M.Sc. COMPUTER SCIENCE
CHOICE BASED CREDIT SYSTEM (CBCS)

Syllabus
Regular (2017 – 2018)

DEPARTMENT OF COMPUTER SCIENCE

FACULTY OF ARTS, SCIENCE AND HUMANITIES

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)
Eachanari(Post), Coimbatore – 641 021.
Tamilnadu, India
Phone No. 0422-2980011 - 15 Fax No: 0422-2980022-23
E mail ID: info@karpagam.com
Web: www.kahedu.edu.in

Semester-I

17CSP101 **WEB TECHNOLOGY** **4H – 4C**

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the fundamentals of JavaScript and use different objects
- To know the basics of ASP.NET, its objects and web forms
- To relate SQL Server and ASP.NET through database components
- To develop web application that deals with database and website development.
- To understand XML , Namespace and W3C XML Schema
- To get Familiar with Document Object Model for XML

Course Outcomes(COs)

1. Create a client side scripting web application using forms and Java Script
2. Understand the server side scripting of ASP.NET, its objects and web forms
3. Relate SQL Server and ASP.NET through database components
4. Develop web application that deals with database and website development.
5. Understand XML , Namespace and W3C XML Schema
6. Understand the Document Object Model for XML and JavaScript.

UNIT-I

JavaScript: Introduction to JavaScript – Programming fundamentals – Functions and objects – Navigator object model. Form and form elements – Scripting frames and multiple windows – Event object.

UNIT-II

ASP.NET: **ASP & ASP.NET**: An Overview – Programming ASP.NET with VB.NET: ASP Data types – operators- Request Object- Response Object – Server object - Web forms and ASP.NET: Web forms

.

UNIT-III

ASP.NET: ASP.NET Configuration Scope and State: Configuration – state- application – session object- ASP.NET Objects & Components: Scripting object models- ASP components and controls- ASP.NET and SQL server-Using SQL server using database in ASP.NET applications ActiveX data objects

UNIT-IV

Creating Mark up with XML: Introduction – Parsers and well formed XML Documents – Parsing an XML Document - Characters – Mark up – CDATA Sections – XML Namespaces. Document Type Definition – Parsers Well formed and valid XML documents – Element type declarations – Attribute declarations- Attributes Types. Schemas – Schemas VS DTD's – W3C XML Schema

UNIT-V

Document Object Model: DOM implementations – DOM with JavaScript – Components- Creating nodes – Traversing the DOM. Simple API for XML: DOM vs SAX – SAX based Parsers. XLink XPointer XInclude and XBase

SUGGESTED READINGS

TEXT BOOKS

1. David Flanagan.(2011). Javascript: The Definitive Guide (6th ed.). O'Reilly Media.
2. Danny Goodman. (2000). Javascript Bible(3rd ed.). IDG Books India Pvt Ltd. (Page Nos.: 9-16 24-33 68-89 116-130 151-157 174-198 248-252 323-329 348-356)
3. Dave Mercer. 2010. ASP.NET – Beginner's Guide(2nd ed.). New Delhi: MCGraw Hill
4. Rohit Khurana. (2002). Javascript Professional ed.). (2nd ed.). NewDelhi: A.P.H. Publishing Company**.** (Page Nos.: 1-93 98-170)
5. Deitel & Deitel. (2001). XML How to Program(1st ed.). NewDelhi: Pearson Education. (Page Nos: 110-127 134-159 165-186 192-227 232-258 372-391 297-314 319-347 603-608)

REFERENCES

1. David Flanagan. (2006). Javascript: The Definitive Guide. O'Reilly Media.
2. Nicholas C. Zakas. Inc Ebrary & Ebrary. 2005. Professional JavaScript for Web Developers New Delhi: John Wiley & Sons Inc.
3. Russell Jones A. (2000). Mastering ActiveServerPages 3(1st ed.). New Delhi: BPB Publishing.
4. Thau. (2007). The Book of JavaScript: A Practical Guide to Interactive WebPages.
5. Ann Novarro Chuck White & Linda Burman. (2000). Mastering XML(1st ed.). New Delhi: BPB Publications.
6. Charles Ashbacher. (2000). XML in 24 hours(1st ed.). New Delhi: Techmedia Publication.
7. Manish Jain. (2001). XML Complete (1st ed.). New Delhi: BPB Publications.
8. Steve Holzner. (2000). Inside XML (1st ed.). New Delhi: TechMedia.
9. Matthew MacDonald. (2013). ASP.NET The Complete Reference. New Delhi: McGraw Hill Education.

WEB SITES

1. www.w3schools.com/
2. www.2createawebsite.com
3. www.javascriptkit.com
4. www.learn-javascript-tutorial.com
5. www.webteacher.com/javascript
6. www.asptutorial.info
7. www.aspfree.com
8. www.aspnettutorials.com

Semester-I

17CSP102 CRYPTOGRAPHY AND NETWORK SECURITY 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

This course will provide students with a theoretical knowledge to understand the fundamental principles of access control models and techniques and,

- To understand theory of fundamental cryptography, encryption and decryption algorithms
- To know about various encryption techniques.
- To understand various Block Ciphers, DES and AES algorithms
- To understand the concept of Public key cryptography.
- To study about message authentication and hash functions
- To impart knowledge on web security, electronic mail security, firewalls

Course Outcomes (COs)

On successful completion of the course the student should be able to:

1. Classify the symmetric encryption techniques
2. Illustrate various Public key cryptographic techniques
3. Evaluate the authentication and hash algorithms.
4. Summarize the intrusion detection and its solutions to overcome the attacks.
5. Understand basic concepts of system level security
6. Build secure authentication systems by use of message authentication techniques.

UNIT -I

Introduction – Security Trends - The OSI Security Architecture – Security Attacks – Security Services – Security Mechanisms – A Model for Network Security. Classical Encryption Techniques – Symmetric Cipher Model – Substitution Techniques - Transposition Techniques – Rotor Machines - Steganography.

UNIT -II

Block Ciphers and Data Encryption Standard –Block Cipher Principles – The Data Encryption Standard - The Strength of DES –Advanced Encryption Standard (AES) – Evaluation Criteria for AES – The AES Cipher – Multiple Encryption and Triple DES – Block Cipher Modes of Operation – Stream Ciphers and RC4- modular Arithmetic and Euclidean Algorithm.

UNIT-III

Confidentiality using Symmetric Encryption – Placement of Encryption Function – Traffic Confidentiality – Key Distribution – Public key Cryptography and RSA – Principles of Public Key Cryptosystems – The RSA Algorithm- Basic prime numbers and Discrete Logarithms **-**Key Management – Diffie Hellman Key Exchange.

UNIT-IV

Message Authentication and hash functions – Authentication Functions – Message Authentication Codes (MAC's) Functions – Security of Hash Functions and MAC's

Digital Signatures and Authentication Protocols – Digital Signatures – Digital Signature Standard

UNIT-V

Network Security Applications - Authentication Applications – KERBEROS – X.509 Authentication Service – Public Key Infrastructure – Electronic Mail Security – Pretty Good Privacy – S/MIME – IP Security.

SUGGESTED READINGS

TEXT BOOKS

1. William Stallings. 2006. Cryptography and Network Security Principles and Practices(4th ed.). New Delhi: Pearson Education.
   (Page Nos. : 6-35 62-75 80-135 199-220 289-298 317-340 377-390 400-436 436-457 483-506)
2. Atul Kahate. 2003. Cryptography and Network Security (2nd ed.). Tata McGraw Hill New Delhi.

REFERENCES

1. Ankit Fadia. (19980. Network Security(1st ed.). New Delhi: McMillan Publications.
2. Bruce Schneir. (1998). Applied Cryptography (1st ed.). New Delhi: CRC Press.
3. Charlie Kaufman, Radia Perlman, & Mike Speciner. (2003). Network Security Private Communication in a Public World (2nd ed.). New Delhi: Prentice-Hall of India.
4. Menezes, A. Van Oorschot, & Vanstone, S. (1997). Hand Book of Applied Cryptography (1st ed.). New Delhi: CRC Press. (Free Downloadable)

WEB SITES

1. williamstallings.com/Crypto3e.html
2. u.cs.biu.ac.il/~herzbea/book.html
3. www.flipkart.com/search-books/cryptography+and+network+security +William+ stallings+ebook

Semester-I

17CSP103 DATA MINING AND WAREHOUSING 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To identify the scope and essentiality of Data Warehousing and Mining.
- To analyze data, choose relevant models and algorithms for respective applications.
- To study spatial and web data mining.
- To develop research interest towards advances in data mining.
- To introduce students to the basic concepts and techniques of Data Mining.
- To develop skills of using recent data mining software for solving practical problems.

Course Outcomes (COs)

1. Understand Data Warehouse fundamentals, Data Mining Principles
2. Design data warehouse with dimensional modelling and apply OLAP operations.
3. Identify appropriate data mining algorithms to solve real world problems
4. Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
5. Describe complex data types with respect to spatial and web mining.
6. Benefit the user experiences towards research and innovation integration.

UNIT-I

Introduction: Fundamentals of data mining - Data Mining Functionalities - Classification of Data Mining systems - Major issues in Data Mining.

Data Warehouse and OLAP Technology: An Overview - Data Warehouse - Multidimensional Data Model - Data Warehouse Architecture - Data Warehouse Implementation - From Data Warehousing to Data Mining.

UNIT-II

Data Preprocessing: Needs Preprocessing the Data - Data Cleaning - Data Integration and Transformation - Data Reduction - Discretization and Concept Hierarchy Generation - Online Data Storage.

UNIT-III

Mining Frequent Patterns Associations and Correlations: Basic Concepts - Efficient and Scalable Frequent item set Mining Methods - Mining various kinds of Association rules – From Association Mining to Correlation Analysis - Constraint-Based Association Mining.

UNIT-IV

Classification and Prediction: Issues Regarding Classification and Prediction - Classification by Decision Tree Induction - Rule-based Classification – Prediction - Accuracy and Error Measures - Evaluating the Accuracy of a classifier or Predictor - Ensemble Methods - incrvveases the Accuracy - Model Selection.

