PRIST

DEEMED TO BE

UNIVERSITY

NAAC ACCREDITED

THANJAVUR – 613 403 - TAMIL NADU

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

PROGRAM HANDBOOK

M.Tech

COMPUTER SCIENCE AND ENGINEERING

[FULL TIME]

[REGULATION 2022]

[For candidates admitted to M. Tech CSE program from June 2022 onwards]

DEAN
ENGINEERING AND TECHNOLOGY

HOD
DEPT.OF CSE

HOD

DEAN

DEAN ACADEMIC AFFAIRS

COURSE STRUCTURE

SEMESTER – I

Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
I	22248S11A	Higher Mathematics	4	1	0	4
I	22250H12	Modern Operating System	4	0	0	4
I	22250H13	MachineLearningTechniques	4	0	0	4
I	22250H14	Adhoc and Sensor Network	4	0	0	4
I	22250H15	Advanced Data Structures and Algorithms	4	1	0	4
I	22250E16_	Elective - I	3	0	0	3
Practical						
I	22250L17	Advanced Web Technologies Lab	-	-	3	3
Total no of Credit					**26**	

SEMESTER – II

Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250H21	Middleware Technologies	3	1	0	4
II	22250H22	Object Oriented Software Engineering	4	0	0	4
II	22250H23	Internet of Things	4	0	0	4
II	22250E24_	Elective II	3	0	0	3
II	22250E25_	Elective – III	3	0	0	3
Practical						
II	22250L26	.NET Technologies Lab	-	-	3	3
II	222TECWR	Technical Writing /Seminars	-	-	3	3
Total no of Credit					**24**	

SEMESTER – III

Semester.no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250H31	Software Project Management	4	0	0	4
III	22250E32_	Elective-IV	3	0	0	3
III	22250E33_	Elective-V	3	0	0	3
III	22250E34_	Elective-VI	3	0	0	3
III	22250P35	Project Work- Phase I*	-	-	10	10
Total no of Credit						**23**

SEMESTER – IV

Semester no.	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
IV	22250P41	Project Work- Phase II*	-	-	15	15
Total no of Credit						**15**

*** - Only review will be conducted**

List of Electives
Semester – I - Elective – I

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
I	22250E16A	Multimedia Systems	3	0	0	3
I	22250E16B	Web Engineering	3	0	0	3
I	22250E16C	Software Metrics	3	0	0	3

SEMESTER – II - Elective – II

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250E24A	Advanced Distributed Computing	3	0	0	3
II	22250E24B	Data Warehousing & Data Mining	3	0	0	3
II	22250E24C	Information Retrieval Techniques	3	0	0	3

SEMESTER – II - Elective – III

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250E25A	Service Oriented Architecture	3	0	0	3
II	22250E25B	High Speed Networks	3	0	0	3
II	22250E25C	Language Technologies	3	0	0	3

SEMESTER – III - Elective – IV

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E32A	Cloud Computing	3	0	0	3
III	22250E32B	Speech Processing and Synthesis	3	0	0	3
III	22250E32C	Soft Computing	3	0	0	3

SEMESTER – III - Elective – V

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E33A	Advanced Database Technology	3	0	0	3
III	22250E33B	Reconfigurable Computing	3	0	0	3
III	22250E33C	Green Computing	3	0	0	3

SEMESTER – III - Elective – VI

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E34A	Software Quality Assurance	3	0	0	3
III	22250E34B	Bio-inspired Computing	3	0	0	3
III	22250E34C	Wireless Application Protocols	3	0	0	3

CREDITS DISTRIBUTION

Semester	Theory Courses		Elective Courses		Practical Courses		Total Credits
	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	05	**20**	01	**03**	01	**03**	26
II	03	**12**	02	**06**	02	**06**	24
III	01	**04**	03	**9**	01	**10**	23
IV	-	**-**	-	**-**	01	**15**	15
TOTAL							**88**

TOTAL CREDITS	
Semester – I	26
Semester – II	24
Semester – III	23
Semester – IV	15
TOTAL	**88**

22248S11A - HIGHER MATHEMATICS

L T P C
3 1 0 4

AIM

To extend student's mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

OBJECTIVES

At the end of the course, students would

- Have knowledge of the concepts needed to test the logic of a program.
- Have gained knowledge which has application in expert system, in data base and a basic for the prolog language.
- Have an understanding in identifying patterns on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
- Be exposed to concepts and properties of algebraic structures such as semigroups, monoids and groups.

UNIT I SETS, RELATIONS AND FUNCTIONS 9

Basic Concepts – Relationships between sets-Operations on sets-Principles of inclusion and exclusion – Min terms and Max terms of a set – Relations partial ordering relation-Equivalence relation-Binary relations-Cyclic order relation – a= (mod m) relations: Partitions sets – Hassee diagram- functions: Properties- Composition - inverse function

UNIT II LOGIC 9

Propositional logic – Logical connectivity's-Truth table-Normal forms(Connective and disjunctive)-Predicate logic-Universal and existential quantifiers induction.

UNIT III COMBINATORICS 9

Basic of counting - counting arguments - Pigeonhole principle - Permutations and combinations - Recursion and Recurrence relations - Generating functions.

UNIT IV MODELLING COMPUTATION AND LANGUAGES 9

Finite state Machines-Deterministic and Non-Deterministic finite state machines-Turing Machines-Formal Languages-Classes of Grammars-Type_0 – Context Sensitive-Context-Free-Regular Grammars-Ambiguity.

UNIT V LATICE AND BOOLEAN ALGEBRA 9

Partial order relation, poset-lattices, Hasse diagram-Boolean Algebra

Total No of periods: 45

REFERENCES

1. J.P.Tremblay and R.Manohar, " Discrete Mathematical Structures with Application to Computer Science", TMH,NY-1997
2. M.K.Venkatraman, N.Sridharan and N.Chandrasekaran, " Discrete Mathematics", The National Publishing Company,2003
3. K.H.Rosen, Discrete Mathematics and its Applications, Mc-Graw Hill Book, 1999.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	2	3	-	-	1
2	3	-	2	2	-	3
3	-	-	1	-	3	2
4	2	1	3	2	2	2
5	2	2	1	-	1	2
Avg	2	1.67	2	2	2	2

22250H12 - MODERN OPERATING SYSTEM

L T P C
4 0 0 4

AIM:

To have a thorough knowledge of processes, scheduling concepts, memory management, I/O and file systems, multimedia operating system and recent operating systems.

OBJECTIVES:

- To have an overview of different types of operating systems.
- To know the components of an operating system.
- To have a thorough knowledge of process management.
- To have a thorough knowledge of storage management.
- To know the concepts of I/O and file systems.
- To know the concepts of multimedia operating systems.

UNIT 1

Introduction-computer hardware review-operating system zoo-operating system concept-system call-Operating system Structure-Process and Threads: Processes-Threads-Interprocessor-Communication-Scheduling.

UNIT II

Memory Management Memory: Abstraction: Address, spaces, No memory Abstraction-Virtual Memory-Page Replacement Algorithm-Modeling Place Replacement Algorithm-Design Issue for paging system-Segmentation-File system: File Directives File System Implementation.

UNIT III

Deadlocks-Introduction to Deadlock-The Ostrich Algorithm-Deadlock Detection and Recovery-Deadlock Avoidance-Deadlock Preventation-Other Issues-Input/output Principles of I/O Hardware-Principle of I/O Software-I/O Software Layer-Disks-Locks-Thin Clients.

UNIT IV

Multiple Processor system-multiprocessor-multicomputer-virtualization-distributed system-multimedia Operating System-Multimedia files-video compression audio compression-multimedia scheduling-Disk scheduling for multimedia.

UNIT V

Case Study – LINUX, WINDOWS VISTA, SYMBIAN OS

Total: 45 hrs

TEXT BOOK:

1. Andrew S. Tanenbaum , "Modern Operating Systems " , Pearson Education , 3rd Edition , 2009

REFERENCE BOOKS:

1. Silberschatz, Galvin, Gagne " Operating System Concepts" Sixth Edition, 2003 .
2. Achut S. Godbole and KahateAtul , "Operating Systems & Systems Programming ", Tata Mcgraw Hill, 2003.
3. Charles Crowley, " Operating systems: A Design Oriented Approach", Tata McGraw Hill, 999.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	3	2	2	1	3
2	2	2	3	2	1	-
3	1	1	-	3	2	1
4	1	1	2	1	2	2
5	-	-	-	-	-	-
Avg	1.25	1.75	2.33	2.00	1.50	2.00

22250H13 - MACHINE LEARNING TECHNIQUES

L T P C4 0 0 4

AIM:

The main objective of this paper is to make the students to know the need of Machine Learning Techniques.

