptors, Thread scheduling. Linux, Windows NT/2000/XP: Kernel

UNIT – IV **10Hours**

Distributed Computing System Fundamentals: Introduction to distributed computing systems, Models, Distributed operating system, Design issues of distributed operating system. Distributed Shared Memory: General Architecture of DSM systems. Design and implementation issues of DSM, Granularity, Structure of Shared Memory Space, Consistency models. Replacement Strategy, Thrashing, Other approaches to DSM, Heterogeneous DSM, Advantages of DSM.

UNIT – V **10Hours**

Resource Management : Features of global scheduling algorithm, Task assignment approach, Load-Balancing and Load-sharing approach. Distributed File Systems : Features of Good DFS, File Models, File-Accessing models, File Service Architecture, File-sharing semantics, File Caching schemes, File replications.

Laboratory Work: (The following programs can be executed on any available and suitable platform)

1. Design, develop and execute a program using any thread library to create the number of threads specified by the user; each thread independently generates a random integer as an upper limit, and then computes and prints the number of primes less than or equal to that upper limit along with that upper limit.
2. Rewrite above program such that the processes instead of threads are created and the number of child processes created is fixed as two. The program should make use of kernel timer to measure and print the real time, processor time, user space time and kernel space time for each process. Design, develop and implement a process with a producer thread and a consumer thread which make use of a bounded buffer (size can be prefixed at a suitable value) for communication. Use any suitable synchronization construct.
3. Design, develop, and execute a program to solve a system of n linear equations using Successive Over-relaxation method and n processes which use Shared Memory API.
4. Design, develop, and execute a program to demonstrate the use of RPC.

Text Books:

1. Gary Nutt: Operating Systems, 3rd Edition, Pearson, 2004.
2. Pradeep K Sinha: Distributed Operating Systems , 4th Edition Prentice Hall, 2008.

Reference Books:

1. William Stallings: Operating Systems: Internals and Design Principles, 6th Edition, Prentice Hall, 2020

Advanced Database Management System

Subject Code: CSE102 **Credits: 4-0-0-4**

UNIT-I **12 Hours**

Transaction Processing System

Introduction to Transaction processing, Transaction and System Concepts, Desirable Properties of Transactions, characterizing schedules based on Recoverability and Serializability, transaction support in SQL.

Two phase Locking Techniques for Concurrency control, concurrency control based on Timestamp ordering. Multiversion concurrency control techniques.

Recovery concepts, Recovery Techniques based on deferred update and Immediate Update, shadow paging, ARIES Recovery Algorithm.

UNIT-II **10 Hours**

Distributed Data Bases And Client Server Architecture

Distributed Database concepts, Data fragmentation, Replication and Allocation Techniques for Distributed Database Design, Types of Distributed Database systems, Query processing in distributed Databases, Overview of concurrency control and Recovery in Distributed Databases, An overview of 3-tier client server Architecture

UNIT-III **10 Hours**

Enhanced Data Models For Advanced Applications

Active database concepts and Triggers, Temporal Database concepts, Spatial and multimedia databases, introduction to Deductive databases, mobile databases.

UNIT-IV **10 Hours**

Emerging Technologies

Web database programming using PHP: Structured, semistructured and unstructured Data, A simple PHP example, overview of Basic features of PHP, overview of PHP Database programmingXML:XML hierarchical data model, XML Documents DTD and XML Schema, XML Documents and databases, XML querying.

UNIT-V **10 Hours**

Datamining Concepts

Overview of data mining technology, association rules, classification, clustering, approaches to other data mining problems, applications of data mining, commercial data mining tools

Text books:

1. Fundamentals of Database Systems by RamezElmasri and Shamkant B Navathe 5th Edition Pearson Publications.

Reference books:

1. “Database System” by Raghuramakrishn

Advanced Algorithms

Subject Code: CSE103 **Credits: 4-0-0-4**

UNIT-I **11 Hours**

Review of Analysis Techniques: Growth of Functions: Asymptotic notations; Standard notations and common functions; Recurrences and Solution of Recurrence equations- The substitution method, The recurrence – tree method, The master method; Amortized Analysis: Aggregate, Accounting and Potential Methods.

UNIT-II **11 Hours**

Graph Algorithms: Bellman - Ford Algorithm; Single source shortest paths in a DAG; Johnson's Algorithm for sparse graphs; Flow networks and Ford-Fulkerson method; Maximum bipartite matching.

UNIT-III **10 Hours**

Number -Theoretic Algorithms: Elementary notions; GCD; Modular Arithmetic; Solving modular linear equations; The Chinese remainder theorem; Powers of an element; RSA cryptosystem; Primality testing; Integer factorization.

UNIT-IV **10 Hours**

String-Matching Algorithms: Naïve string Matching; Rabin - Karp algorithm; String matching with finite automata; Knuth-Morris-Pratt algorithm; Boyer – Moore algorithms.

UNIT-V **10 Hours**

Probabilistic and Randomized Algorithms: Probabilistic algorithms; Randomizing deterministic algorithms, Monte Carlo and Las Vegas algorithms; Probabilistic numeric algorithms.

Laboratory Work:

1. Design, develop, and run a program in any language to implement the Bellman-Ford algorithm and determine its performance.
2. Design, develop, and run a program in any language to implement Johnson's algorithm and determine its performance.
3. Design, develop, and run a program in any language to implement a Monte Carlo algorithm to test the primarily of a given integer and determine its performance.
4. Design, develop, and run a program in any language to solve the string matching problem using naïve approach and the KMP algorithm and compare their performances.
5. Design, develop, and run a program in any language to solve modular linear equations.

Text Books:

1. T. H Cormen, C E Leiserson, R L Rivest and C Stein: Introduction to Algorithms, 3rd Edition, Prentice-Hall of India, 2010.