UNIT-V

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

Applications and Trends in Data mining: Text Mining - Web Mining - Multimedia Mining-Spatial Mining - Visual data mining.

SUGGESTED READINGS

TEXT BOOK

1. Jiawei Han & Micheline Kamber. (2006). Data Mining – Concepts and Techniques(1st ed.). Mumbai: Morgan Kaufmann Publishers.
   (Page Nos: 1-36 47 -94 105-148 227 -267 289 -306 318- 322 354-372 386-458 600-640)

REFERENCES

1. Michael, J.A. , Berry Gordon, S. & Linoff. (2006). Data mining Techniques (2nd ed.). Wiley Publishing Inc.
2. Arun, K. Pujari. (2001). Data Mining Techniques (1st ed.). New Delhi:University Press
3. Gupta, G..K. (2000). Introduction to Data mining with case studies (1st ed.). New Delhi: Prentice Hall of India.
4. Hillol Kargupta ,Anupam Joshi, Krishnamoorthy Sivakumar ,& Yelena Yesha. (2005). Data Mining Next Generation Challenges and Future Directions(1st ed.). New Delhi: Prentice Hall of India .
5. Inmon, W. H. Building the DataWarehouse (1st ed.). New Delhi: Wiley Dreamtech India.
6. Michael, J.A., Berry Gordon, S., & Linoff. (2000). Mastering Data Mining (1st ed.). New Delhi: John Wiley & Sons Inc.
7. Margaret, H. Dunham. (2000). Data Mining Introductory and advanced topics (1st ed.). New Delhi:Pearson Education.
8. Paulraj Ponnaiah. (2002). Data Warehousing Fundamentals (1st ed.). New Delhi: Wiley Student ed.
9. Ralph Kimball. The Data Warehouse Life cycle Tool kit (1st ed.). New Delhi: Wiley Student ed.
10. Sam Anahory, & Dennis Murray. Data Warehousing in the Real World (1st ed.). Pearson Education Asia.
11. Soman, K.P., Shyam Diwakar, & Ajay,V. (2006). Insight into Data Mining Theory and Practice (1st ed.). New Delhi: Prentice Hall of India.

WEB SITES

1. Thedacs.Com
2. Dwreview.Com
3. Pcai.Com
4. Eruditionhome.Com

Semester-I

17CSP104 **CLOUD COMPUTING** **4H – 4C**

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To Provide a good understanding of the concepts, standards in Cloud computing
- To make the student understand about the cloud service providers and their usage.
- To learn how to secure the data in cloud depending.
- To understand the various service level agreements.
- To understand the cloud using various case studies.
- To portray the recent trends in the field of cloud computing and providing exposures to some open source and commercial clouds.

Course Outcomes (COs)

Upon completion of this course the students will be able to:

1. Portray the recent trends in the field of cloud computing and providing exposures to some open source and commercial clouds.
2. Know the architecture of the cloud and the usage of clouds.
3. Secure their data from the security issues.
4. Make the students to work based on the various service level agreements.
5. Work with the traditional cloud and Microsoft azure, etc.
6. Provide a good understanding of the concepts, standards and protocols in Cloud computing

UNIT-I

Introduction to Cloud Computing -Characteristics of Cloud Computing -Paradigm shift - Benefits of cloud computing - Disadvantages of cloud computing- Role of Open Standards-Cloud Computing Architecture: Cloud computing stack-Public cloud -Private cloud -Hybrid cloud -Community cloud

UNIT –II

Infrastructure as a Service (IaaS) -Platform as a Service (PaaS) -Software as a Service (SaaS) -Identity as a Service (IDaaS) -Compliance as a Service (CaaS)- Cloud storage.

UNIT -III

Virtualization Technologies -Load Balancing and Virtualization -Advanced load balancing -The Google cloud - Hypervisors -Virtual machine types -VMware vSphere - Machine Imaging -Porting Applications -The Simple Cloud API - AppZero Virtual Application Appliance

UNIT-IV

Cloud Information Security Objectives -Confidentiality Integrity and Availability -Cloud Security Services - Relevant Cloud Security Design Principles -Cloud Computing Risk Issues -The CIA Triad

Privacy and Compliance Risks -Threats to Infrastructure Data and Access Control -Cloud Access Control Issues -Database Integrity Issues -Cloud Service Provider Risks Architectural Considerations
General Issues- Trusted Cloud Computing -Identity Management and Access Control

UNIT -V

Case Study on Open Source and Commercial Clouds: Microsoft Azure- Amazon EC2- Google Web services – Open Nebula.

SUGGESTED READINGS

TEXT BOOKS

1. Barrie Sosinsky .(2010). Cloud Computing Bible .New Delhi: Wiley- India
2. Rajkumar Buyya, James Broberg, & Andrzej, M. Goscinski. 2011. New Delhi: Tata Mc-Graw Hill.
3. Ronald, L. Krutz, Russell Dean Vines. (2010). Cloud Security: A Comprehensive Guide to Secure Cloud Computing. New Delhi: Wiley –India

REFERENCES

1. Dr Kumar Saurabh.(2012). Cloud Computing (2nd ed.). New Delhi: Wiley India.
2. Anthony T.Velte Toby J.Velte Robert Elsenpeter. (2010). Cloud Computing Practical Approach (1st ed.). New Delhi:Tata McGraw Hill.
3. Nikos Antonopoulos, Lee Gillam. (2012). Cloud Computing: Principles Systems and Applications . Springer.
4. Giovanni Toraldo. (2012). Open Nebula 3 Cloud Computing.

WEB SITES

1. en.wikipedia.org/wiki/Cloud_computing
2. www.ibm.com/cloud-computing/in/en/
3. www.oracle.com/CloudComputing
4. www.microsoft.com/en-us/cloud/default.aspx

Semester-I

17CSP105A WIRELESS AND MOBILE COMPUTING 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To learn about the concepts and principles of mobile computing;
- To explore both theoretical and practical issues of mobile computing;
- To develop skills of finding solutions and building software for mobile computing applications.
- To identify the use of mobile wireless technologies
- To know the types of mobile wireless technologies that are currently being used
- To understand the working of mobile wireless technologies access to network resources.

Course Outcomes (COs)

1. Grasp the concepts and features of mobile computing technologies and applications
2. Have a good understanding of how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support
3. Identify the important issues of developing mobile computing systems and applications
4. Organize the functionalities and components of mobile computing systems into different layers and apply various techniques for realizing the functionalities;
5. Develop mobile computing applications by analyzing their characteristics and requirements, selecting the appropriate computing models and software architectures, and applying standard programming languages and tools;
6. Organize and manage software built for deployment and demonstration.

UNIT-I

Mobile computing applications and Platforms - Introduction – Strengths and Weakness of Wireless – Applications – Platforms to support Mobile Computing Applications –Wireless Networks – Wireless Architecture Security and Management – Wireless Business

UNIT-II

Mobile Computing Applications - Key Characteristics of Mobile Applications – Messaging for users – Mobile Portals – Special Applications – Mobile agent applications

UNIT-III

Wireless Internet Mobile IP and Wireless Web - Internet and Web – How it works – Mobile IP – WWW for wireless – Mobile Web Services - **Mobile Computing Platforms** - Introduction – Wireless Middleware – Wireless Gateways and Mobile Application Servers – WAP – I-MODE Wireless JAVA MMIT and BREW – Voice communication

UNIT-IV

Wireless LANs - IEEE 802.11 – MANET – HiperLAN2 - **Wireless Personal Area Networks** - IEEE 802.15 – Home Networks – Blue tooth LANs – Sensor Networks - **Cellular Networks** - Principles – First Generation(1G) Cellular – Paging networks – Second Generation(2G) Cellular – Data over Cellular Networks – Third Generation Cellular (3G) Networks – Beyond 3G

UNIT-V

WML: Formatting Output – Variables – Input Operations – WML Script – WML Libraries.

SUGGESTED READINGS

TEXT BOOKS

1. Amjad Umar. (2004). Mobile Computing and Wireless Communication – Applications Networks Platforms Architecture and Security New York: NGE Solutions INC.
   (Page Nos: 1.1- 1.52 2.3 – 2.51 3.2 – 3.37 4.3-4.51 6.16-6.36 7.3-7.33 8.4-8.39)
2. Kris Jamsa. (2001). WML & WML Script. New Delhi: Tata McGraw Hill Publishing.
   (Page Nos: 61-198 225-336)

REFERENCES

1. Ashok, K.Talukder,& Roopa, R. Yavagal. (2008). Mobile Computing New Delhi: Tata Mc-Graw Hill Publishing Company Pvt Ltd.
2. Jack, M. Holtzman, & David, J. Goodman. (1994). Wireless and Mobile Communications. Kluwer Academic Publishers.
3. Mischa Schwartz. (2005). Mobile Wireless Communications. Cambridge University Press.

WEB SITES

1. http://www.networkcomputing.com/netdesign/wireless1.html
2. http://www.homeandlearn.co.uk/bc/beginnerscomputing.html
3. http://compnetworking.about.com/
4. http://www.compinfo.co.uk/computer_books.htm#tele

Semester-I

17CSP105B **SOFTWARE TESTING** **4H – 4C**

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objective:

- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.
- To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.
- To expose the advanced software testing topics, such as object-oriented software testing methods, and component-based software testing issues, challenges, and solutions.
- To gain software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects.
- To gain the techniques and skills on how to use modern software testing tools to support software testing projects

Course Outcomes(COs)

1. Have the ability to understand the fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods
2. Have an ability to design and conduct a software test process for a software testing project.
3. Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
4. Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
5. Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.
6. Have an ability to use software testing methods and modern software testing tools for their testing projects.

UNIT-I

Introduction about testing Definition about software testing-Principles of testing-Phases of software project-Difference between QC and QA-Testing Verification and Validation. Life cycle models for Waterfall Spiral and V model.

UNIT-II

Types of testing-White box testing- Black box testing-Performance testing- Regression testing-Adhoc testing.

UNIT-III

Test planning-Test process-Test reporting-Best practices-Test planning check list-Test plan templates-Test case writing-Techniques for SRS document.