OBJECTIVES:

To introduce students to the basic concepts and techniques of Machine Learning.
To have a thorough understanding of the Supervised and Unsupervised learning techniques
To study the various probability based learning techniques
To understand graphical models of machine learning algorithms

UNITI INTRODUCTION 9

Learning – Types of Machine Learning – Supervised Learning – The Brain and the Neuron –Design a Learning System –Perspectives and Issues in Machine Learning – ConceptLearningTask–ConceptLearningasSearch–FindingaMaximallySpecificHypothesis– Version Spaces and the Candidate Elimination Algorithm – Linear Discriminants – Perceptron – Linear Separability–Linear Regression.

UNITII LINEARMODELS 9

Multi-layer Perceptron – Going Forwards – Going Backwards: Back Propagation Error – Multi-layer Perceptron in Practice – Examples of using the MLP – Overview – Deriving Back-Propagation–RadialBasisFunctionsandSplines–Concepts–RBFNetwork– Curse of Dimensionality–Interpolations and Basis Functions–Support Vector Machines.

UNITIII TREE ANDPROBABILISTICMODELS 9

Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Probability and Learning – Data into Probabilities – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms –Vector Quantization–Self Organizing Feature Map

UNITIV DIMENSIONALITYREDUCTIONANDEVOLUTIONARYMODELS 9

Dimensionality Reduction – Linear Discriminant Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Least Squares Optimization – Evolutionary Learning – Genetic algorithms – Genetic Offspring: - Genetic Operators – Using Genetic Algorithms – Reinforcement Learning – Overview – Getting Lost Example–Markov Decision Process

UNITV GRAPHICALMODELS 9

Markov ChainMonteCarloMethods–Sampling–ProposalDistribution–MarkovChainMonte Carlo– Graphical Models–Bayesian Networks–Markov Random Fields– Hidden Markov Models– Tracking Methods

Total: 45 hrs

REFERENCES:

1. Ethem Alpaydin,―IntroductiontoMachineLearning3e (Adaptive Computation and Machine Learning Series)‖, ThirdEdition,MITPress,2014

2. Jason Bell, ―Machine learning Handson forDevelopersandTechnicalProfessionals‖, First Edition, Wiley, 2014

3. PeterFlach, ―Machine Learning: TheArtandScienceofAlgorithmsthatMakeSenseofData‖, First Edition, Cambridge University Press,2012.

4. StephenMarsland,―MachineLearningAnAlgorithmicPerspective‖,Second Edition,ChapmanandHall/CRCMachineLearningandPatter nRecognitionSeries,2014.

5. Tom Mitchell,―Machine Learning‖,First Edition, McGrawHillEducation,2013.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	2	2	1	3	3	2
2	1	1	1	3	2	1
3	2	1	2	3	3	3
4	1	2	2	1	2	3
5	2	2	3	3	1	3
Avg	1.60	1.60	1.80	2.60	2.20	2.40

22250H14 –ADHOC AND SENSOR NETWORK

AIM: **L T P C**

4004

To understand the current and emerging applications of the adhoc sensor networks.

OBJECTIVE:

To understand

- A broad overview of the state of wireless and ad hoc networking.
- The overview of the physical, networking and architectural issues of ad hoc networks.
- The technologies that will enable the next generation of ad hoc networks and the proliferation of ubiquitous computing.
- The sensor networks and the unique set of design challenges that they introduce.

UNIT I AD-HOC MAC **9**

Introduction – Issues in Ad-Hoc Wireless Networks. MAC Protocols – Issues, Classifications of MAC protocols, Multi channel MAC & Power control MAC protocol.

UNIT II AD-HOC NETWORK ROUTING & TCP **9**

Issues – Classifications of routing protocols – Hierarchical and Power aware. Multicast routing – Classifications, Tree based, Mesh based. Ad Hoc Transport Layer Issues. TCP Over Ad Hoc – Feedback based, TCP with explicit link, TCP-BuS, Ad Hoc TCP, and Split TCP.

UNIT III WSN -MAC **9**

Introduction – Sensor Network Architecture, Data dissemination, Gathering. MAC Protocols – self-organizing, Hybrid TDMA/FDMA and CSMA based MAC.

UNIT IV WSN ROUTING, LOCALIZATION & QOS **9**

Issues in WSN routing – OLSR, AODV. Localization – Indoor and Sensor Network Localization. QoS in WSN.

UNIT V MESH NETWORKS **9**

Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic routing – Self configuration and Auto configuration – Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks.

Total : 45 hrs

REFERENCES:

1. C.Siva Ram Murthy and B.Smanoj, "Ad Hoc Wireless Networks – Architectures and Protocols", Pearson Education, 2004.
2. Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan Kaufman Publishers, 2004.
3. C.K.Toh, "Ad Hoc Mobile Wireless Networks", Pearson Education, 2002.
4. Thomas Krag and SebastinBuettrich, "Wireless Mesh Networking", O'Reilly Publishers, 2007.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	1	1	1	1	1
2	2	2	3	2	2	1
3	2	2	2		2	
4	1		3		3	1
5	2	2	2	1	2	
Avg	1.60	1.75	2.20	1.33	2.00	1.00

22250H15 - ADVANCED DATA STRUCTURES AND ALGORITHMS

L T P C
3 1 0 4

AIM:

To make the learners to understand the Analysis of algorithms and Data Structures.

OBJECTIVES :

To Understand

- The Different Heap Structures, Search Structures and Multimedia Structures.
- The various coding scheduling and algorithms.
- The various multimedia structures.

UNIT I FUNDAMENTALS : 9+3

Mathematical Induction -Asymptotic Notations –Properties of Big-oh Notation – Conditional Asymptotic Notation –Algorithm Analysis –Amortized Analysis –NP- Completeness –NP-Hard –Recurrence Equations –Solving Recurrence Equations –Memory Representation of Multi-dimensional Arrays –Time-Space Tradeoff.

UNIT II HEAP STRUCTURES : 9+3

Min/Max heaps –Deaps –Leftist Heaps –Binomial Heaps –Fibonacci Heaps –Skew Heaps –Lazy-Binomial Heaps.

UNIT III SEARCH STRUCTURE : 9+3

Binary Search Trees –AVL Trees –Red-Black trees –Multi-way Search Trees –B-Trees – Splay Trees –Tries.

UNIT IV MULTIMEDIA STRUCTURES : 9+3

Segment Trees –k-d Trees – Point Quad Trees –MX -Quad Trees – R-Trees –TV -Trees.

UNIT V ALGORITHMS : 9+3

Huffman Coding –Convex Hull –Topological Sort –Tree Vertex Splitting –Activity Networks – Flow Shop Scheduling –Counting Binary Trees –Introduction to Randomized Algorithms.

Total :60hrs

REFERENCES

1. E. Horowitz, S.Sahni and Dinesh Mehta, Fundamentals of Data structures in C++, University Press, 2007.
2. E. Horowitz, S. Sahni and S. Rajasekaran, Computer Algorithms/C++, Second Edition, University Press, 2007.
3. G. Brassard and P. Bratley, Algorithmics: Theory and Practice, Printice –Hall,1988.
4. V.S. Subramanian, Principles of Multimedia Database systems, Morgan Kaufman, 1998.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	2	2	3	1	3
2	3	1	-	-	2	3
3	3	-	1	1	-	2
4	3	2	1	-	2	1
5	3	3	1	1	-	1
Avg	3.00	2.00	1.25	1.67	1.67	2.00

22250L17 -ADVANCED WEB TECHNOLOGIES LAB

L T P C
0 0 3 3

1. Creation of HTML pages with frames, links, tables and other tags.
2. Usage of internal and external CSS along with HTML pages.
3. Client side Programming
    i. Java script for displaying date and comparing two dates.
    ii. Form Validation including text field, radio buttons, check boxes, list box and other controls.
4. Usage of ASP/JSP objects response, Request, Application, Session, Server, ADO etc.
    i. Writing online applications such as shopping, railway/air/bus ticket reservation system with set of ASP/JSP pages.
    ii. Using sessions and cookies as part of the web application.
5. Writing Servlet Program using HTTP Servlet.
6. Any online application with database access.
7. Creation of XML document for a specific domain.
8. Writing DTD or XML schema for the domain specific XML document.
9. Parsing an XML document using DOM and SAX Parsers.
10. Sample web application development in the open source environment.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	3	3	3	3	3
2	2	3	3	3	2	2
3	3	1	2	2	1	2
4	2	3	1	2	-	-
Avg	2.5	2.5	2.25	2.5	2	2.34

22250H21 - MIDDLEWARE TECHNOLOGIES

L T P C
3 1 0 4

AIM:

The aim of the course is to teach the role of middleware in the distributed environment and its common services.

OBJECTIVES:

- To study the set of services that a middleware system constitutes of.
- To understand how middleware facilitates the development of distributed applications in heterogeneous environments.
- To study how it helps to incorporate application portability, distributed application component interoperability and integration.
- To learn the object oriented middleware basics through the example of the following CORBA objects.
- To understand the basics of Web services that is the most often-used middleware technique.

