PERIYAR UNIVERSITY
PERIYAR PALKALAI NAGAR SALEM 636 011

MASTER OF SCIENCE IN COMPUTER SCIENCE
SEMESTER PATTERN
Under Choice Based Credit System

REGULATIONS AND SYLLABUS
FOR AFFILIATED COLLEGES
(Effective from the Academic year 2021 - 2022 onwards)
PERIYAR UNIVERSITY  
PERIYAR PALKALAI NAGAR SALEM 638 011  
Regulations  
Effective from the Academic year 2021 - 2022

1. OBJECTIVE OF THE COURSE

To Develop the Post Graduate in Computer Science with strong knowledge of theoretical computer science and who can be employed in research and development units of industries and academic institutions.

2. CONDITION FOR ADMISSION

A candidate who has passed in B.Sc Computer Science / B.C.A / B.Sc Computer Technology / B.Sc Information Science / B.Sc Information Technology degree of this University or any of the degree of any other University accepted by the syndicate as equivalent thereto subject to such conditions as may be prescribed therefore shall be permitted to appear and qualify for the M. Sc Computer Science degree examination of this University after a course of study of two academic years.

3. DURATION OF THE COURSE

The programme for the degree of Master of Science in Computer Science shall consist of two Academic years divided into four semesters.

4. EXAMINATIONS

The examination shall be of three hours duration for each course at the end of each semester. The candidate failing in any subject(s) will be permitted to appear in the subsequent examination.

The practical / project should be an individual work. The University examination for practical / project work will be conducted by the internal and external examiners jointly at the end of each semester.
5. STRUCTURE OF M. Sc (Computer Science) PROGRAMME UNDER CBCS PATTERN FOR AFFILIATED COLLEGES

CURRICULUM AND SCHEME OF EXAMINATIONS

<table>
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<tr>
<th>Courses</th>
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ELECTIVES

**Elective Course–I**
- Advanced Computer Architecture
- Optimizing Techniques
- Embedded Systems

**Elective Course–II**
- Soft Computing
- Advanced Database Management System
- Advanced Computer Networks

**Elective Course–III**
- Object Oriented System Development
- Cloud Computing
- Artificial Intelligence

**Elective Course–IV**
- WAP and XML
- Mobile Computing
- Gird Computing

**Elective Course–V**
- Web Services
- Wireless Networks
- Cryptography and Network Security

EDC-EXTRA DISCIPLINARY COURSE
Students are expected to opt EDC (Non major elective) offered to other departments.

1. Principles of Information Technology
2. Fundamentals of Computers and Communications
3. E-Commerce

CIA – CONTINUOUS INTERNAL ASSESSMENT
EA – EXTERNAL ASSESSMENT

6. EXAMINATIONS
   THEORY
   EVALUATION OF CONTINUOUS INTERNAL ASSESSMENT

   | Test            | 10 Marks |
   | Seminar         | 05 Marks |
   | Assignment      | 05 Marks |
   | Attendance      | 05 Marks |

   Total : 25 Marks

(No passing minimum)
EVALUATION OF EXTERNAL ASSESSMENT QUESTION PAPER PATTERN

Time: 3 Hours

Max. Marks: 75

PART- A: $15 \times 1 = 15$ marks
Answer all the questions
Three questions from each unit (Multiple Choice Questions)

PART- B: $2 \times 5 = 10$ marks
Answer any TWO questions
One question from each unit

PART- C: $5 \times 10 = 50$ marks
Answer all the questions
One question from each unit (either or type)

The Passing minimum shall be 50% out of 75 marks (38 marks)

PRACTICAL / SOFTWARE DEVELOPMENT
EVALUATION OF CONTINUOUS INTERNAL ASSESSMENT

Test1 : 15 Marks
Test2 : 15 Marks
Record : 10 Marks
-------------
Total : 40 Marks
-------------

(Record Note must be compulsorily submitted while attending the Practical Examination and No passing minimum)

EVALUATION OF EXTERNAL ASSESSMENT
1) PRACTICAL
QUESTION PAPER PATTERN

Time: 3 Hours
Max. Marks: 60

There will be two questions with or without subsections to be given for the practical examination. Every question should be chosen from the question bank prepared by the examiner(s).