2. Kenneth A. Berman, Jerome L. Paul: Algorithms, Cengage Learning, 2002.

Reference Books:

1. Ellis Horowitz, SartajSahni, S.Rajasekharan: Fundamentals of Computer Algorithms, 2nd Edition, Universities press, 2007.

Internet of Things

Subject Code: CSE104 **Credits: 3-0-0-3**

UNIT-I **8 Hours**

What is IoT, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture, The Core IoT Functional Stack, IoT Data Management and Compute Stack..

UNIT-II **8 Hours**

Smart Objects: The "Things" in IoT, Sensors, Actuators, and Smart Objects, Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies

UNIT-III **8 Hours**

IP as the IoT Network Layer, The Business Case for IP, The need for Optimization, Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods

UNIT-IV **8 Hours**

Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology, Edge Streaming Analytics, Network Analytics, Securing IoT, A Brief History of OT Security, Common Challenges in OT Security, How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment

UNIT-V **8 Hours**

IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software, Fundamentals of Arduino Programming. IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi, About the Raspberry Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi with Python, Wireless Temperature Monitoring System Using Pi, DS18B20 Temperature Sensor, Connecting Raspberry Pi via SSH, Accessing Temperaturefrom DS18B20 sensors, Remote access to RaspberryPi, Smart and Connected Cities.

Textbook:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry,"IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", 1stEdition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)
2. Srinivasa K G, "Internet of Things",CENGAGE Leaning India, 2017

Reference Books:

1. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)", 1stEdition, VPT, 2014. (ISBN: 978-8173719547)
2. Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGrawHill Education, 2017. (ISBN: 978-9352605224)

Artificial Intelligence and Expert Systems

Subject Code: CSE1PE51 **Credits: 3-0-0-3**

UNIT-I **8 Hours**

Introduction and Problems, Problem Spaces and Search:

What is AI? Intelligent agents: agents and environment; rationality; the nature of environment; the structure of agents. Problem-solving; problem-solving agents; example problems; searching for solution; uninformed search strategies. Defining the problem as a state space search; production systems; problem characteristics; production system characteristics; issues in the design of search programs

UNIT-II **8 Hours**

Heuristic search techniques

Generate-and-test; hill climbing; best-first search; problem reduction; constraint satisfaction

UNIT-III **8 Hours**

Knowledge representation and predicate logic

Representations and mappings; approaches to knowledge representation; issues in knowledge representation; the frame problem. Representing simple facts in logic; representing instance and isa relationships; computable functions and predicates; resolution.

UNIT-IV **8 Hours**

Logical Agents:

Knowledge-Based Agents, The Wumpus World, Logic, Propositional Logic, Reasoning Patterns in Propositional Logic , Reasoning Patterns in Propositional Logic Resolution, Effective propositional inference, Agents Based on Propositional Logic, First-Order Logic, Representative Revisited, Syntax and semantics of First-Order Logic, Using First-order Logic, Knowledge Engineering in First-Oder Logic.

UNIT-IV **8 Hours**

Statistical Reasoning and Expert Systems

Probability and Bayes Theorem; Certainty Factors and Rule-Based Systems; Bayesian Networks; Dempster-Shafer Theory; Fuzzy Logic. Representing and Using Domain Knowledge; Expert System Shells; Explanation; Knowledge Acquisition.

Text Books:

1. Elaine Rich, Kevin Knight: “Artificial Intelligence”, 3rd Edition, Tata McGraw Hill, 2009
2. Stuart Russel, Peter Norvig: “Artificial Intelligence A Modern Approach”, 2nd Edition, Pearson Education, 2003

Reference Books:

1.Nils J. Nilsson: “Principles of Artificial Intelligence”, Elsevier, 1980

Protocol Engineering

Subject Code: CSE1PE52 **Credits: 3-0-0-3**

UNIT-I **8 Hours**

Introduction: Communication model, Communication Software, Communication Subsystems, Communication Protocol Definition/Representation, Formal and Informal Protocol Development Methods, Protocol Engineering Phases **Network Reference Model**: Layered Architecture, Network Services and Interfaces, Protocol Functions: Encapsulation, Segmentation, Reassembly, Multiplexing, Addressing, OSI Model Layer Functions, TCP/IP Protocol Suite, Application Protocols.

UNIT-II **8 Hours**

Protocol Specification: Components of specification, Service specification, Communication Service Specification Protocol entity specification: Sender, Receiver and Channel specification, Interface specifications, Interactions, Multimedia specifications, Alternating Bit Protocol Specification, RSVP specification

UNIT-III **8 Hours**

Protocol Specification Langugages: SDL – Salient Features, Description of Communication System by SDL, Examples of SDL Based Protocol Specifications, SPIN – The PROMELA Languages, The SPIN Tool, Estelle – Brief overview of ESTelle Principal Concepts, E-LOTOS – An Exapmle Two Position Register, CPN, Uppaal – The Modeling Language, The Query Language, UML – Use Case Diagram, Sequence Diagram, E-R Diagram.

UNIT-IV **8 Hours**

Protocol Verification / Validation: Protocol Verification using FSM, ABP Verification, Protocol Design Errors, Deadlocks, Unspecified Reception, Non-executable Interactions, State Ambiguities, Protocol Validation Approaches: Perturbation Technique, Reachability Analysis, Fair Reachability Graphs, Process Algebra based Validation, SDL Based Protocol Verification: ABP Verification, Liveness Properties, SDL Based Protocol Validation: ABP Validation.

UNIT-V **8 Hours**

Protocol Conformance and Performance Testing: Conformance Testing Methodology and Framework, Local and Distributed Conformance Test Architectures, Test Sequence Generation Methods: T, U, D and W methods, Distributed Architecture by Local Methods, Synchronizable Test Sequence, Conformance testing with Tree and Tabular Combined Notation (TTCN), Conformance Testing of RIP, Testing Multimedia Systems, quality of service test architecture(QOS), Performance Test methods, SDL Based Performance Testing of TCP, OSPF, Interoperability testing, Scalability testing protocol synthesis problem.