UNIT-IV

Software test automation-Skills needed for automation-What to automate-Scope of automation-Design and architecture for automation. Process model for automation-Selecting test tool.

UNIT-V

Test metrics – Types of metrics – Project metrics-progress metrics-productivity metrics. What is win runner-Methods of testing in win runner.

SUGGESTED READINGS

TEXT BOOK

1. Srinivasan Desikan , GopalaSwamy & Ramesh. (2008). Software testing –Principles and Practices (1st ed.). New Delhi : Pearson Education.
   (Page Nos: 3-22 25-43 47-68 73-104 169-190 193-207 228-248 351-385 388-416 420-456)

REFERENCES

1. Boris Beizer. (2000). Software Testing Techniques (2nd ed.). New Delhi: Wiley Dreamteach India.
2. Elfride Dustin. (2007). Effective software testing (1st ed.). New Delhi: Pearson Education.
3. Louise Tamres. (2002). Introduction to Software Testing (1st ed.). New Delhi: Pearson Education.
4. Ron Patton. (2004). Software Testing (2nd ed.). New Delhi: Pearson Education.
5. William, E. Perry. (2001). Effective methods for Software Testing (2nd ed.). New Delhi: John Wiley & Sons.

WEB SITES

1. en.wikipedia.org/wiki/Software_testing
2. www.onestoptesting.com/ -
3. www.ece.cmu.edu/~koopman/des_s99/sw_testing/
4. http://students.depaul.edu/~slouie/wr_tut.pdf (Unit V)

Semester-I

17CSP105C **SOFT COMPUTING** **4H – 4C**

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the scope and evolution of soft computing
- To learn the various soft computing frame works
- To be familiar with design of various neural networks
- To be exposed to fuzzy sets and fuzzy logic
- To understand fuzzy measures and reasoning
- To learn genetic programming.

Course Outcomes(COs)

1. Understand the scope and evolution of soft computing
2. Learn the various soft computing frame works
3. Be familiar with design of various neural networks
4. Be exposed to fuzzy sets and fuzzy logic
5. Understand fuzzy measures and reasoning
6. Learn genetic programming.

UNIT-I

Introduction : Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence – Neural Networks - Scope and Evolution– Models of Neural Networks – Feed forward Networks – Supervised Learning Neural Networks – Associative memory networks – Unsupervised learning networks – Special Networks.

UNIT-II

Fuzzy Sets and Fuzzy Logic : Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations - Fuzzy Rules Non – interactive fuzzy sets – Fuzzification– Intuition inference Rank ordering – Defuzzification – Max-membership principle centroid method center of sums center of largest area.

UNIT-III

Fuzzy Measures and Reasoning: Fuzzy arithmetic and measures – Fuzzy reasoning – approximate reasoning – categorical qualitative syllogistic dispositional – Fuzzy inference systems – fuzzy decision making – individual multiperson multi objective Bayesian – fuzzy logic control system – architecture model and application.

UNIT-IV

Machine Learning And Genetic Algorithm : Machine Learning Techniques – Machine Learning Using Neural Nets – Genetic Algorithms (GA) – Simple and General GA – Classification of Genetic Algorithm – Messy Adaptive Hybrid Parallel – Holland Classifier System.

UNIT-V

Application and Implementation Soft Computing: Genetic algorithms -. Traveling Salesperson Problem Internet Search Techniques – Fuzzy Controllers – Bayesian Belief networks for Rocket Engine Control – Neural Network Genetic algorithm and Fuzzy logic implementation in C++ and Matlab.

SUGGESTED READINGS

TEXT BOOK

1. Sivanandam , S.N.,& Deepa, S.N. (2007). Principles of Soft Computing (1st ed.). New Delhi: Wiley India Ltd.

REFERENCES

1.Jyh-Shing, Roger Jang, Chuen-Tsai, & Sun Eiji Mizutani. (2003). Neuro-Fuzzy and Soft Computing. New Delhi: Prentice-Hall of India

2. James, A. Freeman & David, M. Skapura. (2003).Neural Networks Algorithms Applications and Programming Techniques. New Delhi: Pearson Education.

3. George, J. Klir, & Bo Yuan. (1995). Fuzzy Sets and Fuzzy Logic-Theory and Applications. New Delhi: Prentice Hall.

4. Amit Konar. (2000). Artificial Intelligence and Soft Computing(1st ed.). New Delhi: CRC Press.

5. Simon Haykin. (1999). Neural Networks: A Comprehensive Foundation(2nd ed.). New Delhi: Prentice Hall.

6. Mitchell Melanie. (1998). An Introduction to Genetic Algorithm. New Delhi: Prentice Hall.

7. David, E. Goldberg. (1997). Genetic Algorithms in Search Optimization and Machine Learning. Addison Wesley.

WEB SITES

1. www.amazon.in/soft+computing
2. www.soft-computing.de/def.html
3. en.wikipedia.org/wiki/Soft_computing
4. endnote.com/downloads/style/applied-soft-computing
5. www.allbookez.com/soft-computing-lecture-notes/

Semester-I

17CSP111 WEB TECHNOLOGY – PRACTICAL 4H – 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the fundamentals of JavaScript and use different objects
- To know the basics of ASP.NET, its objects and web forms
- To relate SQL Server and ASP.NET through database components
- To develop web application that deals with database and website development.
- To understand XML , Namespace and W3C XML Schema
- To get Familiar with Document Object Model for XML

Course Outcomes(COs)

1. Create a client side scripting web application using forms and Java Script
2. Understand the server side scripting of ASP.NET, its objects and web forms
3. Relate SQL Server and ASP.NET through database components
4. Develop web application that deals with database and website development.
5. Understand XML , Namespace and W3C XML Schema
6. Understand the Document Object Model for XML and JavaScript.

List of Programs

1. Using JavaScript change the font color on reloading a webpage.
2. Generate web page that represents clock-every 60 see the page updated with server current time Using JavaScript.
3. Design a form and validate it using JavaScript.
4. Write Database Access program using ASP.NET
5. Program to retrieve Cookies information using ASP.NET
6. Program to count web page hits using ASP.NET
7. Create a menu in XML.
8. Create a demo for XSLT.
9. Display XML information in Tree structure format.

Semester-I

17CSP112 DATA MINING LAB USING MATLAB– PRACTICAL 4H – 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To identify the scope and essentiality of Data Warehousing and Mining.
- To analyze data, choose relevant models and algorithms for respective applications.
- To study spatial and web data mining.
- To develop research interest towards advances in data mining.
- To introduce students to the basic concepts and techniques of Data Mining.
- To develop skills of using recent data mining software for solving practical problems.

Course Outcomes (COs)

1. Understand Data Warehouse fundamentals, Data Mining Principles
2. Design data warehouse with dimensional modelling and apply OLAP operations.
3. Identify appropriate data mining algorithms to solve real world problems
4. Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
5. Describe complex data types with respect to spatial and web mining.
6. Benefit the user experiences towards research and innovation integration.

List of Programs

1. Write a MATLAB program to do all basic matrix operations in MATLAB for a multidimensional array.

2. Write a MATLAB code to compares and contrasts some similarity and distance measures for the following .

(a) Compute the Hamming distance and the Jaccard similarity between the following two binary vectors.

x = 0101010001
y = 0100011000

3. a. Plot the graph of $f(x) = \exp(-2x^2 - 3y^2)$. Choose appropriate intervals for x and y.
b. Plot the graph of f (x) = cos(x) sin(y). Choose appropriate intervals for x and y.

4. The number of children for different patients in a database is given with a vector
c= {31027634-20010156}
. Find the outliers in the set C using standard statistical parameters mean and variance.
a. If the threshold value is changed from ±3 standard deviations to ±2 standard deviations what additional outliers are found?

5. For a given data set X of three-dimensional samples
X=[{120}{314}{215}{016}{243}{442}{521}{777}{000}{333}]
a) find the outliers using the distance-based technique if
i) the threshold distance is 4 and threshold fraction p for non-neighbor samples is 3.
ii) the threshold distance is 6 and threshold fraction p for non-neighbor samples is 2.

6. Given the data set X with three input features and one output feature representing the classification of samples

X:	**I_1**	**I_2**	**I_3**	**O**
	2.5	1.6	5.9	0
	7.2	4.3	2.1	1
	3.4	5.8	1.6	1
	5.6	3.6	6.8	0
	4.8	7.2	3.1	1
	8.1	4.9	8.3	0
	6.3	4.8	2.4	1

Rank the features using a comparison of means and variances

7. A data set for analysis includes only one attribute X:
X={71251859131219712121334513876}
a) What is the mean of the data set X?
b) What is the median?
c) What is the mode and what is the modality of the data set X?
d) Find the standard deviation for X.
e) Give a graphical summarization of the data set X using a boxplot representation.
f) Find outliers in the data set X.

8. Given a data set with two dimensions X and Y.

X	**Y**
1	5
4	2.75
3	3
5	2.5

a) Use a linear-regression method to calculate the parameters α and β where y= α + βx.
b) Estimate the quality of the model obtained in a) Using the correlation coefficient r.

9. The following is the data set X:

X:	**Year**	**A**	**B**
	1996	7	100

1997	5	150
1998	7	120
1999	9	150
2000	5	130
2001	7	150

Create 2D Presentations:

a) Show a bar chart for the variable A
b) Show a histogram for the variable B.
c) Show a line chart for the variable B
d) Show a pie chart for the variable A

10. Create a MATLAB function to count the number of lines in a text file.

11. Create a structure array for student mark details and print a plot for the marks of the students.

12. The test scores for the three students are given in the following table:

	RDBMS	**OracleDBA**	**WebDesigning**	**AI**
Smith	66	91	95	83
Sam	91	88	80	73
John	80	88	80	78

Find the best student using multifactorial evaluation if the weight factors for the subjects are given as the vector W= [0.3 0.2 0.1 0.4]

Semester-II

17CSP201 INTERNETWORKING WITH TCP/IP 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To get an architectural overview of the TCP/IP Protocol Suite
- To understand about subnets using IP classes
- To understand the key features and functions of ARP Protocol.
- To understand how basic routing protocol works.
- To understand about DNS and its applications
- To understand the concepts of Remote Login and VPN

Course Outcomes (COs)

At the completion of the course, students will:

1. Have the ability to analyze and differentiate networking protocols used in TCP/IP protocol suite.
2. Understand the routing IP datagrams and checksum.
3. Exposed to unicast and multicast routing.
4. Learn about host name resolution and the Domain Name System (DNS).
5. Learn about services and operations of DHCP Servers and Domain Name Servers
6. Understand about SMTP and SNMP.