Distribution of Marks
Each question : 30 Marks
Problem Understanding : 05 Marks
Program writing : 10 Marks
Debugging : 10 Marks
For Correct Results : 05 Marks
II) SOFTWARE DEVELOPMENT

Viva-voce (jointly) : 30 Marks Modification : 30 Marks

Students should write about their software development briefly.
  i.  Aim
  ii. Features
  iii. Modules
  iv. Modification

III) PROJECT WORK

Continuous Internal Assessment : 50 Marks Evaluation & Viva-Voce (Jointly) : 150 Marks

7. REGULATIONS FOR THE PROJECT WORK

➢ OPTION – I for IV SEMESTER
  • Students should do their Project work in the Institution along with one Core Course and one Elective Course

➢ OPTION – II for IV SEMESTER
  • Students should do their Project work in Government/Government Aided / Multinational Company

➢ Common instruction for the project work (For both OPTION – I and OPTION – II) of IV SEMESTER
  • The Candidate should submit the filled in format as given in Annexure-I to the department for approval during the 1st Week of December.
  • Periodically the project should be reviewed.
  • The Student should submit three copies of their Project work.
  • A Sample format is enclosed in Annexure-II.
  • Format of the Title page and Certificate are enclosed in Annexure-III.
  • The students may use power point presentation during their viva voce examination.

8. PASSING MINIMUM

The candidate shall be declared to have passed in the Theory / Practical / Project Work examination, if the candidate secures not less than 50% marks in EA and also in total of the prescribed marks. However submission of a record note book is a must.
9. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Candidates who obtain 75% and above in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the programme at the first appearance. Candidates, other than the above, who secure not less than 60% of the aggregate marks in the whole examinations, shall be declared to have passed the examination in **First Class**. The remaining successful candidates shall be declared to have passed in **Second Class**.

Candidates who pass all the examinations prescribed for the programme in first instance and within a period of two academic years from the year of admission are only eligible for **University Ranking**.

10. MAXIMUM DURATION FOR THE COMPLETION OF THE PROGRAMME

The maximum duration to complete the programme shall be three academic years after normal completion of the programme.

11. COMMENCEMENT OF THIS REGULATION

These regulations shall take effect from the academic year 2021-22, that is, for students who are admitted to the first year of the programme during the academic year 2021-22 and thereafter.

12. TRANSITORY PROVISION

Candidates who were admitted to the M.Sc., Computer Science programme of study before 2021-2022 shall be permitted to appear for the examinations under those regulations for a period of three years after completion of the programme. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.
PERIYAR UNIVERSITY

Name of the College : 
Programme : 
Name of the Student : 
Register Number : 
Title of the Project Work : 
Address of Organization / Institution:

Name of the External Guide : 
Designation : 
Place :
Date: Signature of External Guide (With seal)

Name of the Internal Guide : 
Qualification : 
Teaching Experience : 
Place :
Date: Signature of Internal Guide

Principal [Approved or not Approved] [ University Use]
CONTENTS

Chapter                                                                 Page No

COLLEGE BONAFIDE CERTIFICATE                                               1
COMPANY ATTENDANCE CERTIFICATE                                             1
ACKNOWLEDGEMENT                                                           2
SYNOPSIS                                                                  2

1. INTRODUCTION
   ORGANIZATION PROFILE                                                      3
   SYSTEM SPECIFICATION                                                        3
   HARDWARE CONFIGURATION                                                      3
   SOFTWARE SPECIFICATION                                                      3