Text Books:

1. PallapaVenkataram and Sunilkumar S. Manvi, B. SathishBabu: Communication Protocol Engineering, Second Edition, PHI, 2014.

Reference Books:

1. Mohammed G. Gouda: Elements of Protocol Design, Wiley Student Edition, 2004.

Advanced Cryptography

Subject code: CSE1PE53 **Credits: 3-0-0-3**

UNIT I **8 Hours**

OSI security architecture: Classical encryption techniques, Cipher principles, Data encryption standard, Block cipher design principles and modes of operation, Evaluation criteria for AES, AES cipher, Triple DES, Placement of encryption function, Traffic confidentiality.

UNIT II **8 Hours**

Key management: Diffie Hellman key exchange, Elliptic curve architecture and cryptography, Introduction to number theory, Confidentiality using symmetric encryption, Public key cryptography and RSA.

UNIT III **8 Hours**

Authentication requirements: Authentication functions, Message authentication codes, Hash functions, Security of hash functions and MACS, MD5 Message Digest algorithm, Secure hash algorithm, Ripend, HMAC digital signatures, Authentication protocols.

UNIT IV **8 Hours**

Quantum Cryptography and Quantum Teleportation: Heisenberg uncertainty principle, polarization states of photons, quantum cryptography using polarized photons, local vs. non local interactions, entanglements, EPR paradox, Bell's theorem, Bell basis, teleportation of a single qubit theory and experiments.

UNIT V **8Hours**

Future trends: Review of recent experimental achievements, studyon technological feasibility of a quantum computer candidate physical systems and limitations imposed by noise.

Text Books:

1. William Stallings, "Cryptography and Network Security -Principles and Practices", 3rd Edition, Prentice Hall of India, 2003.
2. AtulKahate, "Cryptography and Network Security", Tata McGraw -Hill, 2003.
3. William Stallings, "Network Security Essentials: Applications and Standards", Pearson Education Asia, 2000.

References:

1. R. P. Feynman, "Feynman lectures on computation", Penguin Books, 1996.
2. Gennady P. Berman, Gary D. Doolen, Ronnie Mainiri&ValdmisItriFrinovich, "Introduction to quantum computers", World Scientific, Singapore, 1998.
3. Jonathan Katz, Yehuda Lindell,"Introduction to Modern Cryptography" Principles And Protocols",CRCPres

Advanced Storage Area Networks

Subject Code: CSE1PE61 **Credits: 3-0-0-3**

UNIT I **8 Hours**

Introduction
Information storage, Data center Infrastructure, Key challenges, Information lifecycle. Server centric IT architecture and its limitations, Storage centric IT architecture and its advantages, Case study: Replacing a server with storage networks.

UNIT II **8 Hours**

Intelligent Disk Subsystems
Architecture of intelligent disk subsystems, Hard disks and internal I/O channels, JBOD, Storage virtualization using RAID and different RAID levels. Caching: Acceleration of hard disk access, Intelligent disk subsystems, Availability of disk subsystems.

UNIT III **8 Hour**

I/O Techniques
The physical i/o path from the cpu to the storage system, SCSI: basics, storage networks, Fibre channel protocol stack: Links, ports and Topologies, FC0, FC1, FC2, FC3, Link and Fabric services, FC4 and ULPs, Fibre channel SAN: Point-to-point, Fabric and Arbitrated loop topology. Hardware components for Fibre channel SAN, InterSANs, Interoperability of FC SAN.

UNIT IV **8 Hours**

IP Storage, File system and NAS
IP Storage Standards: iSCSI, iFCP, mFCP, FCIP, and iSNS, TCP/IP and Ethernet as an I/O technology, Migration from SCSI and FC to IP storage. Local file systems: File systems and Databases, Journaling, Snapshots, Volume manager, Network file systems and file servers, Shared disk file systems, Comparison: NAS, FC SAN and iSCSI SAN.

UNIT V **8 Hours**

Storage Virtualization and Application of Storage Networks
Definition of Storage virtualization, Implementation considerations, Storage virtualization on block or file level, Storage virtualization on various levels of the storage network, Symmetric and asymmetric storage virtualization in the network. Definition of the term 'Storage Network', Storage sharing: Disk storage pooling, Dynamic tape library sharing, Data sharing. Availability of Data.

Text books:

1. Ulf troppens, Rainer erkins and Wolfgang Muller: “Storage networks explained”, Wiley India, 2007.

2. G. Somasundaram, AlokShrivastava (Editors): Information Storage and Management, EMC Education Services, Wiley- India, 2009

Big Data and Hadoop

Subject Code: CSE1PE62 **Credits: 3-0-0-3**

UNIT I **8 Hours**

Introduction to Big Data: what is big data? Why is big data? Unstructured data – industry examples of big data – web analytics – big data and marketing – fraud and big data – risk and big data – credit risk management – big data and algorithmic trading – big data and healthcare – big data in medicine – advertising and big data – big data technologies –Crowd sourcing analytics – inter and Trans firewall analytics

UNIT II **8 Hours**

Introduction to Hadoop: – open source technologies, Introduction to Map Reduce, HDFS, The Hadoop Ecosystem (Batch Processing), HadoopUnits, HDFS Framework, Hadoop Physical & Logical Resource Requirements, Hadoop& Linux Performance Considerations,

UNIT III **8 Hours**

Introduction to Data Mining: Data quality, classification basic concepts and algorithms, association analysis basic concepts and analysis.

UNIT IV **8 Hours**

Introduction to Predictive analytics, Data Visualization Techniques: Visualization Tools and Techniques.