UNIT – I **9+3**

Introduction : What is a distributed system- Client server Architecture – Multi-tier Architecture- Middleware - Classification of middleware- Event based middleware-Object based Middleware - Message based middleware and its Principal functions- Introduction to concepts of database middleware.

UNIT – II **9+3**

RPC & message Passing middleware - Introduction to procedure calls - Principles of RPC Architecture- Structure of Communication - Java RMI

UNIT – III **9+3**

Other middleware: Introduction to EJB- Introduction to JDBC &ODBC Interface Definition Language: Introduction to specification - IDL Identifiers-Attributes type correction -Classes- Arrays- Documentation -Any type-Modules -Interfaces- Exception handling -pre Compiler Directives -OO Design using IDL.

UNIT – IV **9+3**

CORBA**:** CORBA 2 Standard- Standard Object model- CORBA Architecture-CORBA Client and Object Implementation- Interface & Implementation repository-CORBA Services- Key Issues- Naming Services -Relationships- Event Services- life Cycle services- Object Query Services- properties Services-Time Services- CORBA facilities & CORBA Domains.

UNIT –V **9+3**

COM: Classes- Objects-Query Interface-Dynamic Composition-Apartments-In process Activation-server Lifetime-server lifetime-COM Security-Access Control-Token management-Introduction of DCOM

Total :60hrs

REFERENCE BOOKS:

1. Daniel Serian, “Middleware”, Springer Verlag, 1999.
2. Troy Bryan Downing, “Java RMI: Remote Method Invocation”, IDG Books India, 2000.
3. Thomas J Mowbray& William A Ruh, “Inside CORBA Distributed Objects and Application”, Addison Wesley, 1999.
4. Alan Pope, “CORBA Complete Reference Guide”, Addison Wesley, 1998.
5. Don Box, “Essential Com”, Addison Wesley, 1999

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	3	1	3	1	3
2	2	2	2	2	2	2
3	1	3	1	1	2	2
4	1	2	2	2	1	1
5	2		2	1	2	2
Avg	1.80	2.50	1.60	1.80	1.60	2.00

22250H22 - OBJECT ORIENTED SOFTWARE ENGINEERING

L T P C
4 0 0 4

AIM:

To learn the advanced software engineering principles and methodologies for Effective software development.

OBJECTIVES:

- To learn about software prototyping, analysis and design.
- To learn UML and its usage.
- Case studies to apply the principles.

UNIT – 1 INTRODUCTION **8**

Software Engineering Paradigms - Software Development process models - Project & Process - Project management – Process & Project metrics - Object Oriented concepts & Principles.

UNIT – 2 PLANNING & SCHEDULING **9**

Software prototyping - Software project planning – Scope – Resources - Software Estimation - Empirical Estimation Models-Planning-Risk Management - Software Project Scheduling – Object Oriented Estimation & Scheduling.

UNIT – 3 ANALYSIS & DESIGN **12**

Analysis Modeling - Data Modeling - Functional Modeling & Information Flow-Behavioral Modeling-Structured Analysis - Object Oriented Analysis - Domain Analysis-Object Oriented Analysis process - Object Relationship Model - Object Behaviour Model. Design Concepts & Principles - Design Process - Design Concepts - Modular Design –Design Effective Modularity - Introduction to Software Architecture - Data Design – Transform Mapping – Transaction Mapping – OOD - Design System design process- Object design process -Design Patterns.

UNIT – 4 IMPLEMENTATION & TESTING **8**

Top-Down, Bottom-Up, object oriented product Implementation& Integration. Software testing methods-White Box, Basis Path-Control Structure –Black Box-Unit Testing- Integration testing-Validation & System testing. Testing OOA & OOD models-Object oriented testing strategies.

UNIT – 5 MAINTENANCE 8

Maintenance process-System documentation-program evolution dynamics-Maintenance costs-Maintainability measurement – Case Studies. The laboratory shall include development of systems applying the Software Engineering principles and methods for specific applications.

Total: 45 hrs

TEXT BOOKS:

1. Roger S. Pressman, "Software Engineering a Practitioner's Approach" , Fifth Edition, Tata McGraw Hill.
2. Grady Booch, James Rumbaugh, Ivar Jacobson –"the Unified Modeling Language User Guide" – Addison Wesley,1999. (Unit III)

REFERENCE BOOKS:

1. Ian Sommerville, "Software Engineering", V Edition Addison- Wesley 1996.
2. PankajJalote "An Integrated Approach to Software Engineering" Narosa Publishing House 1991
3. Carlo Ghezzi Mehdi Jazayer, Dino Mandrioli "Fudamentals of Software Engineering" Prentice Hall of India 2002.
4. Fairley, "Software Engineering Concepts", Mc.Graw Hill 1985.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	3	3	3	3	3
2	2	3	3	3	2	2
3	3	1	2	2	1	2
4	2	3	1	2	-	-
Avg	2.5	2.5	2.25	2.5	2	2.34

22250H23 - INTERNET OF THINGS

L	T	P	C
4	0	0	4

AIM:

To introduce the student to various IOT techniques.

OBJECTIVES:

- To understand the fundamentals of Internet of Things
- To learn about the basics of IOT protocols
- To build a small low cost embedded system using Raspberry Pi.

UNITI INTRODUCTION TO IoT **9**

Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels &Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG-IoT Platforms Design Methodology

UNITII IoT ARCHITECTURE **9**

M2Mhigh-levelETSIarchitecture-IETFarchitectureforIoT-OGCarchitecture-IoTreference model-Domainmodel-informationmodel-functionalmodel-communicationmodel IoT reference architecture-To apply the concept of Internet of Things in the real world scenario.

UNIT III IOT PROTOCOLS **9**

Protocols standardization for Iot-Efforts-M2M and WSN Protocols-SCADA and RFID Protocols-Unified data Standard-Protocols-IEEE-802.15.4-BACNET Protocols-Modbus-ZigBee Architecture-Network layer-6LOWPAN-COAP-security.

UNIT IV BUILDING IOT WITH RASPBERRY &ARDUINO **9**

Building IOT with RASPERRY PI-IoT Systems - Logical Design using Python – IoT Physical Devices & Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi -RaspberryPi Interfaces –Programming RaspberryPi with Python- Other IoT Platforms- Arduino

UNIT V CASE STUDIES AND REAL WORLD APPLICATIONS **9**

Real world design constraints-Application-Asset management-Industrial automation-smart grid, commercial building automation, smart cities-software management Tools for Iot, cloud storage models& Communication APIs-Cloud for iot-Amazon web service for iot.

TOTAL: 45 PERIODS

REFERENCES:

1. ArshdeepBahga, Vijay Madisetti, ----Internet of Things—Ahands-on approach, Universities Press,2015.
2. Dieter Ucklemann, Mark Harrison, Michahelles, Florian(Eds),---Architecting the Internet of Things||,Springer,2011.
3. HonboZhou, --The Internet of Things in the Cloud: A Middleware Perspective||,CRCPress,2012.
4. Jan Ho"ller,Vlasios Tsiatsis,Catherine Mulligan, Stamatis, Karnouskos,Stefan Aves and David Boyle,"From Machine-to-Machine to the Internet of Things-Introduction to a New Age of Intelligence",Elsevier,2014.
5. Olivier Hersent, David Boswarthick, Omar Elloumi,---The Internet of Things--- Key Key application and Protocols||,Wiley,2012.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	1	2	1	1	3
2	3	2	1	2	3	2
3	1	1	2	1	3	3
4	2	3	2	1	2	2
5	1	2	1	2	1	1
Avg	1.60	1.80	1.60	1.40	2.00	2.20

22250L26 - .NET TECHNOLOGIES LAB **L T P C**
0 0 3 3

Develop the following in ASP .NET or VB.NET.

1. Query textbox and Displaying records
2. Display records by using database
3. Data list link control
4. Databinding using drop down list control
5. Datagrid paging

Develop the following in C#.NET.

1. Demonstrate Use Of Virtual and override keyword in C# with a simple Program.
2. Write a Program in C# to implement Stack operations.
3. Write a Program to demonstrate Operator overloading.
4. Demonstrate arrays of interface types with a C# program.
5. Write a Program in C# to build a class which implements an interface which already exists.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	-	3	2	3	2
2	2	2	3	1	1	1
3	3	-	3	2	2	2
4	1	2	3	1	1	1
5	2	-	3	2	2	1
Avg	2.20	2.00	3.00	1.60	1.80	1.40

L T P C
4 0 0 4

22250H31 - SOFTWARE PROJECT MANAGEMENT

AIM:

Software Project Management provides insight to the importance of careful project management

OBJECTIVES:

- Understand Project planning and management.
- Identify Client management and project definition.
- Understand testing based approach to development.
- Team management and ongoing schedule tracking.