2. SYSTEM STUDY
   EXISTING SYSTEM
     DESCRIPTION                                                              4
     DRAWBACKS                                                               5
     PROPOSED SYSTEM
     DESCRIPTION                                                             6
     FEATURES                                                                6

3. SYSTEM DESIGN AND DEVELOPMENT
   FILE DESIGN                                                              7
   INPUT DESIGN                                                             8
   OUTPUT DESIGN                                                            10
   CODE DESIGN                                                              10
   DATABASE DESIGN                                                          11
   SYSTEM DEVELOPMENT                                                       11
   DESCRIPTION OF MODULES                                                   11
   (Detailed explanation about the project work)

4. SYSTEM DESIGN AND DEVELOPMENT
   CONCLUSION                                                               12
   BIBLIOGRAPHY                                                             12

APPENDICES
A. DATA FLOW DIAGRAM                                                        13
B. TABLE STRUCTURE                                                          13
C. SAMPLE CODING                                                            13
D. SAMPLE INPUT                                                             14
E. SAMPLE OUTPUT                                                            14
ANNEXURE III

A. Format of the title page

TITLE OF THE PROJECT WORK

A Project Work submitted in partial fulfillment of the requirements for the degree of

Master of Science in Computer Science

To the

Periyar University, Salem - 11

By

NAME OF THE STUDENT

REG. NO.

COLLEGE NAME

(AFFILIATED TO PERIYAR UNIVERSITY)

Place with Pin Code

MONTH – YEAR
B. Format of the Certificate

Name and Address of the Internal Guide

Place

Date

CERTIFICATE

This is to certify that the Project Work entitled ...........................................................
.................................................. submitted in partial fulfillment of the requirements of the degree
of Master of Science in Computer Sciences to the Periyar University, Salem is a record of bonafide
work carried out by .............................. Reg. No. ............. under my supervision and guidance.

Head of the Department

Date of Viva-Voce:

Internal Examiner

External Examiner
SEMESTER I
Core Course-I-DESIGN AND ANALYSIS OF ALGORITHMS

OBJECTIVES:

• To learn effective problem solving in computing applications and analyze the algorithmic procedure to determine the computational complexity of algorithms

UNIT - I


UNIT - II


UNIT - III


UNIT - IV


UNIT - V

Backtracking: The General Method – The 8-Queens Problem – Sum of Subsets– Graph Coloring – Hamiltonian Cycles – Knapsack Problem Branch and Bound: Least Cost search - 0/1 Knapsack Problem.
TEXT BOOK


REFERENCE BOOKS

1. Data Structures Using C - Langsam, Augenstien, Tenenbaum, PHI
2. Data structures and Algorithms, V.Aho, Hopcropft,Ullman,LPE
3. Introduction to design and Analysis of Algorithms - S.E. Goodman, ST. Hedetniem-TMH.

OUTCOMES:

- It gives stepwise procedure to solve problems
- The Problems can be broken down into small pieces for program development
- Efficient approach of solving problems by a model of computations
 SEMESTER I  
Core Course-II - DISTRIBUTED OPERATING SYSTEM

OBJECTIVES:

- To study Distributed operating system concepts
- To understand hardware, software and communication in distributed OS
- To learn the distributed resource management components
- Practices to learn concepts of OS and Program the principles of Operating Systems

UNIT - I


UNIT - II


UNIT - III


UNIT - IV


UNIT - V

TEXT BOOKS


2. Distributed Operating System–Andrew S. Tanenbaum, PHI.

REFERENCES


OUTCOMES:

- Clear understanding on several resource management techniques like distributed shared memory and other resources
- Knowledge on mutual exclusion and Deadlock detection of Distributed operating system.
- Able to design and implement algorithms of distributed shared memory and commit protocols
- Able to design and implement fault tolerant distributed systems.
SEMESTER I
Core Course – III - ADVANCED JAVA PROGRAMMING

OBJECTIVES:

• To deepen student’s programming skills by analyzing the real world problem in a programmer’s point of view and implement the concepts in real time projects

• To enable the students to learn the ethical, historical, environmental and technological aspects of Advanced Java Programming and how it impacts the social and economic development of society

UNIT-I
Design Patterns: Introduction to Design patterns- Catalogue for Design Pattern - Factory Method Pattern, Prototype Pattern, Singleton Pattern- Adapter Pattern- Proxy Pattern-Decorator Pattern- Command Pattern- Template Pattern- Mediator Pattern-Collection Framework – Array List class – Linked List class – Array List vs. Linked List - List Iterator interface - Hash Set class- Linked Hash Set class-Tree Set class Priority Queue class - Map interface - Hash Map class- Linked Hash Map class –Tree Map class - Comparable interface -Comparator interface-Comparable vs.Comparator

UNIT-II

UNIT-III

UNIT-IV
UNIT-V
Lambda Expressions- Method Reference- Functional Interface - Streams API, Filters-Optional Class- Nashorn- Base 64 Encode Decode- JShell (RPEL)- Collection Factory Methods- Private Interface Methods-Inner Class Diamond Operator-Multi resolution Image API.

TEXTBOOKS


REFERENCES


OUTCOMES:

• Able to develop a Graphical User Interface (GUI) with Applet and Swing
• Develop a Client-Server Application with Database Maintenance
SEMESTER I
Core Course-IV-INTERNET OF THINGS

OBJECTIVES:

- In order to gain knowledge on basics of Internet of Things (IoT), IoT Architecture, and the Protocols related to IoT; and understand the concept of the Web of Thing and the relationship between the IoT and WoT

UNIT - I
INTRODUCTION To IoT: Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies – IoT Levels and Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG- IoT Platforms Design Methodology.

UNIT - II
IoT ARCHITECTURE: M2M high-level ETSI architecture - IETF architecture for IoT - OGC architecture - IoT reference model - Domain model - information model - functional model - communication model- IoT reference architecture

UNIT - III

UNIT - IV

UNIT - V
TEXT BOOKS


OUTCOMES:

At the end of this course, students should be able to

• Gain the basic knowledge about IoT and they will be able to use IoT related products in real life

• It helps to rely less on physical resources and started to do their work smarter
SEMESTER I
Core Course-V - Lab – I - ADVANCED JAVA PROGRAMMING LAB

1. Implementation of Multi-threading and Exception handling concepts
2. Write a program to read, write and copy a file using bytestreams.
3. Write a program to read, write and copy a file using character streams.
4. Develop a program using AWT to display the personal detail of an employee.
5. Develop a banking system using Swing.
6. Write a program to handle Mouse and Key events.
7. Implement TCP/IP protocol for message communication.
8. Implement UDP protocol for message communication.
9. Using JDBC develop a student information system.
10. Implement client/server communication using servlets.
11. Develop a web page using JSP.
12. Implementation of RMI.
SEMESTER I
Core Course-VI- 17PCSP02- Lab - II ALGORITHMS USING C++ LAB

1. Apply the Divide and Conquer technique to arrange a set of numbers using Merge Sort method.
2. Perform Strassen’s matrix multiplication using Divide and Conquer method.
6. Solve Dijkstra’s Algorithm using Greedy Technique.
7. Solve Subset Sum problem using Backtracking
8. Implement the 8-Queens Problem using Backtracking.
10. Find the solution of Traveling Salesperson Problem using Branch and Bound technique.
SEMESTER II
Core Course - VII –ADVANCED WEB TECHNOLOGY

OBJECTIVES:

- Explore the backbone of web page creation by developing .NET skill
- Enrich knowledge about HTML control and web control classes
- Provide depth knowledge about ADO.NET
- Understand the need of usability, evaluation methods for web services

UNIT - I

OVERVIEW OF ASP.NET - The .NET framework – Learning the .NET languages Data types – Declaring variables- Scope and Accessibility- Variable operations- Object Based manipulation- Conditional Structures- Loop Structures- Functions and Subroutines. Types, Objects and Namespaces : The Basics about Classes- Value types and Reference types- Advanced class programming- Understanding name spaces and assemblies. Setting up ASP.NET and IIS.