UNIT V **8 Hours**

Case Studies and Illustrations:

IBM BigInsights, BigSheets, and Netezza Customer Intelligence, RainStor Big Data Analytics on Hadoop - The Industry's First Enterprise-Class Database Running Natively on Hadoop, DataStax (Including Coverage of the Free "Community Edition" of DataStax's Cassandra Implementation, with OpsCenter), Microsoft's Big Data Solution

Recommended Learning Resources:

1. O'Reilly, HadoopOperations,by Eric Sammer, O'Reilly Media, 2012.
2. P. Tan, M. Steinbach, V. Kumar, Introduction to Data Mining, Addison-Wesley, 2005.
3. J. Han, M. Kamber, Data Mining: Concepts and Techniques, 2nd ed. Morgan Kaufmann, 2005.
4. Michael Minelli, Michele Chambers, AmbigaDhiraj: Big Data ,Big Analytics, Wiley

Wireless Sensor Networks

Subject Code: CSE1PE63 **Credits: 3-0-0-3**

UNIT I **8 Hours**

Introduction and overview of wireless sensor networks – introduction, basic overview of the technology.
Applications of wireless sensor networks - Introduction, Background, Range of Applications, Examples of Category 2 WSN Applications, Examples of Category 1 WSN Applications, Another Taxonomy of WSN Technology.

UNIT II **8 Hours**

Basic wireless sensor technology – introduction, sensor node technology, sensor taxonomy, wn operating environment, wn trends.
Wireless transmission technology and systems - Introduction, Radio Technology Primer, Available Wireless Technologies.

UNIT III **8 Hours**

Medium Access Control Protocols For Wireless Sensor Networks – Introduction, Background, Fundamentals of MAC Protocol, MAC Protocols for WSN, Sensor Mac Case Study, IEEE 802.15.4 LR-WPAN'S Standard Case Study.
Transport Control Protocols For Wireless Sensor Networks – Traditional Transport Control Protocols, Transport Protocol Design Issues, Examples of Existing Transport Control Protocols, Performance of Transport Control Protocols.

UNIT IV **8 Hours**

Routing Protocols For Wireless Sensor Networks – Introduction, Background, Data Dissemination and Gathering, Routing Challenges and Design Issues in Wireless Sensor Networks, Routing Strategies in Wireless Sensor Networks.

UNIT V **8Hours**

Operating systems for wireless sensor networks – introduction, operating system design issues, examples of operating systems.

Performance and traffic management – Introduction, Background, WSN Design Issues, Performance Modelling of WSN'S, Case Study Simple Computation of the System Life Span.

Text Books:

1. KazemSohraby, Daniel Minoli, TaiebZnati: Wireless Sensor Networks – Technology, Protocols and Applications, A John Wiley Publications, 2007.

Reference Books:

1. Holger Karl, Andreas Willig, "Protocols and Architectures for Wireless Sensor Networks", John Wiley & Sons, Inc., 2005.
2. Feng Zhao, Leonidas Guibas: Wireless Sensor Networks – An Information Processing Approach, Elsevier, 2004

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CSE203	Machine learning	4 - 0 - 0 - 4	50	50	100
CSE204	Advanced Software Engineering	3 - 0 - 0 - 3	50	50	100
CSE2PE5X	Professional elective -I	3 - 0 - 0 - 3	50	50	100
CSE2PE6X	Professional elective -II	3 - 0 - 0 - 3	50	50	100
CSE2TS2	Technical Seminar -II	0 - 0 - 0 - 1.5	50	--	50
CSE2LB2	Machine learning lab	0 - 0 - 3 - 1.5	50	--	50
	Total Credits	**24**	**400**	**300**	**700**

Elective-I	
CSE2PE51	Optical Networks
CSE2PE52	Cloud Computing
CSE2PE53	Block chain Technology And Its Applications

Elective-II	
CSE2PE61	Business Intelligence and Data Mining
CSE2PE62	Cyber Security
CSE2PE63	Advanced Mobile Computing

Advanced Computer Networks

Subject Code: CSE201 **Credits: 4-0-0-4**

UNIT -1 **10 Hours**

Foundation: Building a Network, Requirements, Perspectives, Scalable Connectivity. Cost-Effective Resource sharing ,Support for Common Services, Support for Common Services, Manageability,Networkarchitecture:Layering and protocols,Internet architecture. Performance, Bandwidth and Latency, Delay X Bandwidth Product, Perspectives on Connecting,Error detection ,Two dimensional parity,Internet checksum algorithm,Cyclic redundancy check,Classes of Links, Reliable Transmission, Stop-and-Wait , Sliding Window.

UNIT II **10 Hours**

Internetorking- I

Switching and Bridging, Datagram's, Virtual Circuit Switching, Source Routing, Bridges and LAN Switches, Basic Internetworking (IP), What is an Internetwork ?, Service Model, Global Addresses, Datagram Forwarding in IP, subnetting and classless addressing, Address Translation(ARP), Host Configuration(DHCP), Error Reporting(ICMP), Virtual Networks and Tunnels.

UNIT III **10 Hours**

Internetworking- II

Network as a Graph, Distance Vector(RIP), Link State(OSPF), Metrics, The Global Internet, Routing Areas, Routing among Autonomous systems(BGP), IP Version 6(IPv6), Multiprotocol label switching(MPLS),Destination based forwarding, Explicit routing, Virtual private networks and tunnels.

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UNIT IV **10 Hours**

End-to-End Protocols, Simple Demultiplexer (UDP), Reliable Byte Stream(TCP), End-to-End Issues, Segment Format, Connecting Establishment and Termination, Sliding Window Revisited, Triggering Transmission, Adaptive Retransmission, Record Boundaries, TCP Extensions, Queuing Disciplines, FIFO, Fair Queuing, TCP Congestion Control, Additive Increase/ Multiplicative Decrease, Slow Start, Fast Retransmit and Fast Recovery.