UNIT I FUNDAMENTALS 9

Conventional Software Management – Evolution of Software Economics – Improving Software Economics – Conventional versus Modern Software Project Management.

UNIT II SOFTWARE MANAGEMENT PROCESS FRAMEWORK 9

Lifecycle Phases – Artifacts of the Process – Model Based Software Architectures – Workflows of the Process – Checkpoints of the Process.

UNIT III SOFTWARE MANAGEMENT DISCIPLINES 9

Iterative Process Planning – Organization and Responsibilities – Process Automation – Process Control and Process Instrumentation – Tailoring the Process.

UNIT IV MANAGED AND OPTIMIZED PROCESS 9

Data Gathering and Analysis – Principles of Data Gathering – Data Gathering Process – Software Measures – Data Analysis – Managing Software Quality – Defect Prevention.

UNIT V CASE STUDIES 9

COCOMO Cost Estimation Model – Change Metrics – CCPDS–R.

Total: 45hr

3.

TEXTBOX:

1. Walker Royce "Software Project Management A Unified Framework", Pearson Education, 2004
2. Humphrey Watts, "Managing the software process", Addison Wesley, 1989. (Unit IV)

REFERENCES:

1. Ramesh Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Bob Hughes, Mikecotterell, "Software Project Management", 3rd Edition, Tata cGraw Hill, 2004

.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	3	3	3	2	3
2	2	2	2	3	2	3
3	3	1	1	2	1	3
4	2	2	2	3	2	1
5	1	1	1	3	1	2
Avg	2.20	1.80	1.80	2.80	1.60	2.40

SEMESTER – I - ELECTIVE – I
22250E16A - MULTIMEDIA SYSTEMS

L	T	P	C
4	0	0	4

AIM:

To impart knowledge on Multimedia system and design.

OBJECTIVES:

- To study the graphics techniques and algorithms.
- To study the multimedia concepts and various I/O technologies

UNIT 1 Introduction **9**

Line - Curve and Ellipse Drawing Algorithms – Attributes – Two-Dimensional Geometric Transformations – Two-Dimensional Clipping and Viewing.

UNIT II Three-Dimensional Concepts **9**

Three-Dimensional Object Representations – Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing – Color models – Animation.

UNIT III Multimedia Systems Design **9**

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

UNIT IV Multimedia File Handling **9**

Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval Technologies.

UNIT V Hypermedia **9**

Multimedia Authoring & User Interface – Hypermedia messaging - Mobile Messaging – Hypermedia message component – Creating Hypermedia message – Integrated multimedia message standards – Integrated Document management – Distributed Multimedia Systems.

Total: 45 Hours

REFERENCES:

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003. (UNIT I : Chapters 1 to 6; UNIT 2: Chapter 9 – 12, 15, 16)
2. Prabat K Andleigh and KiranThakrar, "Multimedia Systems and Design", PHI, 2003.(UNIT 3 to 5)
3. Judith Jeffcoate, "Multimedia in practice technology and Applications", PHI, 1998.
4. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education, second edition 2003.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	2	3	4	5	6
2	1	1	1	2	1	2
3	2	1	-	-	2	2
4	1	-	2	1	1	2
5	2	1	1	1	2	2
	3	1	2	1	2	3
Avg	1.80	1.00	1.50	1.25	1.60	2.20

22250E16B-WEB ENGINEERING

OBJECTIVES:

- Understand the characteristics of web applications
- Learn to Model web applications
- Be aware of Systematic design methods
- Be familiar with the testing techniques for web applications

UNITI INTRODUCTIONTOWEBENGINEERING 9

Motivation, Categories of Web Applications, Characteristics of Web Applications. Requirements of Engineering in Web Applications- Web Engineering-Components of Web Engineering- Web Engineering Process-Communication-Planning.

UNITII WEB APPLICATION ARCHITECTURES & MODELLING WEBAPPLICATIONS 9

Introduction-Categorizing Architecture-Specific of Web Application Architecture Components of Generic Web application –Layered Architecture,2-Layer Architecture, N-centric Architecture-Architecture for web document Management-Architecture for Multimedia Data-Modelings specifics in web Engineering, Levels, Aspects, Phases Customization, Modeling Requirements, Hypertext Modeling, Hypertext Structure Modeling Concept, Relation to content Modeling, Presentation Modeling, Relation to Hypertext Modeling, Customization Modeling, Modelling Framework-Modeling Language-Analysis Modeling for web Apps-The content Model-The Interaction Model –Configuration Model.

UNITIII WEB APPLICATION DESIGN 9

Design for Web Apps- Goals-Design Process-Interactive Design- Principles and Guidelines-Workflow-Preliminaries-DesignSteps-Usability-Issues-InformationDesign- Information Architecture- structuring- Accessing Information-Navigation Design- Functional Design-Web App Functionality-Design Process-Functional Architecture- Detailed Functional Design.

UNITIV TESTINGWEBAPPLICATIONS 9

Introduction-Fundamentals-TestSpecificsinWebEngineering-TestApproaches-ConventionalApproaches,AgileApproaches-Testingconcepts-TestingProcess-TestScheme-Test Methods and Techniques- Link Testing- Browser Testing-Usability Testing-Load, Stress, and Continuous Testing, Testing Security, Test-driven Development, -ContentTesting-UserInterfacetesting-UsabilityTesting-CompatibilityTesting- Component Level Testing-Navigation-Testing-Configurationtesting-Security 5and Performance Testing- Test Automation.

UNITV PROMOTINGWEBAPPLICATIONS ANDWEBPROJECT MANAGEMENT **9**

Introduction-challengesinlaunchingthewebApplication-PromotingWebApplication-ContentManagement-UsageAnalysis-WebProjectManagement-ChallengesinWebProject Management-Managing Web Team- Managing the Development Process of a Web Application- Risk, Developing a Schedule, Managing Quality, Managing Change, Tracking the Project. Introduction to node JS-web sockets.

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of this course, the student should able to:

- Explain the characteristic of web application.
- Model web application.
- Design Web application.
- Test web application.

REFERENCES:

1. Adam Drozdex, “Data Structures and algorithms in C++”, Cengage Learning, 4th Edition, 2013.
2. T.H. Cormen, C.E.Leiserson, R.L. Rivest and C.Stein, "Introduction to Algorithms", Prentice Hall of India, 3rd Edition, 2012.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	2	3	-	-	1
2	3	-	2	2	-	3
3	-	-	1	-	3	2
4	2	1	3	2	2	2
5	2	2	1	-	1	2
Avg	2	1.67	2	2	2	2

22250E24A- ADVANCES DISTRIBUTED COMPUTING **L T P C**

4 0 0 4

AIM:

TO introduce an integrated approach to software development incorporating quality management methodologies.

UNIT I MEASUREMENTS THEORY **9**

Measurements In Software Engineering - Scope Of Software Metrics - Measurements Theory - Goal Based Framework – Software Measurement Validation.

UNIT II DATA COLLECTION AND ANALYSIS **9**

Empirical Investigation - Planning Experiments - Software Metrics Data Collection - Analysis Methods – Statistical Methods.

UNIT III PRODUCTS METRICS **9**

Measurement of Internet Product Attributes - Size and Structure - External Product Attributes - Measurement of Quality.

UNIT IV QUALITY METRICS **9**

Software Quality Metrics - Product Quality - Process Quality - Metrics for Software Maintenance - Case Studies of Metrics Program - Motorola - Hp And IBM.

UNIT V MANAGEMENT METRICS **9**

Quality Management Models - Rayleigh Model - Problem Tracking Report (PTR) Model - Reliability Growth Model - Model Evaluation - Orthogonal Classification.

REFERENCES:

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, Seventh Edition, Pearson Education 2016.
2. Henry F. Korth, Abraham Silberschatz, S. Sudharshan, “Database System Concepts”, Seventh Edition, McGraw Hill, 2019.
3. C.J.Date, A.Kannan, S.Swamynathan, “An Introduction to Database Systems, Eighth Edition, Pearson Education, 2006
4. Raghu Ramakrishnan , Johannes Gehrke “Database Management Systems”, Fourth Edition, McGraw Hill Education, 2015.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	2	2	3	1	3
2	3	1	-	-	2	3
3	3	-	1	1	-	2
4	3	2	1	-	2	1
5	3	3	1	1	-	1
Avg	3.00	2.00	1.25	1.67	1.67	2.00

SEMESTER – II - ELECTIVE – II
2250E24A-ADVANCES DISTRIBUTED COMPUTING

L T P C
4004

AIM:

This course discusses the depth concepts of distributed computing and its features.

OBJECTIVES:

Understanding the concepts of

- Processing, distributed systems, operating system issues.
- learn about distributed transaction
- study about the distributed databases.

UNIT-I INTRODUCTION **9**

Characterization of Distributed Systems - Examples - Resource Sharing and the Web - Challenges – System Models - Architectural and Fundamental Models - Networking and Internetworking - Types of Networks - Network Principles - Internet Protocols - Case Studies: Ethernet, WiFi.