UNIT-I

Introduction: WAN WAN technologies - Protocols and Standards - TCP/IP protocol suite - Internetworking Devices - Classful IP Addressing – Subnetting – Supernetting – Classless Addressing

UNIT-II

ARP & RARP – Proxy ARP – ARP over ATM – ARP and RARP Protocol Format. IP Datagram – Fragmentation – Options – IP Datagram Format – Routing IP Datagrams – Checksum. ICMP – Types of Messages - Message Format – Error Reporting – Query – Checksum.

UNIT-III

Unicast Routing Protocol: Intra Domain and Inter Domain Routing – Distance Vector Routing – RIP – Link State Routing – OSPF – Path Vector Routing – BGP – Multicast Routing – Multicast Routing Protocols. Group Management – IGMP Message – IGMP Operation – Process to Process Communication – UDP Operation – TCP Services - Flow Control.

UNIT-IV

BOOTP - DHCP – Address Discovery and Binding. DNS – Name Space – DNS in Internet – Resolution – Resource Records

UNIT-V

Remote Login - FTP – SMTP – SNMP. IP over ATM Wan – Cells – Routing the Cells – ATMARP – Logical IP Subnets. VPN

SUGGESTED READINGS

TEXT BOOK

1. Behrouz, A. Forouzan. (2009). TCP/IP Protocol Suite (3rd ed.). New Delhi: Tata McGraw Hill Publication.
   (Page Nos: 2-5 6-38 69-74 84-95 102-121 160-188 191-1-201 221-232 238-241 256-279 299-304 386-430 441-444 457-464 471-488 519-542 561-566 575-576 621-632 637-644 680-682)

REFERENCES

1. Andrews, S. Tanenbaum. (2003). Computer Networks (4th ed.). New Delhi:Prentice Hall of India Private Ltd..
2. Buck Graham. (2007). TCP/IP Addressing (2nd ed.). New Delhi: Harcount India Private Limited.
3. Douglas, E. Comer. (2000). Computer Networks and Internets (4th ed.). New Delhi: Pearson Education.
4. William Stallings. (2007). Data and Communication Network(8th ed.). New Delhi: Tata McGraw Hill.

WEB SITES

1. en.wikipedia.org/wiki/Internet_protocol_suite
2. http://docwiki.cisco.com/wiki/Introduction_to_WAN_Technologies
3. www.yale.edu/pclt/COMM/**TCPIP**.HTM
4. www.w3schools.com/**tcpip**/default.asp

Semester-II

17CSP202 **CYBER SECURITY** **4H – 4C**

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To state the basic concepts in information security, including security policies, security models, and security mechanisms.
- To provide an exposure to the spectrum of security activities methods methodologies and procedures with emphasis on practical aspects of Information Security.
- To understand principles of web security.
- To gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.
- To understand key terms and concepts in cyber law, intellectual property and cybercrimes, trademarks and domain theft.
- To provide the learner will be able to examine secure software development practices.

Course Outcomes (COs)

A student who successfully completes this course should at a minimum be able to:

1. State the basic concepts in information security, including security policies, security models, and security mechanisms.
2. Explain concepts related to applied cryptography including the four techniques for crypto-analysis symmetric and asymmetric cryptography, digital signature, message authentication code, hash functions and modes of encryption operations.
3. Explain common vulnerabilities in computer programs including buffer overflow Vulnerabilities time-of-check to time-of-use flaws incomplete mediation.
4. The learner will gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.
5. The learner will understand key terms and concepts in cyber law, intellectual property and cybercrimes, trademarks and domain theft.
6. The learner will be able to examine secure software development practices.

UNIT-I

Introduction to cybercrime: Introduction-Cybercrime: Definition and Information Security-who are cybercriminals? - Classification of cybercrimes. Cybercrime: The legal perspectives- cybercrimes: An Indian Perspective - cybercrime and the Indian ITA2000: Hacking and the Indian law(s) - A Global Perspective on cybercrimes: cybercrime and the Extended Enterprise - cybercrime Era: Survival Mantra for the Netizens - Concluding Remarks and Way Forward to Further Chapters.

UNIT-II

Cyberoffenses: How Criminals Plan Them: Introduction: categories of Cybercrime -How criminals Plan the Attacks: Reconnaissance Passive Attacks Active Attacks Scanning and

Scrutinizing Gathered Information Attack(Gaining and Maintaining the system Access) - social Engineering: Classification of Social Engineering - Cyberstalking: Types of stalkers Cases Reported on Cyberstalking How stalking Works? real-life incident of Cyberstalking -Cybercafe and Cybercrimes - Botnets: The Fuel for cybercrime: Botnet - Attack Vector-Cloud Computing: Why cloud computing? Types of Services Cybercrime and Cloud Computing.

UNIT-III

Cybercrime: Mobile and wireless Devices-Introduction - Proliferation of Mobile and Wireless Devices - Trends in Mobility-Credit Card Frauds in Mobile and Wireless Computing Era: Types and Techniques of Credit Card Frauds - Security challenges Posed by Mobile Devices - Registry Settings for Mobile Devices - Authentication Service security: cryptographic security LDAP Security RAS Security Media Player Control Security Networking API Security - Attacks on Mobile/Cell Phones: Mobile Phone Theft Mobile Viruses Mishing Vishing Smishing Hacking Bluetooth.

UNIT-IV

Mobile Devices: Security Implication for Organizations – Managing Diversity and Proliferation of Hand-Held Devices Unconventional/ Steath Storage Devices Threats through Lost and Stolen Devices Protecting Data on lost devices Educating the Laptop Users - Organizational Measures for Handling Mobile devices - Related Security Issues: Encrypting Organization Databases Including Mobile Devices in Security Strategy - Organizational Security Policies and Measures in mobile Computing Era: Importance of Security polices relating to mobile Computing Devices Operating Guidelines for Implementing Mobile Devices Security Polices Organizational Policies for the Use of Mobile Hand - Held Devices - Laptops: Physical Security Countermeasures.

UNIT-V

Tools and Methods Used in Cybercrime: Introduction - Proxy Servers and Anonymizers - Phishing: How Phishing Works? - Password Cracking: Online Attacks Offline Attacks Strong Weak and Random Passwords Random passwords - Keyloggers and Spywares: Software Keyloggers Hardware Keyloggers AntiKeylogger Spywares - Virus and Worms: Types of Virus - Trojan Horses and Backdoors: backdoor How to protect from Trojan Horses and Backdoors - Steganography: Steganalysis - DoS and DDoS Attacks: DoS AttacksClassification of DoS Attacks Types or Levels of DoS Attacks Tools Used to Launch DoS Attacks DDoS Attacks How to Protect from DoS/DDoS Attacks – SQL Injection: Steps for SQL Injection Attacks How to Prevent SQL Injection Attacks - Buffer Overflow: Types of Buffer Overflow How to Minimize Buffer Overflow - Attacks on Wireless Networks: Traditional Techniques of Attacks on Wireless Networks Thef of Internet Hours and Wi-fi-based Frauds and Misuses How to Secure the Wireless Networks.

SUGGESTED READINGS

TEXT BOOK

Nina Godbole , & Sunit Belapure. (2013). CYBER SECURITY. New Delhi: Wiley India Pvt. Ltd.

REFERENCES

1. Charles ,P. Pfleeger ,& Shari, L. Pfleeger. (2003).
2. Dieter Gollmann . (2006). Computer Security (2nd ed.). John Wiley & Sons.
3. Godbole, N. (2009). Information Systems Security :Metrics Frameworks and Best Practices . New Delhi: Wiley India.
4. Marther, T., Kumaraswamy, S.,& Latif, S. (2009). Cloud Security and Privacy: An Enterprise Perceptive on Risk and Complaince. O'Reilly.

WEB SITES

1. http://www.csc.ncsu.edu/faculty/ning
2. csrc.nist.gov/publications/nistpubs/800-12/handbook.pdf
3. www2.warwick.ac.uk/fac/sci/dcs/teaching/modules/cs134/

Semester-II

17CSP203 ORACLE 10G ADMINISTRATION 4H – 4C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the Oracle database architecture and how its components work and interact with one another.
- To use performance monitoring database security user management and backup/recovery techniques.
- To create an Operational Database
- To Administer users and manage data.
- To Transport data between databases.
- To Configure the network.

Course Outcomes(COs)

On successful completion of the course the student should be able to:

1. Install the Oracle Database.
2. Back up and recover data.
3. Administer users and manage data.
4. Transport data between databases.
5. Configure the network.
6. Create an Operational Database

UNIT-I

Oracle DBA'S**:** oracle DBA's role - DBA job classification - types of databases. Oracle database 10g architecture: database structures - processes - memory structures - database transaction. Creating an oracle databases**:** creating the database - creating the parameter file-creating a new database - using a server parameter file.

UNIT-II

Schema management**:** creating and managing table spaces – indexes - materialized views. Oracle transaction management: oracle transactions - transaction properties - transaction concurrency control - isolation levels - implementing oracle's concurrency control - using undo data to provide read consistency - transaction query - discrete transactions - autonomous transactions - resumable space allocation.

UNIT-III

Loading and transforming data**:** overview of extraction transformation and loading - using external tables to load data - transforming data.Using data pump export and import: introduction - performing exports and imports -monitoring - transportable table spaces.
Managing and monitoring operational databases: types of oracle performance statistics - server generated alerts - automatic workload repository - active session history - undo and MTTR advisors.