UNIT V **10 Hours**

Applications

Traditional applications, Electronic Mail (SMTP, MIME, IMAP), World Wide Web (HTTP), Web Services, multimedia applications,infrastructure services, Name Service (DNS), Network Management (SNMP), overlay networks, Routing Overlays, Peer-to-Peer Networks, Content Distribution Networks

Text Book:

Larry Peterson and Bruce S Davis "Computer Networks : A System Approach" 5th Edition ,Elsevier -201

References:

1. **Uyless Black** "Computer Networks, Protocols , Standards and Interfaces" 2nd Edition - PHI3. Nils J. Nilsson: "Principles of Artificial Intelligence", Elsevier, ISBN-13: 9780934613101
2. **Douglas E Comer, "**Internetworking with TCP/IP, Principles, Protocols and Architecture" 6th Edition,PHI – 2014

Advanced Computer System Architecture

Subject Code: CSE202 **Credits: 4-0-0-4**

UNIT I **10 Hours**
Parallel Computer Models.

The State of Computing, Computer Development Milestones, Elements of Modern Computers, Evolution of Computer Architecture, System Attributes to Performance , Multiprocessors and Multicomputer Shared –Memory Multiprocessors, Distributed Memory Multiprocessors, A Taxonomy of MIMD Computers, Multi vector and SIMD computers, Vector Supercomputers, SIMD Supercomputers.

UNIT II
Instruction –Level Parallelism **10 Hours**

Concepts and challenges; Basic Compiler Techniques for exposing ILP; Reducing Branch costs with prediction; Overcoming Data hazards with Dynamic scheduling; Dynamic scheduling: Examples and Algorithms;

UNIT III **10 Hours**

Advanced Processors:
Advanced Processor technology, Instruction-set Architectures, CISC Scalar Processors, RISC Scalar Processors, Super Scalar Processors, VLIW Architectures, Vector and Symbolic Processors

UNIT IV **10 Hours**
Memory Hierarchy Design
Introduction; Advavaced optimizations of Cache performance; memory technology and optimizations, Protection via virtual memory,Protection via virtual machines

UNIT V **12 Hours**
Workload Driven Evaluation and Scalable multi processors

Basics measures of multiprocessors performance, scaling, key issues in scaling, scaling methods and speed up measures, evaluating real machine, evaluating a fixed sized machine. Scalability, bandwidth scaling, latency scaling, cost scaling, physical scaling,

TEXT BOOKS:

1. Hennessey and Patterson: “Computer Architecture A Quantitative Approach”, 4th Edition, Elsevier, 2007.
2. Kai Hwang: “Advanced Computer Architecture Parallelism, Scalability, Programmability”, Tata McGraw-Hill, 2010.
3. David culler, J.P.singh, Anoopgupta ,; “Parallel computer architecture “ Margon Kauffman 2004

Reference Books:

1. John P Hayes; computer architercture& organization 1998
2. V rajaramanna , c s r murthy,; parallel computers ,phi 2000

Machine Learning

Sub code: CSE203 **Credits – 4-0-0-4**

UNIT-1 **10 HoursIntroduction to Machine Learning**

What is machine learning?, Key terminology, Key tasks of machine learning, How to choose the right algorithm, Steps in developing a machine learning application, What kind of problems can be tackled using machine learning, A Simple Machine-Learning Task: Training Sets and Classifiers, Minor Digression: Hill-Climbing Search, Hill Climbing in Machine Learning, Some Difficulties with Available Data

UNIT-11

Bayesian Classifiers 12 Hours

The Single-Attribute Case, Vectors of Discrete Attributes, Probabilities of Rare Events: Exploiting the Expert's Intuition, How to Handle Continuous Attributes, Gaussian "Bell" Function: A Standard pdf, Approximating PDFs with Sets of Gaussians.

Nearest-Neighbor Classifiers

The k-Nearest-Neighbor Rule, Measuring Similarity, Irrelevant Attributes and Scaling Problems, Performance Considerations, Weighted Nearest Neighbors, Removing Dangerous Examples, Removing Redundant Examples

UNIT-III **10 Hours**

Linear and Polynomial Classifiers

The Essence, The Additive Rule: Perceptron Learning, The Multiplicative Rule: WINNOW, Domains with More Than Two Classes, Polynomial Classifiers, Specific Aspects of Polynomial Classifiers.

Artificial Neural Networks

Multilayer Perceptron's as Classifiers, Neural Network's Error, Back propagation of Error, Special Aspects of Multilayer Perceptron's, Architectural Issues.

UNIT-IV **10 Hours**

Decision Trees

Decision Trees as Classifiers, Induction of Decision Trees, How Much Information Does an Attribute Convey?, Binary Split of a Numeric Attribute, Pruning, Converting the Decision Tree into Rules.

Unsupervised Learning

Cluster Analysis, A Simple Algorithm: k-Means, More Advanced Versions of k-Means, Hierarchical Aggregation

UNIT-V 10 Hours

Classifiers in the Form of Rulesets

A Class Described By Rules, Inducing Rulesets by Sequential Covering, Predicates and Recursion, More Advanced Search Operators.

The Genetic Algorithm

The Baseline Genetic Algorithm, Implementing the Individual Modules, Why It Works, The Danger of Premature Degeneration, Other Genetic Operators, Some Advanced Versions, Selections in k-NN Classifiers.

Text books

1. Machine Learning in Action Peter Harrington 1st Edition, Manning Publications, April 2012,

2. An Introduction to Machine Learning MiroslavKubat2nd Edition, Springer,

Reference Books

1. Machine Learning- Tom M. Mitchell India Edition 2013, McGraw Hill

2. Machine Learning – An Algorithmic Perspective Stephen Marsland, 2nd Edition 2014

Advanced Software Engineering

Course Code: CSE204Credit: 3-0-0-3.

UNIT I: 8 HoursSoftware And Software Engineering:

The Nature of Software, the Unique Nature of Web Apps, Software Engineering, The Software Process,

The Software Process: Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models: The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models, Specialized Process Models,

Introduction To Agility: What Is Agility?, Agility and the Cost of Change, What Is an Agile Process.