UNIT-II PROCESSES AND DISTRIBUTED OBJECTS **9**

Inter process Communication - The API for the Internet Protocols - External Data Representation and Marshalling - Client-Server Communication - Group Communication - Case Study: Interprocess communication in UNIX - Distributed Objects and Remote Invocation - Communication Between Distributed Objects - Remote Procedure Call - Events and Notifications - Case Study: Java RMI.

UNIT-III OPERATING SYSTEM ISSUES **9**

The OS Layer - Protection - Processes and Threads - Communication and Invocation – OS Architecture - Security - Overview - Cryptographic Algorithms - Digital Signatures - Cryptography Pragmatics – Case Studies Kerberos, 802.11 WiFi - Distributed File Systems - File Service Architecture - Sun Network File System - Distributed Debugging - Distributed Mutual Exclusion – Elections – Multicast Communication Related Problems.

UNIT-IV DISTRIBUTED TRANSACTION PROCESSING **9**

Transactions - Nested Transactions - Locks - Optimistic Concurrency Control - Timestamp Ordering - Comparison - Flat and Nested Distributed Transactions - Atomic Commit Protocols - Concurrency Control in Distributed Transactions - Transaction Recovery - Overview of Replication And Distributed Multimedia Systems.

UNIT-V DISTRIBUTED DATABASES **9**

Features of Distributed versus Centralized Databases -Principles of Distributed Databases -Levels of Distribution Transparency -Reference Architecture for Distributed Databases - Types of Data Fragmentation - Integrity Constraints in Distributed Databases.

Total : 45 hrs

TEXT BOOKS :

1 George Coulouris, Jean Dollimore and Tim Kindberg, "Distributed Systems Concepts and Design", Pearson Education, 4th Edition, 2005.

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw -Hill

REFERENCES:

1 SapeMullender, "Distributed Systems", Addison Wesley, 2 nd Edition, 1993.

2 Albert Fleishman, "Distributes Systems - Software Design and Implementation", Springer -Verlag, 1994.

3 M.L.Liu, "Distributed Computing Principles and Applications", Pearson Education, 2004.

4 Andrew S Tanenbaum, Maartenvan Steen,"Distibuted Systems –Principles and Pardigms",Pearson Education, 2002.

5 MugeshSinghal,Niranjan G Shivaratri,"Advanced Concepts in Operating Systems",Tata McGraw Hill Edition, 2001.

6. Principles of Distributed Database Systems, M.TamerOzsu, Patrick Valduriez –Pearson Education

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	2	2	3	1	3
2	3	1	-	-	2	3
3	3	-	1	1	-	2
4	3	2	1	-	2	1
5	3	3	1	1	-	1
Avg	3.00	2.00	1.25	1.67	1.67	2.00

22250E24B- DATA WAREHOUSING & DATA MINING

L T P C
4 0 0 4

AIM:

To serve the students with an emphasis on the design aspects of Data Mining and Data Warehousing.

OBJECTIVES:

- To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification, clustering and association rules are exhaustively dealt with.
- To introduce the concept of data warehousing with special emphasis on architecture and design.

UNIT-I INTRODUCTION 9

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining, Data Warehousing and Business Analysis: - Data warehousing Components –Building a Data warehouse – Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata – reporting – Query tools and Applications – Online Analytical Processing (OLAP) – OLAP and Multidimensional Data Analysis.

UNIT-II DATA MINING AND ASSOCIATION RULE MINING 9

Data Mining: - Data Mining Functionalities – Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.
Association Rule Mining: - Efficient and Scalable Frequent Item set Mining Methods –
Mining Various Kinds of Association Rules – Association Mining to Correlation Analysis
– Constraint-Based Association Mining.

UNIT-III CLASSIFICATION AND PREDICTION 9

Classification and Prediction: - Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT IV CLUSTER ANALYSIS 9

Cluster Analysis: - Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods – Density-Based Methods – Grid-Based Methods – Model-Based Clustering Methods – Clustering High- Dimensional Data – Constraint-Based Cluster Analysis – Outlier Analysis.

UNIT V MINING OTHER DATA 9

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web.

TOTAL = 45HRS

REFERENCES:

1. Jiawei Han and Micheline Kamber "Data Mining Concepts and Techniques" Second Edition, Elsevier, Reprinted 2008.

2. Alex Baron and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.

2. K.P. Soman, ShyamDiwakar and V. Ajay "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.

3. G. K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.

4. Pang-Ning Tan, Michael Steinbach and Vipin Kumar "Introduction to Data Mining", Pearson Education, 2007.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	-	-	2	2	3	2
2	3	2	3	-	-	-
3	2	-	-	2	3	3
4	3	3	-	2	3	3
5	2	3	3	2	3	3
Avg	2.5	2.7	2.7	2	3	2.75

22250E24C- INFORMATIONRETRIEVALTECHNIQUES

L	T	P	C
4	0	0	4

OBJECTIVES:

- To understand the basics of information retrieval with pertinence to modeling, query operations and indexing.
- To get an understanding of machine learning techniques for text classification and clustering.
- To understand the various application of information retrieval giving emphasis to multimedia IR, web search.
- To understand the concept of digital libraries.

UNITI INTRODUCTION:MOTIVATION 9

Basic Concepts – Practical Issues - Retrieval Process – Architecture - Boolean Retrieval – RetrievalEvaluation–OpenSourceIRSystems–HistoryofWebSearch–WebCharacteristics– TheimpactofthewebonIR—IRVersusWebSearch–ComponentsofaSearchengine

UNITII MODELING 9

Taxonomy and characterization of IR Models-Boolean Model-Vector Model-Term Weighting-Scoring and Ranking-Language Models-Set Theoretic Models-Probabilistic Models-Algebraic Models-Structural Text Retrievel Model-Model for Browsing.

UNITIII INDEXING 9

Static and Dynamic Inverted Indices–Index Construction and Index Compression. Searching-Sequential Searching and Pattern Matching. Query Operations -Query Languages – Query Processing - Relevance Feedback and Query Expansion - Automatic Local and Global Analysis –Measuring Effectiveness and Efficiency

UNITIV CLASSIFICATIONANDCLUSTERING 9

Text Classification and Naïve Bayes –Vector Space Classification SupportvectormachinesandMachinelearningondocuments.FlatClustering– Hierarchical Clustering–Matrix decompositions and latent semantic indexing– Fusion and Meta learning

UNITV SEARCHINGTHEWEB 9

Searching the Web –Structure of the Web –IR and web search – Static and Dynamic Ranking –Web Crawling and Indexing – Link Analysis - XML Retrieval Multimedia IR: Models andLanguages–IndexingandSearchingParallelandDistributedIR–DigitalLibraries

TOTAL: 45PERIODS

OUTCOMES:

Upon completion of this course, the students should be able to:

- Build an Information Retrieval system using the available tools.
- Identify and design the various components of an Information Retrieval system.
- Apply machine learning techniques to text classification and clustering which is used for efficient Information Retrieval.
- Design an efficient search engine and analyze the Web content structure.

REFERENCES:

1. ChristopherD.Manning, Prabhakar Raghavan, HinrichSchutze, ―IntroductiontoInformation Retrieval‖, Cambridge University Press, First SouthAsianEdition,2008.
2. Implementing and Evaluating Search Engines‖, The MIT Press, Cambridge, Massachusetts London, England,2010
3. Ricardo Baeza–Yates, Berthier Ribeiro– Neto,―Modern Information Retrieval: The concepts and Technology behind Search‖(ACMPressBooks),Second Edition,2011.
4. StefanButtcher,CharlesL.A.Clarke,GordonV.Cormack,―InformationRetrieval

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	2	2	1	3	3	2
2	1	1	1	3	2	1
3	2	1	2	3	3	3
4	1	2	2	1	2	3
5	2	2	3	3	1	3
Avg	1.60	1.60	1.80	2.60	2.20	2.40

22250E25A **AIM:**

- SERVICE ORIENTED ARCHITECTURE

To familiarize the students with the concepts of service oriented architectures. (SOA).

OBJECTIVES:

- Understand SOA, service orientation and web services
- Analyzing and designing business based on SOA principles.
- Learning the concepts of XML.

UNIT I **9**

Software Architecture – Types of IT Architecture – SOA – Evolution – Key components – perspective of SOA – Enterprise-wide SOA – Architecture – Enterprise Applications – Solution Architecture for enterprise application – Software platforms for enterprise Applications – Patterns for SOA – SOA programming models.