UNIT – II


UNIT – III

UNIT - IV

Web Services - Web services Architecture: Internet programming then and now- WSDL–SOAP- Communicating with a web service-Web service discovery and UDDI. Creating Web services: Web service basics- The Stock Quote web service – Documenting the web service-Testing the web service- Web service Data types- ASP.NET intrinsic objects. Using web services: Consuming a web service- Using the proxy class- An example with Terra Service.

UNIT – V


TEXTBOOK


REFERENCES


OUTCOMES:

On the successful completion of this course, Students will be able to:

- Design a web page with Web form fundamentals and web control classes
- Recognize the importance of validation control, cookies and session
- Apply the knowledge of ASP.NET object, ADO.NET data access and SQL to develop a client server model
- Recognize the difference between Data list and Data grid controls in accessing data
OBJECTIVES:

- Discover principles, algorithms and techniques that can be used to construct various phases of compiler.
- Acquire knowledge about finite automata and regular expressions
- Learn context free grammars, compiler parsing techniques.
- Explore knowledge about Syntax Directed definitions and translation scheme
- Understand intermediate machine representations and actual code generation

UNIT – I


UNIT – II

Syntax Analysis - The role of the parser - Context-free grammars - Writing a grammar - Top down Parsing - Bottom-up Parsing - LR parsers- LALR parsers.

UNIT – III


UNIT– IV


UNIT – V

TEXTBOOK


REFERENCES


OUTCOMES:

On the successful completion of this course, Students will be able to: Use the knowledge of patterns, tokens & regular expressions for solving a problem
SEMESTER II
Core Course - IX–DATA MINING

OBJECTIVES:
- To introduce the fundamental concepts of Data Mining Techniques and various Algorithms used for Information Retrieval from Datasets

UNIT - I

UNIT - II

UNIT - III
Frequent Patterns, Associations And Classification: The Apriori Algorithm – Definition of Classification and Prediction – Classification by Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back Propagation – Lazy Learners – K-Nearest Neighbor–Other Classification Methods.

UNIT - IV

UNIT - V
Spatial, Multimedia, Text And Web Data: Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web – Data Mining Applications – Trends in Data Mining.
TEXT BOOKS


REFERENCES


OUTCOMES:

- After completing this course, students will be familiar with basic data mining concepts for solving real world problems
1. Create minimum two simple applications using controls. Eg: Calculator, Drawing Pictures using GDI, Animation and Trainer Kit.

2. Create a program to perform validation using validation controls.

3. Develop a website using ADO.Net to implement online Banking with login page, account details, deposit, withdraw, fund transfer and report of transaction with following options – last 10 days, last 1 month, last 6 month, last 1 year.
   Note: create menu for navigation and also maintain session that expires after inactive of 5 min.

4. Write a simple ASP.NET program to display the following Web Controls:
   • A button with text “click me”. The button control must be in the center of the form.
   • A label with a text hello
   • A checkbox.
   The form name must be Web Controls.

5. Write an application that simulates sending a SOAP message as a request and receiving another as a response.

6. Develop a web page to insert, update, delete student details using web service for accessing database.

7. Write a simple ASP.NET program using COM component.

8. Write a simple ASP.NET program to check whether a given string is palindrome or not using custom controls.

9. Create a Web Page and add Enable Caching attribute by the concept of Caching in ASP.Net.

10. Write a simple ASP.Net program to perform Form Authentication.
SEMESTER II
Core Course – XI-Lab – IV DATA MINING LAB

Develop R Script for the following:

1. To get the input from user and perform numerical operations (MAX, MIN, AVG, SUM, SQRT, ROUND).
2. To perform data import/export (.CSV, .XLS, .TXT) operations using dataframes.
3. To get the input matrix from user and perform Matrix addition, subtraction, multiplication, inverse transpose and division operations using vector concept.
4. To perform statistical operations (Mean, Median, Mode and Standarddeviation).
5. To perform data pre-processing operations
   i) Handling Missing data   ii) Min-Max normalization
6. To perform dimensionality reduction operation using PCA.
7. To perform Simple Linear Regression and Multi Linear Regression.
8. To perform K-Means clustering operation and visualize it.
9. Write R script to diagnose any disease using KNN classification.
10. To perform market basket analysis using Apriori algorithm.
OBJECTIVES:

- To understand the basic Concepts of Python

UNIT - I


UNIT - II


UNIT-III


UNIT-IV


UNIT-V

TEXT BOOK

REFERENCE

OUTCOMES:
- After completing this course, students will be familiar with the basics of Python programming for writing programs for the real world problems
OBJECTIVES:

- To provide complete knowledge on Digital Image Processing methods, such as image processing methods in Spatial domain and Frequency domain, Edge detection, Compression, Segmentation, and Morphological concepts, which enable the students to understand the concepts and implement them empirically.

UNIT–I

**Fundamentals:** Image Sensing and Acquisition, Image Sampling and Quantization, relationship between Pixels; Random noise; Gaussian Markov Random Field, $\sigma$-field, Linear and Non-linear Operations; Image processing models: Causal, Semi-causal, Non-causal models.


UNIT–II

Spatial Domain: Enhancement in spatial domain: Point processing; Mask processing; Smoothing Spatial Filters; Sharpening Spatial Filters; Combining Spatial Enhancement Methods.

Frequency Domain: Image transforms: FFT, DCT, Karhunen-Loeve transform, Hotlling’s $T_2$ transform, Wavelet transforms and their properties - Image filtering in frequency domain.

UNIT–III

**Edge Detection:** Types of edges; threshold; zero-crossing; Gradient operators: Roberts, Prewitt, and Sobel operators; residual analysis based technique; Canny edge detection. Edge features and their applications.

UNIT–IV

**Image Compression:** Fundamentals, Image Compression Models, Elements of Information Theory. Error Free Compression: Huff-man coding; Arithmetic coding; Wavelet transform based coding; Lossy Compression: FFT; DCT; KLT; DPCM; MRFM based compression; Wavelet transform based; Image Compression standards.
UNIT–V

**Image Segmentation:** Detection and Discontinuities: Edge Linking and Boundary Deduction; Threshold; Region-Based Segmentation. Segmentation by Morphological watersheds. The use of motion in segmentation, Image Segmentation based on Color.

Morphological Image Processing: Erosion and Dilation, Opening and Closing, Hit-Or-Miss Transformation, Basic Morphological Algorithms, Gray-Scale Morphology.

**TEXT BOOKS**


**REFERENCES**


**OUTCOMES:**

At the end of this course, students should able to

- Review the fundamental concepts of a digital image processing system and Analyze images in the frequency domain using various transforms
- Evaluate the techniques for image enhancement and image restoration. Categorize various compression techniques
- Interpret Image compression standards, and Interpret image segmentation and representation techniques
- Gain idea to process various image used in various fields such as weather forecasting, Diagnosis of various disease using image such as tumor, cancer etc
SEMESTER III
Core Course- XIV –BIG DATA ANALYTICS

OBJECTIVES:

- The course provides grounding in basic and advanced methods to big data technology and tools, including Map Reduce and Hadoop and its ecosystem

UNIT - I


UNIT - II


UNIT - III


UNIT - IV

UNIT - V


TEXT BOOK

1. Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data”, EMC Education Services Published by John Wiley & Sons, Inc.2015

REFERENCE


OUTCOMES:

On successful completion of the course the student should

• Able to apply Hadoop ecosystem components
• Able to participate data science and big data analytics projects
SEMESTER III
Core Course – XV - Lab – IV DIGITAL IMAGE PROCESSING LAB

1. Choose two grayscale images or RGB images that you will first have to grayscale (with rgb2gray() function). Display original images and the same images after their QUANTIZATION with different number of bits (1 to 8) using MATLAB.