UNIT II: 8 HoursRequirements Engineering And Modeling:

Requirements Engineering, Requirements Analysis, Scenario-Based Modeling, UML Models That Supplement the Use Case, Data Modeling Concepts, Class-Based Modeling. Requirements Modeling Strategies, Flow-Oriented Modeling, Creating a Behavioral Model, Requirements Modeling for WebApps – How Much Analysis is Enough, Requirements Modeling Input, Requirements Modeling Output, Functional Model for WebApps.

UNIT III: 8 Hours

Design Concepts: Design within the Context of Software Engineering, The Design Process, Design Concepts, The Design Model.

Architectural Design: Software Architecture, Architectural Genres, Architectural Styles, Architectural Design, Assessing Alternative Architectural Designs

UNIT IV: 8 Hours

Software Testing Strategies: A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Test Strategies for Object-Oriented Software, Test Strategies for WebApps, Validation Testing, System Testing, The Art of Debugging.

UNIT V: 8 Hours

Project Management Concepts: The management spectrum, People, Product, Process, Project, W5HH principle.

Estimation For Software Projects: Observations on estimation, project planning process, software scope and reliability, Resources, Project estimation, decomposition techniques, empirical estimation models.

Text Book:

1. Software Engineering - A Practitioners approach, Roger .G. Pressman, 7th Edition Tata McGrawhill.

Reference Books:

1. An Integrated Approach to Software Engineering. PankajJolate, Narosa Publications,
2. Software Engineering, 8th Edition, Ian Sommerville, Pearson Education Ltd.

OPTICAL NETWORKS

Code: CSE2PE51 **credits: 3-0-0-3**

UNIT-1 **10 Hours**

Timing and Synchronization: Timing and Synchronization in Digital Networks; Effects; The Clocking Signal; Types of Timing & Variations; Methods; Distribution of Timing Using SONET and DS1; Timing Downstream Devices; Building Integrated Timing Supply; Synchronization Status Messages and Timing Loops.

Introduction: Three generations of Digital Transport Networks; introduction to WDM and TDM; The Optical Marketplace; Wireless Optical Systems; Key Optical Nodes;Key Terms; Evolution; Key attributes of Optical Fiber. **Telecommunications Infrastructure**: The Local and backbone Connections; The Digital Multiplexing Hierarchy; Signaling Hierarchies,The Layered Protocol Model in the Transport Network; considerations for Interworking Layer1, Layer 2, and Layer 3 Networks.

Characteristics of Optical Fiber: The Basics; The Wavelength; The Basic Components; Structure; Fiber Types; Key Performance Properties, Attenuation; Amplifier Spontaneous Emission; Chromatic Dispersion; Lasers.

UNIT-II **11 Hours**

SONET and SDH: Introduction; The SONET Multiplexing Hierarchy; SONET and SDH Multiplexing Structure, frame structure, functional components, problem detection; Locating and Adjusting Payload with Pointers; Virtual Tributaries in detail; VT in Virtual Containers; Architecture of Optical Transport Networks: The Digital Wrapper; Control Planes; In-Band and Out-Band Control Signaling; Importance; Current DTH; SONET and SDH Multiplexing Hierarchy; Key Indexes and Other Terms; The New Optical Transport and Digital Transport Hierarchy; The OTN Layered Model; Encapsulation and Decapsulation Operations; Generic Framing Procedure

UNIT-III **11 Hours**

WDM: The WDM Operation; DWDM, TDM and WDM Topologies; Relationship of WDM to SONET / SDH; EDF; WDM Amplifiers; multiplexers; Cross-Connects; Wavelength Continuity Property; Examples & Higher Dispersion for DWDM; Tunable DWDM Lasers.

Network Topologies and Protection Schemes: The Non-Negotiable Requirement; Diversity in the Network; Line and Path Protection Switching; Types; Working and Protection Fibers; Point-to-Point Topology; BLSR; Protection in BLSR; Meshed Topologies; PONs; Metro Optical Networking.

MPLS and Optical Networks: Label Switching; FEC; Types of MPLS Nodes; Label Distribution and Binding; Label Switching and Traffic Forwarding; MPLS Support of VPNs; Traffic Engineering; MPLS; MPLS and Optical TE Similarities; Possibilities for the MPIS Network; Control and Data Planes Interworking

UNIT-IV **10 Hours**

Architecture of IP and MPLS-Based OTNs: IP, MPLS, and Optical Control Planes; Interworking, Management of the Planes; A Framework for the IP over Optical Networks; An Opposing View; Generalized MPLS use in Optical Networks; Bi-Directional LSPs in Optical Networks;
The Link Management Protocol: Keep the Optical Link up and running; What is managed? Databearing Links; Clarification of terms; Basic functions of LMP; CCM; Correlation; Fault Management; Extending LMP operations for Optical Link Systems.
Optical Routers: Optical Switching; Implementation Preferences; Key Terms; Evolution; Optical Router; Switching Technologies; Resources; Protecting the LSP; OSP; Wavelength OSP and MPLS LSP; Nesting the LSPs and OSPs; Plane Coupling and De-Coupling; Approach to LSP and OSP Interworking; MEMS and Optical Switching; Thermo-Optic Switches..

UNIT-V10 Hours

ASON Operation at the UNI and NNI: Objectives of ASON; UNI and NNI; Managing the Optical Bandwidth in the ASON; approach ,Management; IETF Optical Carrier Framework for the UNI; Types of Connections; Signaling Services.
ATM versus IP in Optical Internets: IP over ATM over SONET; The OSI and Internet Layered Models; ATM in the SONET / SDH Payload Envelope; PPP in the SONET Payload Envelope; Encapsulation / Framing Rules; The PPP Packet; The ATM versus IP; Overhead of IP and ATM; Three encapsulation methods Evolving to 3G Architecture: Migration of IP Optical Networking; IP and the Optical Backbones; Placing MPLS into the Picture; Putting it together.