UNIT II **9**

Service-oriented Analysis and Design – Design of Activity, Data, Client and business process services – Technologies of SOA – SOAP – WSDL – JAX – WS – XML WS for .NET – Service integration with ESB – Scenario – Business case for SOA – stakeholder objectives – benefits of SPA – Cost Savings

UNIT III **9**

SOA implementation and Governance – strategy – SOA development – SOA governance – trends in SOA – event-driven architecture – software s a service – SOA technologies – proof-of-concept – process orchestration – SOA best practices

UNIT IV **9**

Meta data management – XML security – XML signature – XML Encryption – SAML – XACML – XKMS – WS-Security – Security in web service framework – advanced messaging

UNIT V **9**

Transaction processing – paradigm – protocols and coordination – transaction specifications – SOA in mobile – research issues

Total: 45 hrs

REFERENCES:

1. Shankar Kambhampaly, "Service –Oriented Architecture for Enterprise Applications", Wiley India Pvt Ltd, 2008.
2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education.
3. Mark O' Neill, et al. , "Web Services Security", Tata McGraw-Hill Edition, 2003.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	2	1	3	1	1
2	2	3	1	2	1	2
3	1	1	2	1	-	2
4	2	2	-	-	-	3
5	3	3	1	1	1	3
Avg	1.80	2.20	1.25	1.75	1.00	2.20

22250E25B - HIGH SPEED NETWORKS **L T P C**
4 0 0 4

AIM:

To study the various performance and analysis issues involved in high-speed data transmission.

OBJECTIVES:

Be able to

- Describe and interpret the basics of high speed networking technologies.
- Apply the concept learnt in this course to optimize and troubleshoot high-speed network.
- Demonstrate the knowledge of network planning and optimization

UNIT - 1: HIGH SPEED NETWORKS **9**

Frame Relay Networks - Asynchronous transfer mode - ATM Protocol Architecture, ATM logical Connection, ATM Cell - ATM Service Categories - AAL. High Speed LANs: Fast Ethernet, Gigabit Ethernet, Fiber Channel - Wireless LANs: applications, requirements - Architecture of 802.11

UNIT - 2: CONGESTION AND TRAFFIC MANAGEMENT **9**

Queuing Analysis- Queuing Models - Single Server Queues - Effects of Congestion - Congestion Control - Traffic Management - Congestion Control in Packet Switching Networks - Frame Relay Congestion Control.

UNIT - 3: TCP AND ATM CONGESTION CONTROL **9**

TCP Flow control - TCP Congestion Control - Retransmission - Timer Management - Exponential RTO back off - KARN's Algorithm - Window management - Performance of TCP over ATM. Traffic and Congestion control in ATM - Requirements - Attributes - Traffic Management Frame work, Traffic Control - ABR traffic Management - ABR rate control, RM cell formats, ABR Capacity allocations - GFR traffic Management.

UNIT - 4: INTEGRATED AND DIFFERENTIATED SERVICES **9**

Integrated Services Architecture - Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ - Random Early Detection, Differentiated Services

UNIT - 5: PROTOCOLS FOR QOS SUPPORT **9**

RSVP - Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms - Multiprotocol Label Switching - Operations, Label Stacking, Protocol details - RTP - Protocol Architecture, Data Transfer Protocol, RTCP.

Total: 45 hr.

TEXT BOOK:

1. William Stallings, "HIGH SPEED NETWORKS AND INTERNET", Pearson Education, Second Edition, 2002.

REFERENCES:

1. Warland&PravinVaraiya, "HIGH PERFORMANCE COMMUNICATION NETWORKS", Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.
2. IrvanPepelnjk, Jim Guichard and Jeff Apcar, "MPLS and VPN architecture", Cisco Press, Volume 1 and 2, 2003

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	3	2	-	1	-
2	1	3	3	3	-	1
3	1	3	3	2	2	2
4	1	2	2	1	2	1
5	1	3	1	1	1	2
Avg	1.00	2.80	2.20	1.75	1.50	1.50

22250E25C- LANGUAGETECHNOLOGIES

L	T	P	C
4	0	0	4

OBJECTIVES:

- To learn the fundamentals of natural language processing
- To appreciate the use of CFG and PCFG in NLP
- To understand the role of semantics and pragmatics

UNITI INTRODUCTION 9

Words-RegularExpressionsandAutomata-WordsandTransducers-N-Grams-Part-of-Speech– Tagging-Hidden Mark and Maximum Entropy Models.

UNITII SPEECH 9

Speech-Phonetics-Speech Synthesis-Automation Speech Recognition-Speech Recognition-Advanced Topics-Computational Phonology.

UNITII SYNTAX 9

Formal Grammars of English-Syntactic Parsing-Statistical Parsing-Features and Unification – Language and Complexity.

UNITIV SEMANTICS AND PRAGMATICS 9

The Representation of Meaning-Computational Semantics-Lexical Semantic-Computational Lexical Semantic-Computational Discourse.

UNIT V APPLICATION 9

Information Extraction-Question Answering and Summarization- Dialogue and Conversational Agents-Machine Translation.

TOTAL:45PERIODS

OUTCOMES:

Upon completion of this course, the students should be able to:

- To tag a given text with basic Language features
- To design an innovative application using NLP components
- To implement a rule based system to tackle morphology/syntax of a language
- To design a tag set to be used for statistical processing for real-time applications
- To compare and contrast use of different statistical approaches for different types of NLP applications.

REFERENCES:

1. Breck Baldwin, "Language Processing with Java and Ling Pipe Cookbook", AtlanticPublisher,2015.
2. DanielJurafsky,"SpeechandLanguageProcessing:An Introduction to Natural Language Processing, Computational Linguistics and Speech", Pearson Publication,2014.
3. NitinIndurkhya and Fred J. Damerau, "Handbook of Natural Language Processing", Second Edition, Chapmanand Hall/CRCPress,2010.
4. Richard M Reese," Natural Language Processing withJava",O_ReillyMedia,2015.
5. Steven Bird, Ewan Klein and Edward Loper, -"Natural Language Processing withPython",FirstEdition,O_ReillyMedia,2009.

22250E32A - CLOUD COMPUTING **L T P C**
4 0 0 4

AIM:

To acquire basic knowledge on cloud computing and its applications.

OBJECTIVES:

- Identify cloud computing models, characteristics, and technologies.
- Get knowledge about the different architectures in cloud.
- Identify the information about service management and cloud securities.

UNIT-I **9**

Overview of Computing Paradigm- Recent trends in Computing - Evolution of cloud computing - Introduction to Cloud Computing -Cloud Computing (NIST Model)- Properties, Characteristics & Disadvantages - Cloud computing vs. Cluster computing vs. Grid computing - Role of Open Standards

UNIT-II **9**

Cloud Computing Architecture - Cloud computing stack - Service Models (XaaS) - Infrastructure as a Service(IaaS) - Platform as a Service(PaaS) - Software as a Service(SaaS)- Deployment Models

UNIT-III **9**

Infrastructure as a Service(IaaS) - Introduction to IaaS - Resource Virtualization – Examples. Platform as a Service(PaaS) - Introduction to PaaS - Cloud Platform and Management –Examples - Software as a Service(SaaS) - Introduction to SaaS

UNIT-IV **9**

Service Management in Cloud Computing - Service Level Agreements(SLAs)- Identity & Access Management - Access Control - Trust, Reputation, Risk - Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations - Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations.

UNIT-V **9**

Cloud Security - Infrastructure Security - Network level security - Host level security - Application level security - Data security and Storage - Data privacy and security Issues, Jurisdictional issues raised by Data location - Case Study on Open Source & Commercial Clouds – Eucalyptus - Microsoft Azure - Amazon EC2.

Total:45hrs

REFERENCE BOOKS:

1. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010
2. Cloud Computing: Principles and Paradigms, Editors: RajkumarBuyya, James Broberg, Andrzej M. Goscinski, Wile, 2011
3. Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012
4. Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley-India, 2010

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	-	-	-	2	2	1
2	2	3	1	-	-	1
3	3	-	3	-	1	3
4	-	-	-	2	-	3
5	3	2	-	-	-	-
Avg	2.6	2.5	2	2	1.5	2

AIM: **22250E32B - SPEECH PROCESSING AND SYNTHESIS**

L	T	P	C
4	0	0	4

To study about the Speech Processing and Synthesis

OBJECTIVES

- To understand the mathematical foundations needed for speech processing
- To understand the basic concepts and algorithms of speech processing and synthesis
- To familiarize the students with the various speech signal representation, coding and recognition techniques
- To appreciate the use of speech processing in current technologies and to expose the students to real– world applications of speech processing.

UNIT I FUNDAMENTALSOFSPEECHPROCESSING 9

Introduction – Spoken Language Structure – Phonetics and Phonology – Syllables and Words–Syntax and Semantics–Probability, Statistics and Information Theory– ProbabilityTheory–EstimationTheory–SignificanceTesting–InformationTheory.

UNIT II SPEECH SIGNAL REPRESENTATIONS AND CODING 9

Overview of Digital Signal Processing-Speech Signal Representation- Short time Fourier Analsysis-Acoustic Model of Speech Presentation- Linear Predictive Coding-Cepstral Processing- Format Frequency-The Role of Pitch-Speech coding-LPC Coder.