2. Perform Histogram Equalization on a Color image using MATLAB.

3. Using Spatial Domain technique, write a program in MATLAB to perform Smoothening operation in an image.


5. Find the Boundaries of Objects within an image by Sobel operator method in MATLAB.

6. Write a MATLAB program to detect the edges within the image and compare the results of both Canny and Prewitt Methods.

7. Write a program to Compress an image using Huffman coding method in MATLAB.

8. Implement Discrete Cosine Transformation method to compress an image using MATLAB.

9. Write a MATLAB code for Image Segmentation to convert to a binary image to improve the legibility of text Using thresholding technique.

10. Compute the Watershed Transform of the Segmentation function in an image at foreground and background marker pixels using Marker-Controlled Watershed Segmentation in MATLAB.
SEMESTER III

Core Course – XVI - Lab – IV MINI PROJECT USING OPEN SOURCE

The student must submit a report to the Guide allotted to them and appear for viva-voce examination. The project report may contain the following:

1. Introduction

2. Data Collection / system study

3. System development

4. Implementation
   • Source code
   • Sample input
   • Sample output

5. Conclusion
SEMESTER IV
Core Course- XVII – MACHINE LEARNING

OBJECTIVES:

• To Learn about Machine Intelligence and Machine Learning applications

• To implement and apply machine learning algorithms to real-world applications.

• To identify and apply the appropriate machine learning technique to classification, pattern recognition, optimization and decision problems.

• To understand how to perform evaluation of learning algorithms and model selection.

UNIT - I

UNIT - II

UNIT - III

UNIT - IV
UNIT - V

TEXT BOOKS

REFERENCES

OUTCOMES:
On completion of the course students will be expected to:
- Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc
- Have an understanding of the strengths and weaknesses of many popular machine learning approaches
- Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning
- Be able to design and implement various machine learning algorithms in a range of real-world applications
OBJECTIVES:

- To study parallel computer architecture, design and micro-operations
- To understand the interconnection networks and synchronization mechanism

UNIT-I

UNIT – II

UNIT- III

UNIT – IV

UNIT – V
TEXT BOOKS

REFERENCES

OUTCOMES:
On completion of the course the student can understand

- Parallel computer architecture, design and micro-operations
- Interconnection of networks and synchronization mechanism
- Develop design skills of Instruction Sets
- Know how to design a pipelined data path
ELECTIVE I
OPTIMIZATION TECHNIQUES

OBJECTIVES:

- To understand the concept of optimization
- To develop mathematical model of real life cases
- To study Optimization algorithms

UNIT – I
Linear Programming Problem (LPP): Formulations and graphical solution of (2 variables) canonical and standard terms of linear programming problem. Simplex method, two phase simplex method

UNIT – II
Duality in LPP- dual problem to primal- primalto dual problem- duality simplex method- Revised simplex method-revised simplex algorithm-revised simplex method versus simplex method

UNIT – III

UNIT – IV
Replacement Problem: Replacement policy for equipment that deteriorate gradually, Replacement of item that fail suddenly- Individual and group replacement, Problems in mortality and staffing.