Text Books:

1. Uyless Black: Optical Networks, Pearson Education Asia, 2002.

Reference Books:

1. Rajiv Ramaswami and Kumar N.Sivaranjan: Optical Networks - A Practical Perspective, Morgan Kaufuann, 2000
2. Paul E.Green Jr.: Fiber Optic Network, Prentice Hall, 1993.
3. Jeff Hecht: Understanding Fiber Optics, 4th Edition

Cloud Computing

Subject Code: CS2PE52 **Credits: 3-0-0-3**

UNIT I **08 Hours**

Introduction,
Grid computing, Essentials, Benefits, Why Cloud?, Business and IT Perspective, Cloud and Virtualization, Cloud Services Requirements, Cloud and Dynamic Infrastructure, Cloud Computing Characteristics, Cloud Adoption, Cloud rudiments, (Book 1) Clustering, Difference between Grid and Cluster computing, Characteristics of Cluster and Grid Computing, On demand computing (chapter 1, Book3).

UNIT II **08 Hours**

Cloud Deployment and Service Models:Deployment Models: Introduction, Cloud Characteristics, Measured Service, Cloud Models, Security in a Public Cloud, Public versus Private Clouds, Cloud Infrastructure Self Service. **Service Models:**Introduction, Gamut of Cloud Solutions, Principal Technologies, Cloud Strategy, Cloud Design and Implementation using SOA, Conceptual Cloud Model, Cloud Service Defined.

UNIT III **08 Hours**
Virtualization:
Introduction, Characteristics of Virtualized environments, Taxonomy of Virtualization techniques, Virtualization and Cloud computing, Pros and Cons of Virtualization, Technology Examples: Vmware: Full Virtualization(Chapter 3 from book 2), Virtualization for x86 Architecture, Hypervisor Management Software, Virtual Infrastructure Requirements (from chapter Cloud virtualization of book1).

UNIT IV **08 Hours**

Cloud Service Providers:
Heavy duty and Batch processing, Amazon cloud services, Google cloud platform, IBM smartcloud services, Microsoft Windows Azure, What is Hadoop?, Four phases of a Cloud application, other providers.(Chapter 9 from Book 4).

UNIT V **08 Hours**

Map Reduce and Extensions Parallel computing, The Map Reduce model, Applications of Map Reduce, Parallel efficiency of Map Reduce, Relational Operations using Map Reduce, Enterprise Batch processing using Map Reduce.(Chapter 9 from Book 3)
Text Books:

1. Dr. Kumar Saurabh: "Cloud Computing: Insights in to New-Era Infrastructure" Wiley India publications, 2012.
2. RajkumarBuyya, Christian Vecchiola, S.ThamaraiSelvi: "Mastering Cloud Computing".
3. Dr.U.S.Pandey, Dr.KavitaChoudhary: "Cloud computing", S.Chand Publications
4. Aravind Doss, Rajeev Nanda: "Cloud computing: A practitioner's guide", McGraw hill Education PvtLtd..

Reference Books:

1. Anthony T. Velte, Toby J. Velte, Ph.D., Robert Elsenpeter “Cloud computing – A practical approach”, McGraw Hill.
2. Michael Miller, “ Cloud Computing”, Pearson Education, New Delhi, 2009.

Blockchain Technology And Its Applications

Subject Code: CS2PE53 **Credits: 3-0-0-3**

UNIT 1: **8 hours**

Introduction to Block chain Technology: Introduction, Background and History, Block chain Categorization, Block chain Components, Transactions, Asymmetric-Key Cryptography, Ledgers, Blocks, Chaining Blocks

UNIT 2: **8 hours**

Consensus Models and Forking: Proof of Work Consensus Model, Proof of Stake Consensus Model, Round Robin Consensus Model, Proof of Authority, Proof of Identity Consensus Model, Proof of Elapsed Time Consensus Model, Ledger Conflicts and Resolutions, Forking-Soft Forks, Hard Forks, Cryptographic Changes and Forks

UNIT 3: 8 hours

Smart Contracts: Definition, Ricardian contracts ,Block chain Limitations and Misconceptions, Application Considerations

UNIT 4: **8 hours**

Bitcoin and Ethereum 101: Bit coin, Transactions, block chain, Bit coin payments, Ethereum 101: Introduction, Ethereum block chain, Elements of the Ethereum blockchain, Precompiled contracts.

UNIT 5: **8 hours**

Block chain -Outside of Currencies: Internet of Things, Government, Health, Finance, Media, Scalability and other challenges

Text Books:

1. Mastering Blockchain - Distributed ledgers, decentralization and smart contracts explained, Author- Imran Bashir, Packt Publishing Ltd, Second Edition, ISBN 978-1-78712-544-5, 2017
2. Dylan Yaga, Peter Mell, Nik Roby Karen Scarfone , Blockchain Technology Overview- NISTIR 8202

References.

1. Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction -Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, , Princeton University Press (July 19, 2016).
2. Andreas M Antonopoulos, Mastering Bitcoin, O'Reilly Media publications, First Edition, ISBN: 978-1-449-37404-4, Dec. 2014. (only theory part must be taught, coding not included).
3. D. Drescher, Blockchain Basics. Apress, 2017

Business Intelligence and Data Mining

Subject Code: CSE2PE61 **Credits: 3-0-0-3**

UNIT I **08 Hours**

Introduction to Business Intelligence Introduction to Data Information and knowledge, Data Decision Challenge, Operational vs Information Data, Introduction to Decision Support System, Introduction to Business Intelligence, Business Intelligent System Components, Business Models, Introduction to Data Warehouse, A Business analysis framework for DW.

UNIT II **08Hours**

Data Warehouse Introduction, Data warehouse modeling, Data warehouse design, Data warehouse technology, Distributed Data warehouse, index techniques, materialized view.

UNIT III. **08Hours**

Data Preprocessing and Cube Technology Introduction to Data Preprocessing, Data Cleaning, Data integration, data reduction, transformation and Data Discretization. Introduction to OLAP, Data Cube : A multidimensional model, data cube computation, data cube computation methods : multidimensional data analysis.