UNIT-IV

User management and database security: managing users - the database resource manager - controlling access to data - auditing database usage - authenticating users -enterprise user security - database security do's and dont's.Backing up databases: backing up oracle databases - the recovery manager - backing up control file - oracle back up tool – user managed backups - database corruption detection - enhanced data protection for disaster recovery. Database recovery: types of database failures - oracle recovery processes - performing recovery with RMAN - media recovery scenarios.

UNIT-V

Improving database performance**:** SQL query optimization - approach to oracle performance tuning - optimizing oracle query processing - oracle optimization and oracle cost based optimizer - writing efficient SQL - DBA's role to improve SQL processing - SQL performance tuning tools - explain plan - SQL tuning advisor - simple approach to tuning SQL statement. Performance tuning: Tuning the instance - introduction to instance tuning - automatic performance tuning vs dynamic performance views - tuning oracle memory - evaluating system performance - measuring IO performance - measuring instance performance - simple approach to instance tuning.

SUGGESTED READINGS

TEXT BOOK

Sam, R. Alapati., & John Watson. (2007). Expert Oracle Database 10g Administration(1st ed.). New Delhi: Springer (India) Pvt Ltd.

REFERENCE BOOKS

1. April Wells. (2006). Oracle DB Administration (1st ed.). New Delhi: Dream Tech Press
2. Ivan Bayross. (2006). Oracle 10g DB with HTMLDB (1st ed.). New Delhi: BPB Publications.
3. Jay Bayross. (2006). Oracle 10g Developer Suite (1st ed.). New Delhi: BPB Publications.

Web Sites

download-uk.oracle.com
cse.psu.edu
dba-oracle.com
otn.oracle.com
oracle.com
techonthenet.com/oracle
forums.oracle.com

Semester-II

17CSP204 INTRODUCTION TO SOFTWARE ARCHITECTURE 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To introduce basic concepts and principles about software design and software architecture.
- To understand design issues followed by coverage on design patterns.
- To get an overview of architectural structures and styles.
- to know practical approaches and methods for creating and analyzing software architecture are presented.
- To analyze the interaction between quality attributes and software architecture.
- To gain experiences with examples in design pattern application and case studies in software architecture.

Course Outcomes(COs)

A student who successfully completes this course should at the minimum be able to:

1. Design and motivate software architecture for large scale software systems
2. Recognize major software architectural styles design patterns and frameworks
3. Understand design issues followed by coverage on design patterns.
4. Generate architectural alternatives for a problem and select among them
5. Use well-understood paradigms for designing new systems
6. Identify and assess the quality attributes of a system at the architectural level

UNIT I

Introduction – Software Architecture – Software Design levels – An Engineering Discipline for Software – The status of Software Architecture – Architectural styles – Pipes and filters – Data Abstraction and Object-oriented organization – Event based implicit invocation – Layered systems – Repositories – Interpreters – Process Control – Other Familiar Architecture – Heterogeneous Architectures.

UNIT II

Case studies - Key word is Context – Instrumentation Software – Mobile Robotics – Cruise Control – Three Vignettes in Mixed Style

UNIT III

Shared Information Systems – Database Integration – Integration in Software Development Environments – Integration in the Design of Buildings – Architectural structures for shared Information Systems

UNIT IV

Guidance for User-Interface Architectures – The quantified Design Space – The value of Architectural formalism – Formalizing the Architecture of a specific system – Formalizing an Architectural Style – Formalizing an Architectural Design Space – Towards a Theory of Software Architecture – Z Notation

UNIT V

Requirements for Architecture – Description Languages – First class connectors – Adding Implicit Invocation to Traditional Programming Languages – Tools for Architectural Design – UniCon – Exploiting Style in Architectural Design Environments – Beyond definition/Use: Architectural Interconnection

SUGGESTED READINGS

TEXT BOOKS

1. Mary Shaw., & David Garlan. Software Architecture – Perspectives on an Emerging Discipline. New Delhi: Prentice Hall of India Eastern Economy edition.
2. Taylor Nenad., Medvidovic Eric., Dashofy, V., & Richard, N. (2010). Software Architecture: Foundations Theory and Practice. New Delhi: Wiley India Pvt. Limited.

REFERENCES

Boris Beizer. (1990). Software Testing Techniques (2nd ed.). Van Nostrand Reinhold.

Semester-II

17CSP205A OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To use an object-oriented method for analysis and design
- To analyse information systems in real-world settings and to conduct methods such as interviews and observations
- To have a general understanding of a variety of approaches and perspectives of systems development, and to evaluate other is development methods and techniques
- To know techniques aimed to achieve the objective and expected results of a systems development process
- To know different types of prototyping
- To know how to use UML for notation.

Course Outcomes (COs)

Upon the completion of the course students will be able to :-

1. Understand the concepts and terms used in the object-oriented approach to systems analysis and design
2. Use Unified Modeling Language 2.2
3. Perform object-oriented analysis and design
4. Identify the characteristics of the UML and explain UML is relevant to the process development.
5. Draw class Diagrams, Object Diagram and Interaction Diagram.
6. Construct various UML models (including use case diagrams, class diagrams, interaction diagrams, statechart diagrams, activity diagrams, and implementation diagrams) using the appropriate notation.

UNIT-I

The Object Model: The evolution of the object model – Elements of the object model – Applying object model. **Classes and Objects:** The nature of an object – Relationships among objects.

UNIT-II

Classes and Objects: The nature of the class – Relationship among classes – The Interplay of Classes and Objects – On building quality classes and objects. **Classification:** The Importance of proper classification – Identifying proper classes and objects – Key abstraction mechanism.

UNIT-III

The notation: Elements of the notation – class diagrams –state transition diagrams – object diagrams.

UNIT-IV

The Process: First principles – The micro development process – The macro development process.

UNIT-V

UML Overview: UML History – Goals of UML – UML concept areas – Syntax of Expressions and Diagrams.

Nature and purpose of Models: A Model – Levels of Models – Meaning of Model. UML Walkthrough: UML views – Static views – use case view – interaction views – state machine view – activity view – physical view – model management view- extensibility constructs.

SUGGESTED READINGS

TEXT BOOK

1. Grady Booch. (2007). Object Oriented Analysis and Design (3rd ed.). New Delhi: Addison Wesley.

REFERENCES

1. James Rumbaugh., Ivar Jcobson., & Grady Booch. (2003). The Unified Modeling Language Reference Manual (1st ed.). New Delhi: Addison Wesley.
2. Martin Fowler., Kendall Scott. (2004). UML Distilled (2nd ed.). New Delhi: Pearson Education.

WEB SITES

1. uml-tutorials.trireme.com/
2. http://www.devshed.com/c/a/Practices/Introducing-UMLObjectOriented-Analysis-and-Design/
3. http://community.sparxsystems.com/tutorials/object-oriented-analysis-and-design

Semester-II

17CSP205B **GRID COMPUTING** **4H – 4C**

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To portray the recent trends in the field of Grid computing and creation and management of Internet-based utility computing infrastructure**.**
- To introduce the principles underlying the function of distributed systems and their extension to grid computing.
- To introduce students to the fundamental components of Grid environments, such as authentication, authorization, resource access, and resource discovery.
- To provide a good understanding of the concepts, standards and protocols in Grid computing
- To enable students to be able to justify the applicability, or non-applicability, of Grid technologies for a specific application.
- To perform analysis, design and implementation of ARC grid computing model.

Course Outcomes (COs)

After successful completion of this course, student will be able to

1. Understand and explain the basic concepts of Grid Computing.
2. Explain the principles underlying the function of distributed systems and their extension to grid computing
3. Explain the advantages of using Grid Computing within a given environment.
4. Identify fundamental components of Grid environments, such as authentication, authorization, resource access, and resource discovery.
5. Understand Data management and transfer in Grid environments.
6. Perform analysis, design and implementation of ARC grid computing model.

UNIT- I

Introduction: Cluster to Grid Computing – Cluster Computing Models – Grid Models – Mobile Grid Models – Applications. Parset: System-independent Parallel Programming on Distributed Systems –introduction – Semantics of the Parset Construct – Expressing Parallelism through Parsets – Implementing Parsets on a Loosely Coupled Distributed System

UNIT- II

Anonymous Remote Computing Model: Issues in Parallel Computing on Interconnected Workstations – Existing Distributed Programming Approaches – The ARC Model of Computation – The Two-tired ARC Language Constructs – Implementation. Integrating Task Parallelism with Data Parallelism: A Model for Integrating Task Parallelism into Data Parallel Programming Platforms – Integration of the Model into ARC – Design and Implementation – Applications - Performance Analysis

UNIT- III

Anonymous Remote Computing and Communication Model: Location – Independent Inter-task Communication with DP – DP Model of Iterative Grid Computations – Design and Implementation of Distributed Pipes. Parallel Programming Model on CORBA: Notion of Concurrency – System Support –Implementation and Performance

UNIT- IV

Sneha-Samuham Grid Computing Model: A Parallel Computing Model over Grids – Design and Implementation – Performance studies. Introducing Mobility into Anonymous Remote Computing and Communication Model – Issues in Mobile clusters and Parallel Computing on Mobile Clusters – Moset Overview – Computation Model – Implementation and Performance

UNIT- V

Distributed Simulated Annealing Algorithms for Job Shop Scheduling - Implementation. Parallel Simulated Annealing Algorithms - Simulated Annealing (SA) Technique – Clustering Algorithm for Simulated Annealing (SA) – Combination of Genetic Algorithm and Simulated Annealing (SA) Algorithm - Implementation. Epilogue : DOS Grid: Vision of Mobile Grids - Mobile Grid Monitoring System – Healthcare Application Scenario.