UNIT III SPEECH RECOGNITION 9

Hidden Markov Models-Definition-Continuous and Discontinuous HMMs-Practical Issues-Limitation Acoustic Modeling-Variable in the Speech Signal-Extracting Features-Phonetics Modeling-Adaptive Techniques-Confidence Measures-Other Techniques.

UNIT IV TEXT ANALYSIS 9

Lexicon – Document Structure Detection – Text Normalization – Linguistic Analysis –Homograph Disambiguation–Morphological Analysis–Letter-to-sound Conversion– Prosody–Generationschematic–SpeakingStyle–SymbolicProsody–Duration Assignment– Pitch Generation

UNIT V SPEECH SYNTHESIS 9

Attributes–FormantSpeechSynthesis–ConcatenativeSpeechSynthesis–Prosodic Modification of Speech–Source-filter Models for Prosody Modification– Evaluation of TTS Systems.

REFERENCES:

- Joseph Mariani, ―Language and Speech Processing‖, Wiley,2009.
- Lawrence Rabiner and Biing]Hwang Juang,―Fundamentals of speech Recognition ‖,Prentice Hall Signal ProcessingSeries,1993
- SadakiFurui, --- Digital Speech Processing: Synthesis, and Recognition, Second Edition Signal Processing and Communication) ||, Marcel Dekker,2000.
- Thomas F. Quartier, ---Discrete-TimeSpeechSignal Processing||, Pearson Education,2002.
- XuedongHuang,AlexAcero,Hsian-Wuen Hon,---Spoken Language Processing—A guideto Theory, Algorithm and System Development||,Prentice HallPTR,2001.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	1	3	-	2	3
2	2	1	-	2	1	3
3	3	1	2	3	2	3
4	-	2	2	-	1	3
5	2	2	-	3	3	3
Avg	2.00	1.40	2.33	2.67	1.80	3.00

22250E32C - SOFT COMPUTING

L T P C
4 0 0 4

AIM:

To understand the concepts of Artificial Intelligence, ANN , Genetic Algorithms and Fuzzy systems and its applications.

OBJECTIVES:

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- To introduce the ideas of Neural networks, fuzzy logic and use of heuristics base on human experience.
- To have a general understanding of soft computing methodologies, including artificial neural networks, fuzzy sets, fuzzy logic, fuzzy clustering techniques and genetic algorithms;
- To Design and development of certain scientific and commercial application using computational neural network models, fuzzy models, fuzzy clustering applications and genetic algorithms in specified applications.

UNIT-I FUZZY SET THEORY **10**

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set–Theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT-II OPTIMIZATION **8**

Derivative based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative Free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT-III NEURAL NETWORKS **10**

Supervised Learning Neural Networks – Perceptrons – Adaline – Backpropagation Multilayer perceptrons – Radial Basis Function Networks – Unsupervised Learning and Other Neural Networks – Competitive Learning Networks – Kohonen Self – Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT-IV NEURO FUZZY MODELING **9**

Adaptive Neuro – Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework – Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT-V APPLICATION OF COMPUTATIONAL INTELLIGENCE 8

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

Total: 45 hrs

TEXTBOOK:

1. J. S. R. Jang, C. T. Sun and E. Mizutani, "Neuro Fuzzy and Soft Computing", PHI, Pearson Education, 2004.

REFERENCES:

1. Timothy J. Ross," Fuzzy Logic with Engineering Application ", McGraw Hill, 1977.
2. Davis E. Goldberg," Genetic Algorithms Search, Optimization and Machine Learning", Addison Wesley, 1989.
3. S. Raja sekaran and G. A. V. Pai, " Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.
4. R. Eberhart, P. Simpson and R. Dobbins, " Computational Intelligence PC Tools", AP Professional, Boston, 1996.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	3	1	3	1	3
2	2	2	2	2	2	2
3	1	3	1	1	2	2
4	1	2	2	2	1	1
5	2		2	1	2	2
Avg	1.80	2.50	1.60	1.80	1.60	2.00

22250E33A – ADVANCED DATABASE TECHNOLOGY

L	T	P	C
4	0	0	4

AIM:

To prepare the student to understand, develop, and manage more advanced database applications.

OBJECTIVES:

Be able to

Know the operations of parallel and distributed databases.
Understand the structure s and standards of object relational databases.
Get familiar with the concepts of XML, Mobile and Multimedia Databases.

UNIT-I PARALLEL AND DISTRIBUTED DATABASES 9

Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Three Tier Client Server Architecture- Case Studies.

UNIT-II OBJECT AND OBJECT RELATIONAL DATABASES 9

Concepts for Object Databases: Object Identity – Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects – Object Database Standards, Languages and Design: ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems : Object Relational features in SQL/Oracle – Case Studies.

UNIT-III XML DATABASES 9

XML Databases: XML Data Model – DTD - XML Schema - XML Querying – Web Databases – JDBC – Information Retrieval – Data Warehousing – Data Mining

UNIT-IV MOBILE DATABASES 9

Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management - Location Dependent Data Distribution - Mobile Transaction Models - Concurrency Control - Transaction Commit Protocols- Mobile Database Recovery Schemes.

UNIT-V MULTIMEDIA DATABASES 9

Multidimensional Data Structures – Image Databases – Text/Document Databases- Video Databases – Audio Databases – Multimedia Database Design.

Total = 45 hrs

REFERENCES:

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education/Addison Wesley, 2007.
2. Thomas Cannolly and Carolyn Begg, " Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.
3. Henry F Korth, Abraham Silberschatz, S. Sudharshan, "Database System Concepts", Fifth Edition, McGraw Hill, 2006.
4. C.J. Date, A. Kannan and S.Swaminathan," An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	2	2	1	3	1	2
2	2		-	2		
3	3	1	2	1	-	1
4	3	2	2	1	1	1
5	2	3	1	1	-	1
Avg	2.40	2.00	1.50	1.60	1.00	1.20

22250E33B - RECONFIGURABLE COMPUTING

L	T	P	C
4	0	0	4

AIM:

To understand about the Reconfigurable Computing.

OBJECTIVES:

- To understand the need for reconfigurable computing
- To expose the students to various device architectures
- To examine the various reconfigurable computing systems
- To understand the different types of computer models for programming reconfigurable architectures
- To expose the students to HDL programming and familiarize with the development
- environment
- To expose the students to the various placement and routing protocols
- To develop applications with FPGAs

.

UNITI DEVICEARCHITECTURE **9**

GeneralPurposeComputingVsReconfigurableComputing–SimpleProgrammableLogicDevices–ComplexProgrammableLogicDevices–FPGAs–DeviceArchitecture-CaseStudies.

UNITII RECONFIGURABLECOMPUTINGARCHITECTURESANDSYSTEMS **9**

ReconfigurableProcessingFabricArchitectures–RPFIntegrationintoTraditionalComputingSystems–ReconfigurableComputingSystems–CaseStudies–ReconfigurationManagement.

UNITIII PROGRAMMINGRECONFIGURABLESYSTEMS **9**

ComputeModels-ProgrammingFPGAApplicationsinHDL–CompilingCforSpatialComputing–Operating System Support for Reconfigurable Computing.

UNITIV MAPPINGDESIGNS TORECONFIGURABLEPLATFORMS **9**

The Design Flow -Technology Mapping–FPGA Placement and Routing–ConfigurationBitstreamGeneration–CaseStudieswithAppropriateTools.

UNITV APPLICATIONDEVELOPMENTWITH FPGAS **9**

CaseStudiesofFPGAApplications–SystemonaProgrammableChip(SoPC)Designs.

TOTAL:45PERIODS

REFERENCES:

1. ChristopheBobda,―IntroductiontoReconfigurableComputing– Architectures,AlgorithmsandApplications‖,Springer,2010.
2. Maya B.Gokhale and PaulS. Graham,―Reconfigurable Computing:Accelerating Computation with Field-Programmable GateArrays‖,Springer,2005.
3. FPGAFrontiers:NewApplicationsinReconfigurableComputing,2017,NicoleHemsoth,TimothyPrickettMorgan,NextPlatform**.**
4. Reconfigurable Computing:FromFPGAs toHardware/Software Code sign 2011Editionby JoaoCardoso(Editor),Michael Hübne, Springer
5. ScottHauck andAndreDehon(Eds.), ―ReconfigurableComputingTheTheory andPracticeofFPGA-BasedComputation‖,Elsevier/MorganKaufmann,2008.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	2	2	3	1	-	-
2	-	-	2	3	2	3
3	1	-	1	-	1	3
4	3	1	-	-	3	-
5	1	-	-	2	3	-
Avg	1.75	1.5	2	2	2.25	3

22250E33C - GREEN COMPUTING **L T P C**
4 0 0 4

AIM:

To Understand Green Technology and to implement Green computing practices to efficiently use the computers and its resources.