UNIT IV. **08Hours**

Mining Frequent Patterns and Association Rule Introduction to association rule, market basket analysis, frequent item set, apriori algorithm, parameter, a pattern growth approach, mining closed and max patterns, pattern evaluation, pattern mining in multilevel, multidimensional data space, pattern exploration and application.

UNIT V. **08Hours**

Classification Basic concepts, decision tree, rule based classification, Bayesian belief networks, classification by back propagation, support vector machines, lazy learners – k-NN classifier, case based reasoning , model evaluation and selection , techniques to improve classification accuracy, multiclass classification, semi-supervised classification, ensemble methods. Clustering Analysis Cluster analysis, Partitioning methods, hierarchical methods, density based methods, grid based methods, clustering graph and network data, clustering with constrains, evaluation of clustering outliers and analysis, outlier detection methods, scalable clustering algorithms.

Text Books :

1. Data mining concepts and techniques, Jawai Han, MichellineKamber, Jiran Pie, Morgan Kaufmann Publishers, 3rd Edition.
2. Introduction to Data Mining, Vipin Kumar, Pang-Ning Tan , Pearson
3. Building the Data Warehouse, William H Inmon, Wiley Publication 4th Edition.
4. Introduction to Business Intelligence & Data Warehousing, IBM, PHI.
5. Business modeling and Data Mining Dorian Pyle, Elsevier Publication MK. 6. Database Systems, Thomas Connolly, Carolyn Begg, Pearson 4th Edition.

Cyber security

Subject Code: CSE2PE62 **Credits: 3-0-0-3**

Unit-1 **08Hours**

Introduction to Cyber Security, Cyber Security Evolution, Cyber Security Objectives, CIA Triads, Reasons for Cyber Crime, Why we need Cyber Security, Damage to the Organisation, History of Cyber Crime

Unit-2 **08 Hours**

Types Of Cyber Crimes, Phishing Scams, Cyber Bullying, Identity Theft, Cyber Bullying, Cyber Stalking, Hacking, DDos Attack, Software Piracy, Malware, History of Malware, Types of Malware, Zero Day Attacks, Types of Network Attacks

Unit-3 **08 Hours**

Planning for Cyber Security, Security Governance, Information Risk Management, Security Management, Managing the Cyber Security Function, People Management, Information Management

Unit 4 **08Hours**

Physical Asset Management, System Development, Business Application Development, System Access, System Management, Technical Security Management, Threat and Incident Management, Business Continuity

Unit 5: **08Hours**

Authrorization and Access Control, Auditing and Accountability, Cyber Laws and Regulations, Compliance, Origins of Operations Security, The Operations Security Process, Human Elements Security, Security Awareness, Protecting Networks, Protecting Network Traffic

TEXT BOOKS:

1. Anand Shinde, Introduction to the Cyber Security – Guide to the world of Cyber Security, , (February 5th, 2021), ISBN-10: 9781637816424, 1637816421

2. William Stallings, Effective Cyber Security – A Guide to Using Best Practices and Standards, (20th July 2018), ISBN-10: 9780134772950, 0134772954

3. Jason Andress, The Basics of Information Security: Understanding the Fundamentals of InfoSec in Theory and Practice, Syngress; 1 edition (June 24, 2011) , ISBN-10: 1597496537

REFERENCES:

1. Stallings, “Cryptography & Network Security - Principles & Practice”, Prentice Hall, 3rd Edition 2002.

2. Bruce, Schneier, “Applied Cryptography”, 2nd Edition, Toha Wiley & Sons, 2007.

3. Man Young Rhee, “Internet Security”, Wiley**,** 2003

Advanced Mobile Computing

Subject Code: CSE2PE63 **Credits: 3-0-0-3**

UNIT I **08Hours**

Mobile Communications-Overview

Mobile computing; Mobile computing architecture; Mobile devices; Mobile system networks; Data dissemination; Mobility management; Mobile phones, Digital Music Players, Handheld Pocket Computers, Handheld Devices, Operating Systems, Smart Systems, Limitations of Mobile Devices, Automotive Systems.

UNIT II **08 Hours**

GSM and Similar Architectures

GSM – Services and System Architectures, Radio Interfaces, Protocols, Localization, Calling, Handover, General Packet Radio Service, High-speed circuit-switched data, DECT.

UNIT III **08 Hours**

Mobile IP Network Layer and Mobile Transport Layer

IP and Mobile IP Network Layers Packet Delivery and Handover Management, Registration, Tunneling and Encapsulation, Route Optimization, Dynamic Host Configuration Protocol. Indirect TCP, Snooping TCP, Mobile TCP, Other Methods of TCP – layer Transmission for Mobile Networks.

UNIT IV **08 Hours**

Databases.

Database Hoarding Techniques, Data Caching, Client – Server Computing and Adaptation, Transactional Models, Query Processing, Data Recovery Process, Issues relating to Quality of Service.

UNIT V **08Hours**

Data Dissemination and Broadcasting Systems.

Communication Asymmetry, Classification of Data – Delivery Mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Techniques, Digital Audio Broadcasting, Digital video Broadcasting**.**

Text Book:

1.Raj Kamal, “Mobile Computing”, Oxford University Press, 2007.

Reference Books:

1. 1.Asoke Talkukder, Roopa R Yavagal, “Mobile Computing – Technology, Applications and Service Creation”, Tata McGraw Hill, 2007
2. 2.RezaB’Far, “Mobile Computing Principles – Designing and Developing Mobile Applications with UML and XML”, Cambridge University press, 5th Edition, 2006.
3. 3.Uwe Hansmann, LothatMerk, Martin S Nicklous and Thomas Stober, Principles of Mobile Computing”, Springer International Edition, Second Edition, 2005
4. 4.Schiller, “Mobile Communication”, Pearson Publication, 2004.