SUGGESTED READINGS

TEXT BOOK

1. Janakiram, D. (2005). Grid Computing – A Research Monograph. New Delhi: TataMcGraw Hill Publishing Company Limited.

REFERENCES

4. Joshy Joseph., & Craig Fellenstein. (2003). Grid Computing. New Delhi: Pearson Education.
5. Prabhu, C.S.R. (2008). Grid and Cluster Computing New Delhi:Prentice Hall of India

WEB SITES

1. http://cseweb.ucsd.edu/classes/sp00/cse225/notes/fran/introweb.html
2. http://www.wisegeek.com/what-is-grid-computing.htm
3. http://www.cs.kent.edu/~farrell/grid06/lectures/index.html

Semester-II

17CSP205C GEOGRAPHICAL INFORMATION SYSTEM 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To have a basic, practical understanding of GIS concepts, techniques and real world applications.
- To analyze the basic components of GIS
- To classify the maps, coordinate systems and projections
- To process spatial and attribute data and prepare thematic maps
- To identify and rectify mapping inaccuracies
- To formulate and solve geospatial problems

Course Outcomes (COs)

After successful completion of this course, student will be able to

1. Understand the basic concepts of geography necessary to efficiently and accurately use GIS technology.
2. Understand basic GIS data concepts.
3. Have an ability to perform basic GIS analysis of concepts.
4. Have demonstrated a practical application of GIS.
5. Have practical experience using basic GIS tools.
6. Have an understanding of GIS and its relationship to mapping software development.

Unit I

What is a Geographical Information Systems (GIS) – Geographically referenced data – GIS operations – Geographic Coordinate systems – Map Projections – Commonly used Map Projections – Projected Coordinate Systems – Working with Coordinate systems in GIS.

Unit II

Georelational Vector Data Model – Georelational data model – Representation of simple features – Topology – Nontopological Vector data – Data models for composite features.

Object based vector data model – Object based data model – The geodatabase data model – Interface – Topology rules – Advantages of Geodatabase model.

Unit III

Raster Data Model – Elements of Raster Data Model - Raster Data Structure – Data Compression – Data Conversion – Integration of Raster and Vector Data.

Data Input – Existing GIS data – Meta Data – Conversion of Existing Data – Creating New Data.

Unit IV

Geometric Transformation – Root Mean Square (RMS) Error – Interpretation of RMS errors Digitized Maps – Re sampling of Pixel Values.

Spatial Data Editing – Location Errors – Spatial Data Accuracy Standards – Topological Errors – Topological Editing – Nontopological Editing – Other Editing operations

Unit V

Data Display and Cryptography – Cartographic Symbolization – Types of Maps – Typography – Map Design – Map Production.

Data Exploration – Attribute and Data Query – Spatial Data Query – Raster Data Query – GIS Applications.

SUGGESTED READINGS

Text Book

1. Kang-tsung Chang. (2006). Introduction to Geographic Information Systems (3rd ed.). New Delhi: Tata McGraw-Hill.

Reference Book

1. Ian Heywood., Sarah Cornelius., Steve Carver.,& Srinivasa Raju. (2006). An introduction to Geographical Information Systems (2nd ed.). New Delhi: Pearson Education.

Semester-II

17CSP211 ROUTER CONFIGURATION – PRACTICAL 4H – 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To get an architectural overview of the TCP/IP Protocol Suite
- To understand about subnets using IP classes
- To understand the key features and functions of ARP Protocol.
- To understand how basic routing protocol works.
- To understand about DNS and its applications
- To understand the concepts of Remote Login and VPN

Course Outcomes (COs)

At the completion of the course, students will:

1. Have the ability to analyze and differentiate networking protocols used in TCP/IP protocol suite.
2. Understand the routing IP datagrams and checksum.
3. Exposed to unicast and multicast routing.
4. Learn about host name resolution and the Domain Name System (DNS).
5. Learn about services and operations of DHCP Servers and Domain Name Servers
6. Understand about SMTP and SNMP.

List of Programs

1. Simple router configuration.
2. Access and utilize the router to set basic parameters.
3. Connect configure and verify operation status of a device interface.
4. Implement static and dynamic addressing services for hosts in a LAN environment.
5. Identify and correct common problems associated with IP addressing and host configurations.
6. Configure verify and troubleshoot RIPv2.
7. Perform and verify routing configuration tasks for a static or default route given.
8. Configure verify and troubleshoot NAT operation on a router.
9. Configure and verify a PPP connection between routers.

Semester-II

17CSP212 ORACLE 10G ADMINISTRATION – PRACTICAL 4H – 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the Oracle database architecture and how its components work and interact with one another.
- To use performance monitoring database security user management and backup/recovery techniques.
- To create an Operational Database
- To Administer users and manage data.
- To Transport data between databases.
- To Configure the network.

Course Outcomes(COs)

On successful completion of the course the student should be able to:

1. Install the Oracle Database.
2. Back up and recover data.
3. Administer users and manage data.
4. Transport data between databases.
5. Configure the network.
6. Create an Operational Database

List of Programs

1. Demo for globalization support.
2. Create database and do the manipulation.
3. Create users and grant the privileges.
4. Create table space.
5. Create different types of tables.
6. Create index and managing index tables.
7. Demo for flashback database and tables.
8. Export and import the tables.
9. Create back up for tables.
10. Re-sequence the rows using CTAS.
11. Change the initializing parameters.

Semester-III

17CSP301	**J2EE**	**4H – 4C**
Instruction Hours / week: L: 4 T: 0 P: 0	**Marks:** Int : **40** Ext : **60**	Total: **100**

Course Objectives

- To Understand the In-depth concepts of JEE
- To Understand the in-depth Life cycle of servlets and JSP.
- To Learn how to communicate with databases using Java.
- To Handle Errors and Exceptions in Web Applications
- To Use NetBeans IDE for creating J2EE Applications
- To impart expertise in Web Application Development using J2EE.

Course Outcomes(COs)

1. Understand the In-depth concepts of JEE
2. Understand the in-depth Life cycle of servlets and JSP.
3. Learn how to communicate with databases using Java.
4. Handle Errors and Exceptions in Web Applications
5. Use NetBeans IDE for creating J2EE Applications
6. Understand J2EE as an architecture and platform for building and deploying web-based, n-tier, transactional, component-based enterprise applications

UNIT-I

J2EE Overview: Beginning of Java – Java Byte code – Advantages of Java –J2EE and J2SE. J2EE Multi Tier Architecture – Distributive Systems – The Tier – Multi Tier Architecture – Client Tier Web Tier Enterprise Java Beans Tier Enterprise Information Systems Tier Implementation.

UNIT-II

J2EE Database Concepts: Data – Database – Database Schema. **JDBC Objects**: Driver Types – Packages – JDBC Process – Database Connection – Statement Objects – Result Set – Meta Data.

UNIT-III

Java Servlets: Benefits – Anatomy – Reading Data from Client –Reading HTTP Request Headers – Sending Data to client – Working with Cookies.

UNIT-IV

Enterprise Java Beans: Deployment Descriptors – Session Java Bean –Entity Java Bean Message Driven Bean.

UNIT-V

JSP: What is Java Server Pages? - Evolution of Dynamic Content Technologies – JSP & Java 2 Enterprise ed.).; **JSP Fundamentals**: Writing your first JSP- Tag conversions-

Running JSP. **Programming JSP Scripts**: Scripting Languages – JSP tags- JSP directives – Scripting elements – Flow of Control – comments;
Java Remote Method Invocation.

SUGGESTED READINGS

TEXT BOOKS

1. Jim Keogh. (2010). The Complete Reference J2EE (1st ed.). New Delhi: Tata McGraw Hill.
   (PAGE NOS. : 3 - 61 23 - 35 98 – 116124 – 151 157 – 159 350 – 369 406 – 443 380 – 395 486-490)
2. Duane, K. Fields., & Mark, A. Kolb. (2000). Web Development with Java Server Pages (1st ed.). Pune: Manning Publications.
   (PAGE NOS. : 2 – 15 46 - 64 65 – 99)

REFERENCES

1. Joseph, J. Bambara et al. (2001). J2EE Unleashed (1st ed.). New Delhi:Tech Media.
2. Paul, J. Perrone., Venkata, S. R. Chaganti., Venkata S. R. Krishna., & Tom Schwenk. (2003). J2EE Developer's Handbook. New Delhi: Sams Publications.
3. Rod Johnson. (2004). J2EE Development without EJB (1st ed.). New Delhi:Wiley Dream Tech.
4. Rod Johnson., & Rod Johnson, P.H. (2004). Expert One-On-One J2ee Design and Development. New Delhi: John Wiley & Sons.

WEB SITES

1. java.sun.com/javaee/
2. java.sun.com/j2ee/1.4/docs/tutorial/doc/
3. www.j2eebrain.com/

Semester-III

17CSP302 OPEN SOURCE TECHNOLOGIES 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the concepts and principles that underlies modern operating systems
- To practice component to relate theoretical principles with operating system implementation.
- To learn about processes and processor management
- To learn about concurrency and synchronization
- To understand memory management schemes, file system and secondary storage management security and protection etc.
- To use different IPC ways in their programs like Message Queues, Semaphores, and Shared Memories.

Course Outcomes(COs)

At the end of the course the student will be in a position to –

1. Use basic fundamental utilities which are required again and again on daily basis to work on a modern operating system.
2. Write useful shell scripts which greatly and effectively enhance the usefulness of computers, from the point of view of programmers and application developers.
3. Understand basics of various OS related concepts, from programmer's point of view, like files, directories, kernel, inodes, APIs, system calls, processes, signals, etc.
4. Develop applications where several processes need to communicate with each other to complete a task.
5. Use different IPC ways in their programs like Message Queues, Semaphores, and Shared Memories.
6. Write programs which employs advanced concepts like multithreading.

UNIT-I

History and Overview Of GNU/Linux And FOSS 3

Definition of FOSS & GNU History of GNU/Linux and the Free Software Movement Advantages of Free Software and GNU/Linux FOSS usage trends and potential—global and Indian.

UNIT-II

System Administration

GNU/Linux OS installation--detect hardware configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands -logging in listing files editing files copying/moving files viewing file contents changing file modes and permissions process management ; User and group management file ownerships and permissions PAM authentication ; Introduction to common system configuration files & log files ;

Configuring networking basics of TCP/IP networking and routing connecting to the Internet (through dialup DSL Ethernet leased line) ; Configuring additional hardware - sound cards displays & display cards network cards modems USB drives CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux -- accessing the Internet playing music editing documents and spreadsheets sending and receiving email copy files from disks and over the network playing games writing CDs ; X Window system configuration and utilities--configure X windows detect display devices ; Installing software from source code as well as using binary packages.