OBJECTIVES:

- Understanding scientific and social environment.
- Minimizing energy consumption from the IT estate.
- Purchasing green energy and using green suppliers.
- Reducing the paper and other consumables used.
- Minimizing equipment disposal requirements.

UNIT-I **9**

Origins, Regulations and industry initiatives- Government, Industry.

UNIT-II **9**

Approaches to green computing- Product longevity, Algorithmic efficiency.

UNIT-III **9**

Resource allocation, Virtualization.

UNIT-IV **9**

Terminal servers, Power management, Operating system support, Power supply, Storage, Video card, Display.

UNIT-V **9**

Web, Temporal and Spatial Data Mining Materials recycling, Telecommuting, Middleware support for green computing, Tools for monitoring, HPC computing, Green Mobile, embedded computing and networking, Management Frameworks Standards and metrics for computing green

Total: 45hrs

REFERENCES:

1. Green Computing and Green IT Best Practices on Regulations and Industry Initiatives, Virtualization, Power Management, Materials Recycling and Telecommuting by Jason Harris.
2. Green IT: Reduce Your Information System's Environmental Impact While Adding to the Bottom Line.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	2	3	-	1	-
2	1	2	3	-	2	-
3	-	1	3	2	3	2
4	2	-	2	2	1	3
5	3	-	1	2	3	3
Avg	1.75	1.7	2.4	2	2	2.73

22250E34A - SOFTWARE QUALITY ASSURANCE

L	T	P	C
4	0	0	4

AIM:

To develop the ability to analyze and estimate the quality of the software.

OBJECTIVES:

- To introduce an integrated approach to software development incorporating quality management methodologies.
- To study about the quality improvements in software
- To understand the Software Quality software standards

UNIT I **9**

Introduction to software quality - challenges – objectives – quality factors – components of SQA– contract review – development and quality plans – SQA components in project life cycle –SQA defect removal policies – Reviews

UNIT II **9**

Basics of software testing – test generation from requirements – finite state models –combinatorial designs - test selection, minimization and prioritization for regression testing – test adequacy, assessment and enhancement

UNIT III **9**

Testing strategies – white box and black box approach – integration testing – system and acceptance testing – performance testing – regression testing **-** internationalization testing – adhoc testing – website testing – usability testing – accessibility testing Test plan – management – execution and reporting – software test automation – automated testing tools.

UNIT IV **9**

Hierarchical models of software quality – software quality metrics –function points –Software product quality – software maintenance quality – effect of case tools – software quality infrastructure – procedures – certifications – configuration management – documentation control.

UNIT V **9**

Project progress control – costs – quality management standards – project process standards –management and its role in SQA – SQA unit

Total = 45hrs

REFERENCES

1. 1.Daniel Galin, Software quality assurance – from theory to implementation, Pearson education, 2009.
2. Aditya Mathur, Foundations of software testing, Pearson Education, 2008.
3. Srinivasan Desikan and Gopalaswamy Ramesh, Software testing – principles and practices , Pearson education, 2006.
4. Ron Patton, Software Testing , second edition, Pearson education, 2007.

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	3	3	3	3	2	3
2	2	2	2	3	2	3
3	3	1	1	2	1	3
4	2	2	2	3	2	1
5	1	1	1	3	1	2
Avg	2.20	1.80	1.80	2.80	1.60	2.40

22250E34B - BIO-INSPIREDCOMPUTING L P T C

4 0 0 4

OBJECTIVE:

- To Learn bio-inspired the oremand algorithm
- To understand random walk and simulated an nealing.
- To Learn genetic algorithm and differential evolution.
- To Learn swarm optimization and ant colony for feature selection.
- To Understand bio-inspired application in image processing.

UNIT I INTRODUCTION 9

Introduction to algorithm-Newton's method-optimization algorithm-No-Free-Lunch theorem-Nature-Inspired Mataheuistics-Analysis of Algorithm-Nature Inspired Algorithm-Parameter Tuning and parameter control.

UNIT II RANDOMWALK AND ANEALING

Random variable-Isotropic Random walk-Leavy Distribution and flights-Markov chains- step sizes-and search efficiency-Modality and intermittent Search Strategy- important of randomization-Eagle strategy-Annealing and Boltzmann Distribution-Parameter-SAlgorithm-Stochastic Tunneling.

UNIT III GENETICAL ALGORITHM AND DIFFERENTIAL EVOLUTION 9

Introduction to genetic algorithm- and role of genetic operator-choice of parameter-GA varients-Schematheorem-covergence analysis-Introduction to differential evolution-varients-choice of parameters-Convergence analysis-implementation.

UNIT IV SWARMOPTIMIZATION AND FIREFLY ALGORITHM 9

Swarmintelligence-PSOalgorithm-acceleratedPSO-implementation-convergenceanalysis-binaryPSO-TheFireflyalgorithm –algorithm analysis -implementation-varients- Antcolony optimization toward feature selection.

UNIT V APPLICATIONINIMAGEPROCESSING 9

Bio-Inspired Computation and its Applications in Image Processing: An Overview - Fine- Tuning Enhanced ProbabilisticNeuralNetworksUsingMetaheuristicdrivenOptimizationFineTuningDeepBeliefNetworksusingCuckooSearch-ImprovedWeightedThresholded Histogram Equalization AlgorithmforDigitalImageContrast EnhancementUsingBatAlgorithmGroundGlassOpacityNodulesDetectionandSegmentationung SnakeModel -MobileObjectTrackingUsingCuckooSearch

OUTCOMES:

Upon completion of the course, thestudents should be able to

- Implement and apply bio-inspired algorithms
- Explain random walk and simulated annealing
- Implement and apply genetic algorithms
- Explain swarm intelligence and ant colony for feature selection
- Apply bio-inspired techniques in image processing.

REFERENCES

1. Eiben, A.E.,Smith,JamesE,"IntroductiontoEvolutionaryComputing",Springer 2015.
2. HelioJ.C.Barbosa,"AntColonyOptimization-TechniquesandApplications",Intech2013

3. Xin-She Yang, Jaao Paulo papa, "Bio-Inspired Computing and Applications in ImageProcessing",Elsevier2016
4. Xin-SheYang,"NatureIspiredOptimizationAlgorithm,ElsevierFirstEdition2014
   Yang ,Cui,XIao,Gandomi,Karamanoglu ,"Swarm Intelligence .

CO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
1	1	1	-	-	-	3
2	1	1	2	2	1	2
3	1	2	1	1	3	3
4	1	2	2	2	2	2
5	1	2	1	-	2	3
Avg	1.00	1.60	1.50	1.67	2.00	2.60

22250E34C - WIRELESS APPLICATION PROTOCOLS

L	T	P	C
4	0	0	4

AIM:

To introduction the advanced element in the field of wireless communication.

OBJECTIVE:

- Be able to discuss current and emerging technology in Wireless technology.
- Understand fundamental trends of technological evolution of Wireless technology.
- Have hands-on knowledge in developing simple and comprehensive WAP contents.
- Be able to create simple Wireless applicaitions.

UNIT-I: **9**

Wireless Concepts - Technologies - An Overview of WAP - WAP Application Environment - WAP Gateways - WAP Gateway Services and Security.

UNIT-II: **9**

WAP Components - Specification - Standard Execution Environment - Agent Characters - Main Protocols - WTP/WSP/WDP(UDPYWEMP Transportation and WTLS Protocol.

UNIT- III: **9**

WAP Design and Development - The Development Tools - WML Language - WML Script Language.

UNIT-IV: **9**

Implementing an Enterprise WAP Strategy, Wireless transmission- Spread spectrum - MAC - SDMA - FDMA - TDMA - CDMA - Cellular Wireless Networks.

UNIT-V: **9**

Application Area of WAP: Wireless Operator's Interrelated Services -Mailbox Management - Searching the Phone Directory - Managing Personal Information.

Total:45hrs

TEXT BOOKS :

1. Steve Mann & Scott Sbihli, - Wireless Application Protocols - Wiley Computer Publishing - 2000
2. S.Ruseyev - WAP Technology & Applications - Easwar Press - 2003 .

Total:45hrs

TEXT BOOKS :

3. Steve Mann & Scott Sbihli, - Wireless Application Protocols - Wiley Computer Publishing - 2000
4. S.Ruseyev - WAP Technology & Applications - Easwar Press - 2003 .

REFERENCE BOOKS :

1. Sandeep singhal , Jari Alwinen., -The Wireless Application Protocol: Writing Applications for the Mobile Internet - Addison Wesley Publications - 2000 .

CO	POS					
	PO1	PO2	PO3	PO4	PO5	PO6
1	-	-	2	2	3	2
2	3	2	3	-	-	-
3	2	-	-	2	3	3
4	3	3	-	2	3	3
5	2	3	3	2	3	3
avg	2.5	2.7	2.7	2	3	2.75