UNIT-III

Server Setup And Configuration

Setting up email servers--using postfix (SMTP services) courier (IMAP & POP3 services) squirrel mail (web mail services) ; Setting up web servers --using apache (HTTP services) php (server-side scripting) perl (CGI support) ; Setting up file services -- using samba (file and authentication services for windows networks) using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services --using squid (http / ftp / https proxy services) ; Setting up printer services -using CUPS (print spooler) foomatic (printer database) ; Setting up a firewall -Using netfilter and iptables.

UNIT-IV

Programming Tools

Using the GNU Compiler Collection --GNU compiler tools ; the C preprocessor (cpp) the C compiler (gcc) and the C++ compiler (g++) assembler (gas) ; Understanding build systems --constructing make files and using make using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools --using cvs to manage source code revisions patch & diff ; Understanding the GNU Libc libraries and linker –linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries) generating statically linked binaries and libraries generating dynamically linked libraries.

Using the GNU debugging tools --gdb to debug programs graphical debuggers like ddd memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practicies and guidelines for GNU/Linux and FOSS ; Introduction to Bash sed & awk scripting.

UNIT-V

Application Programming

Basics of the X Windows server architecture ; Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localisation support.

SUGGESTED READINGS

TEXT BOOK

1.. Venkateshwarlu, N. B. (2005) Introduction to Linux: Installation and Programming. New Delhi: BPS Publishers.

REFERENCES

1. Matt Welsh., Matthias Kalle Dalheimer., Terry Dawson.,& Lar Kaufman. (2002). Running Linux (4th ed.). O'Reilly Publishers.
2. Carla Schroder.(2004). Linux Cookbook(1st ed.). O'Reilly Cookbooks Series.

Web Sites:

1. http://www.oreilly.com/catalog/ open sources/book/toc.html
2. http://dsl.org/cookbook/cookbook_toc.html
3. http://www.tldp.org/guides.html
4. http://www.gnu.org/doc/using.html
5. http://www.networktheory.co.uk/docs/gccintro/
6. http://sources.redhat.com/autobook/
7. http://cvsbook.red-bean.com/
8. http://www.tldp.org/guides.html
9. http://developer.gnome.org/doc/GGAD
10.http://www.python.org/doc/current/tut/tut.html

Semester-III

17CSP303 DIGITAL IMAGE PROCESSING 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To make the students learn the fundamental theories and techniques of digital image processing.
- To study the mathematical transforms necessary for image processing, image manipulation and a preliminary understanding of Computer Vision.
- To make students to understand the image degradation and enhancement.
- To understand the basic relationships between pixels in an image
- To know various segmentation techniques, and object descriptors.
- To implement pattern recognition to enhance an image.

Course Outcomes(COs)

1. Perform image manipulations and analysis in many different fields.
2. Apply knowledge of computing mathematics science and engineering to solve problems in multidisciplinary research.
3. Implement the understanding in sharpening the image.
4. Perform the image segmentation using the compression method.
5. Understand the image to represent in an region.
6. Analyze the basic algorithms used for image processing &image compression with morphological image processing.

UNIT-I

Introduction: Digital image processing – Origins of digital image processing- Examples of fields that use digital image processing-Fundamental steps in digital image processing-Components of an image processing system-Representing digital image.

UNIT-II

Some Basic relationships between Pixels-Basic gray level transformations- Histogram processing - Basic spatial filtering- Smoothing special filtering- Image Degradation/ Restoration process- Noise Models.

UNIT-III

Image Segmentation: Thresholding - Edge Based Segmentation – Region Based Segmentation – Matching. Image Compression: Error Criterion - Lossy Compression - Lossless Compression.

UNIT-IV

Shape Representation and Description: Region Identification - Contour Based Representation And Description – Region Based Shape Representation And Description

UNIT-V

Image Recognition: Introduction – Statistical Pattern Recognition - Neural Net- Syntactic Pattern Recognition - Graph Matching - Clustering

SUGGESTED READINGS

TEXT BOOK

1. Rafael, C. Gonzalez ., & Richard, E. Woods. (2008). Digital Image Processing (3rd ed.). New Delhi:Pearson Education.

REFERENCES

1. Chanda, B., & Dutta Majumder, D. (2000). Digital Image Processing and Analysis (1st ed.). New Delhi: Prentice Hall of India.
2. Milan Sonka., Vaclav Hlavac.,& Roger Boyle. (2004). Image Processing Analysis and Machine Vision (2nd ed.). New Delhi: Vikas Publishing House.
3. Nick Efford. (2000). Digital Image Processing – A Practical introduction using JAVA (1st ed.). New Delhi: Pearson Education Limited.

WEB SITES

http://www.cs.dartmouth.edu/farid/tutorials/fip.pdf
http://www.imageprocessingbasics.com/
http://www.astropix.com/HTML/J_DIGIT/TOC_DIG.HTM

Semester-III

17CSP304 NETWORK ARCHITECTURE AND MANAGEMENT 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the various architecture models and routing strategies of networks.
- To understand the privacy and security needs of a network and formulate a plan.
- To analyze the various case studies of network architecture and management.
- To implement the SNMP protocol in various architectures.
- To use various network management tools and understand their modules.
- To design an architecture with all the network requirements of a client with felp of network management tools.

Course Outcomes(COs)

1. Understand the various architecture models and routing strategies of networks.
2. Understand the privacy and security needs of a network and formulate a plan.
3. Analyze the various case studies of network architecture and management.
4. Implement the SNMP protocol in various architectures.
5. Use various network management tools and understand their modules.
6. Design an architecture with all the network requirements of a client with felp of network management tools.

UNIT-I

Introduction: Objectives - Component architectures – Reference architecture – Architectural models; Addressing and Routing Architecture: Addressing mechanisms – Routing mechanisms – Addressing strategies – Routing strategies – Architectural considerations; Network Management Architecture: Defining Network Management – Network Management Mechanism - Architectural considerations; Performance Architecture; Developing goals – Performance mechanisms – Architectural considerations

UNIT- II

Security And Private Architecture: Developing a security and privacy plan – Security and privacy Administration & Mechanism - Architectural considerations; Selecting Technologies for the Network Design: Goals – Criteria for Technology Evaluation – Guidelines and constraints on Technology Evaluation – Choices for Network Design; Interconnecting Technologies Within The Network Design: Shared medium – Switching – Routing – Hybrid mechanism – Applying Interconnection Mechanism to the Design

UNIT- III

Case history of Networking and Management: Challenges of Information Technology Managers – Goals organization and functions – Network and System Management – Network Management System Platform; SNMP Broadband and TMN Management:

Network Management Standards & Model – Organization Information and Communication Model – ASN.1 – Encoding structure – Macros – Functional model; Organization and Information Model: Managed Networks – The History of Network Management – Internet Organization and standards – SNMP Model – The Organization and Information Model; Communication and Functional Model: The SNMP Communication Model – Functional Model.

UNIT- IV

SNMPv2 Management: Major changes – System architecture – Structure of Management Information – Management Information Base – SNMPv2 protocol – Compatibility; RMON: Remote monitoring – RMON1 – RMON2 – ATM remote monitoring; Broadband Network Management: ATM Networks - Network and Services – ATM Technology – ATM Network Management; Telecommunication Management Network: Operations systems – Conceptual model – Standards – Architecture – TMN Management service architecture – Integrated view of TMN – Implementation issues.

UNIT- V

Network Management Tools and Systems: Network management tools – Network statistics measurement system – Network Management Systems – System Management; Network Management Applications: Configuration Management - Fault Management - Performance Management – Security Management – Accounting Management – Report Management - Policy Based Management – Service Level Management.

SUGGESTED READINGS

TEXT BOOK

1. James, D. Mc Cabe. (2007) . Network Analysis Architecture and Design (3rd ed.). Morgan Kaufmann Publishers.
2. Mani Subramanian. (2000). Network Management Principles and Practice. New Delhi: Pearson Education Asia Pvt. Ltd.

REFERENCES

1. William Stallings. (1999). SNMP SNMPv2 SNMPv3 and RMON 1 and 2 (3rd ed.). New Delhi: Pearson Education Asia Pvt. Ltd.

WEB SITES

1. http://staff.um.edu.mt/csta1//courses/lectures/csm202/os17.html
2. http://www.inf.uni-konstanz.de/dbis/teaching/ss06/os/ch14-wrongNumber.pdf
3. https://www.cs.columbia.edu/~smb/classes/s06-4118/l26.pdf

Semester-III

17CSP305A DISTRIBUTED OPERATING SYSTEM 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the hardware and software concepts of distributed operating systems, various design issues like transparency, flexilibity etc., and communication and synchronization in distributed operating systems.
- To understand scheduling in distributed operating systems, fault tolerance, real-time distributed systems, and designing of distributed file systems.
- To understand the concept of design and implementation in the context of distributed operating systems.
- To Design and Implement Distributed applications using Technologies like RPC, threads.
- To understand How Distributed Shared Memory is managed**.**
- To analyze security issues in network and distributed environments

Course Outcomes(COs)

1. Understand the different Distributed Systems and the challenges involved in Design of the Distributed Systems.
2. Understand how computing power is created and synchronized in Distributed systems
3. Design and Implement Distributed applications using Technologies like RPC, threads.
4. Learn how to store data in Distributed File System.
5. Understand How Distributed Shared Memory is managed**.**
6. Analyze security issues in network and distributed environments

UNIT-I

Fundamentals – message passing – Remote procedure calls : Introduction – the RPC model – transparency of RPC – Implementing RPC mechanism –stub generation – RPC messages – marshaling arguments and results – server management – parameter passing semantics – call semantics.

UNIT- II

Distributed shared memory : Introduction – general architecture of DSM systems – design and implementation of DSM – granularity – structure of shared memory space – replacement strategy – heterogeneous DSM – advantages of DSM.

UNIT- III

Synchronization: Introduction – clock synchronization – event ordering – mutual exclusion. Resource management: Introduction – desirable features of a good global scheduling algorithm – task management approach – load balancing approach – load sharing approach.

UNIT- IV

Distributed file system: Introduction – desirable features of a good distributed file system – file models – file accessing models.

Naming: Introduction – desirable features of a good naming system – fundamental terminologies and concepts.

UNIT- V

Security: Introduction – potential attacks to computer system – cryptography.

SUGGESTED READINGS

TEXT BOOK

1. Pradeep, K. Sinha.(1997). Distributed Operating Systems Concepts and Design (1st ed.). New Delhi: Prentice Hall of India.

REFERENCES

1. Paul, J. Fortier. (1998). Design of Distributed Operating System concepts and Technology (1st ed.). New Delhi: Tata McGraw Hill.
2. Andrew, S. Tanenbaum. (1995). Distributed Operating System. New Delhi: Pearson Education.

WEB SITES

1. http://staff.um.edu.mt/csta1//courses/lectures/csm202/os17.html
2. http://www.inf.uni-konstanz.de/dbis/teaching/ss06/os/ch14-wrongNumber.pdf
3. https://www.cs.columbia.edu/~smb/classes/s06-4118/l26.pdf

Semester-III

17CSP305B WIRELESS APPLICATION PROTOCOL 4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To Expose students to software and hardware capabilities of wireless applications.
- To provide an overview of Wireless Communication networks area and its applications in communication engineering.
- To appreciate the contribution of Wireless Communication networks to overall technological growth.
- To explain the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.
- To enable students to compare and contrast multiple division techniques, mobile communication systems, and existing wireless networks.
- To design a wireless application using WML

Course Outcomes(COs)

1. Understand software and hardware capabilities of wireless applications.
2. Analyze Wireless Communication networks area and its applications in communication engineering.
3. Appreciate the contribution of Wireless Communication networks to overall technological growth.
4. Explain the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.
5. Compare and contrast multiple division techniques, mobile communication systems, and existing wireless networks.
6. Design and Develop a wireless application using WML

UNIT-I

Mobile Data Introduction**:** The Rise of Mobile Data-Key Services for the Mobile Internet- Overview of the WAP-The origins of the WAP- WAP architecture-WAP Internal Structure-Components of the WAP Standards- WAP Gateways-Network Infrastructure Services Supporting WAP Clients-WAP Architecture Design Principles – Relationship with other standards.

UNIT-II

The Wireless Markup Language**:** Overview-The WML Document Model-WML Authoring-URLS Identity Content-Mark Up Basics- WML Basics-Basic Content-Events Tasks and Binding.

UNIT-III

Variables –Other Content you can include-Controls-Miscellaneous Markup- Sending Information-Application Security-Other Data**;** The Meta element- Document Type

Declarations- Errors and browsers Limitations-Content generation- WML Version Negotiation.

UNIT-IV

User Interface Design**:** Making Wireless Applications Easy to Use- Website Design-Computer Terminals Vs Mobile Terminals-Designing a usable WAP site-structured usability method-user interface design guidelines- Design guidelines for selected WML Elements.

UNIT-V

Wireless Telephony Applications**:** Overview of the WTA Architecture- WTA Client Frame Work –WTA Server and Security- Design Considerations- Application Creation Tool Box- Future of WTA Enhancements.

The Mobile Internet Future**:** Better Content- Easier Access-Beyond Browsing – Beyond Cellular- Mobile Data Unleashed.

SUGGESTED READINGS

TEXT BOOK

1. Sandeep Singhal. (2007).The Wireless Application Protocol (1st ed.). New Delhi: Pearson Education.

2. Charles Arehart., & Nirmal Chidambarametal. Professional WAP (1st ed.). New Delhi: Shroff Publishers & Distributers Pvt Ltd.

REFERENCES

1. Dale BulBrook. (2004). WAP –A Beginner's Guide (1st ed.). New Delhi: TMH Publication
2. Ruseyev, S. (2003). WAP Technology &Applications(1st ed.). New Delhi: Eswar Publications.

Web Sites :

www.en.wikipedia.org/wiki/Wireless_Application_Protocol
www.wap.com
www.w3schools.com/wap/

Semester-III

17CSP305C WAN TECHNOLOGIES 4H – 4C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To describe common WAN protocols and interfaces like PPP.
- To demonstrate basic routing and network troubleshooting.
- To understand Frame delay and congestion control mechanisms
- To learn about ISDN and ISDN devices
- To analyze about VPN and its mechanisms
- To understand Asynchronous Transfer Mode (ATM) and VoIP standards and Devices

Course Outcomes(COs)

Upon successful completion of this course, the student will be able to:

1. Describe common WAN protocols and interfaces.
2. Demonstrate basic routing and network troubleshooting.
3. Understand Frame delay and congestion control mechanisms
4. Learn about ISDN and ISDN devices
5. Analyze about VPN and its mechanisms
6. Understand Asynchronous Transfer Mode (ATM) and VoIP standards and Devices

Unit I

Introduction to WAN Technologies: Point To Point Links – Circuit & Packet Switching – Virtual Circuits – Dialup Services – WAN Devices. Dialup Technology: Background – Dialup Connectivity – Dialup Methods – Benefits and Drawbacks.

Unit II

Point-To-Point Protocol: PPP Encapsulation – Link Operation – LCP Packet Formats – LCP Configuration Options. X.25: Devices and Protocol Operation – Protocol Suite – LAPB Frame Format – X.21 Address Format.

Unit III

Frame Relay: Frame Relay Devices – Virtual Circuits – Congestion Control Mechanisms – Local Management Interface – Frame Format. Integrated Services Digital Network: ISDN Devices – ISDN Channels – Services – ISDN Interfaces – ISDN Specification – Signaling System 7. Virtual Private Networks: Background – Layer 2 Tunneling Protocol – Operational Mechanisms – Adding More Security.

Unit IV

Asynchronous Transfer Mode: Standards – ATM Devices and the Network Environment – Cell Header Format – ATM Services – Switching Operations – Reference Model – Addressing – Connections – ATM and Multicasting – Quality of Service – Signaling and

Connection Establishment – Connection Management Messages – PNNI – Integrated Local Management Interface – LAN Emulation – Multiprotocol Over ATM – Physical Layer Architecture. MPLS/Tag Switching: Operations – Switching Architecture – Hierarchical Routing – Multicast Routing – Label Switching With ATM – Quality of Service and Traffic Engineering.

Unit V

Voice/Data Integration Technologies: Introduction – Advances in Applications – Voice Networking – Voice Over ATM – Voice Over Frame Relay – VOIP Standards – VOIP Technology and Future Communications – SGCP – The Simple Control Interface – Gateway Control Interface – Gateway Control Functions – Encoding of the Session Description – SGCP Transmission Over UDP – Security Requirements – Cash Flows – MGCP Overview – General SIP Tutorial. Digital Subscriber Line: ADSL Signaling and Modulation – DSL Technologies.

SUGGESTED READINGS

Text Books

1. Ed Taylor. (2000). Networking Handbook (1st ed.). New Delhi: Tata McGraw Hill (Chapter 56910)
2. CISCO Systems. (2001). Internetworking Technologies Handbook. New Delhi: Techmedia. (Chapter 31012 15171819 21 2728)

Reference Book

1. Behrouz, A. Forouzan. (2003). Data Communication and Networking (3rd ed.). New Delhi: Tata McGraw Hill.

Semester-III

17CSP311 **J2EE – PRACTICAL** **4H – 2C**

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Int : **40** Ext : **60** Total: **100**

Course Objectives

- To Understand the In-depth concepts of JEE
- To Understand the in-depth Life cycle of servlets and JSP.
- To Learn how to communicate with databases using Java.
- To Handle Errors and Exceptions in Web Applications
- To Use NetBeans IDE for creating J2EE Applications
- To impart expertise in Web Application Development using J2EE.

Course Outcomes(COs)

7. Understand the In-depth concepts of JEE
8. Understand the in-depth Life cycle of servlets and JSP.
9. Learn how to communicate with databases using Java.
10. Handle Errors and Exceptions in Web Applications
11. Use NetBeans IDE for creating J2EE Applications
12. Understand J2EE as an architecture and platform for building and deploying web-based, n-tier, transactional, component-based enterprise applications

List of Programs

1. Create a sign in form in servlets.
2. Write a servlet Program to lock a server.
3. Write a servlet program that returns list of information in table format.
4. Design a counter that counts number of times user has visited the site in current browsing session.
5. Write a program to retrieve cookies information
6. Build a JAVA Bean for opening an applet from JAR file.
7. Write a program to add controls in BEAN.
8. Design a counter in JAVA BEAN.
9. Write a program to stream contents of a file using JSP.
10. Write a program to insert an applet into JSP page.

Semester-III

17CSP312 LINUX – PRACTICAL 4H – 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Int : **40** Ext : **60** Total: **100**

Course Objectives

- To understand the concepts and principles that underlies modern operating systems
- To practice component to relate theoretical principles with operating system implementation.
- To learn about processes and processor management
- To learn about concurrency and synchronization
- To understand memory management schemes, file system and secondary storage management security and protection etc.
- To use different IPC ways in their programs like Message Queues, Semaphores, and Shared Memories.

Course Outcomes(COs)

At the end of the course the student will be in a position to –

1. Use basic fundamental utilities which are required again and again on daily basis to work on a modern operating system.
2. Write useful shell scripts which greatly and effectively enhance the usefulness of computers, from the point of view of programmers and application developers.
3. Understand basics of various OS related concepts, from programmer's point of view, like files, directories, kernel, inodes, APIs, system calls, processes, signals, etc.
4. Develop applications where several processes need to communicate with each other to complete a task.
5. Use different IPC ways in their programs like Message Queues, Semaphores, and Shared Memories.
6. Write programs which employs advanced concepts like multithreading.

List of Programs

1. To write a Linux program to display process deadlock state.
2. To write a program to display the allocated memory.
3. To write a program to simulate the DOS Command-Copy.
4. To write a program to implement signal handling.
5. To write a simple Linux program using thread.
6. To write a program to display the date & time using TCP Sockets.
7. To write a program to display the date & time using UDP Sockets.
8. To write a program to display the cpu scheduling
9. To write a Linux program to create a lock file.
10. To write a program to display the user information