UNIT – V
TEXT BOOKS


REFERENCES


OUTCOMES:

Upon completion of the course, students will have:

- Describe clearly a problem, identify its parts and analyze the individual functions. Feasibility study for solving an optimization problem
- Evaluate and measure the performance of an algorithm, Discovery, study and solve optimization problems
- Understand optimization techniques using algorithms, and Investigate, study, develop, organize and promote innovative solutions for various applications
ELECTIVE I
EMBEDDED SYSTEMS

OBJECTIVES:
This course will enable students to:

- Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system
- Describe the hardware software co-design and firmware design approaches
- Know the RTOS internals, multitasking, task scheduling, task communication and synchronization
- Learn the development life cycle of embedded system

UNIT - I
Introduction to Embedded system - Embedded system vs. General computing systems - History - Classification - Major Application Areas Purpose of Embedded systems - Smart running shoes: The innovative bonding of lifestyle with embedded technology. Characteristics and Quality Attributes of Embedded systems

UNIT - II

UNIT - III

UNIT - IV
RTOS based Embedded System Design: Operating System Basics -Types of operating Systems - Tasks, process and Threads - Multiprocessing and Multitasking - Task Scheduling - Task Communication - Task Synchronization - Device Drivers - choosing an RTOS.

UNIT - V
TEXT BOOK


REFERENCES


OUTCOMES:

Students are able to

- Describe the differences between the general computing system and the embedded system, also recognize the classification of embedded systems
- Become aware of interrupts, hyper threading and software optimization
- Design real time embedded systems using the concepts of RTOS
ELECTIVE II
ADVANCED DATABASE MANAGEMENT SYSTEMS

OBJECTIVES:

- Acquire Knowledge of Database Models, Applications of Database Models and Emerging Trends

UNIT-I

UNIT-II
Distributed and Object based Databases: Architecture, Distributed data storage, Distributed transactions, Commit protocols, Concurrency control, Query Processing. Complex Data Types, Structured Types and Inheritance, Table Inheritance, array and Multi-set, Object Identity and Reference Types, Object Oriented versus Object Relational.

UNIT-III

UNIT-IV

UNIT-V
TEXT BOOK


REFERENCES


OUTCOMES:

On completion of the course, students will able to

• Know about the Various Data models and Works on Database Architecture
• Knowledge patterns, Object Oriented Databases are well equipped
ELECTIVE II
SOFT COMPUTING

OBJECTIVES:

- Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory
- Introduce students to artificial neural networks and fuzzy theory from an engineering perspective

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
TEXT BOOK


REFERENCE


OUTCOMES:

Upon completion of the course, the student are expected to

• Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory

• Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic

• To understand the fundamental theory and concepts of neural networks, identify different neural network architectures, algorithms, applications and their limitations

• Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications

• Reveal different applications of these models to solve engineering and other problems
ELECTIVE II
ADVANCED COMPUTER NETWORKS

OBJECTIVES:

- To study communication network protocols, different communication layer structure
- To learn security mechanism for data communication

UNIT - I

UNIT - II

UNIT - III

UNIT - IV
Network layer - design issues - Routing algorithms - Congestion control algorithms – Quality of Service – Network layer of Internet- IP protocol – IP Address – Internet Control Protocol.

UNIT - V
TEXT BOOK


REFERENCES

2) F. Halsall, 1995, Data Communications, Computer Networks and Open Systems, Addison Wessley.

WEBSITE, E-LEARNING RESOURCES

1)  http://peasonhighered.com/tanenbaum

OUTCOMES:

After the completion of this course students will be able to

- To master the terminology and concepts of the OSI reference model and the TCP-IP reference model
- To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks
- To be familiar with wireless networking concepts, and be familiar with contemporary issues in networking technologies
- To be familiar with network tools and network programming
ELECTIVE III
CLOUD COMPUTING

OBJECTIVES:

- To provide students with the comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture and applications by introducing and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations

- To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research

UNIT - I


UNIT - II


UNIT – III


UNIT-IV

UNIT – V


TEXT BOOKS


REFERENCES


OUTCOMES:

Completing this course provides

- a good understanding of cloud computing and a systematic knowledge of the fundamental technologies, architecture, and security
ELECTIVE III
ARTIFICIAL INTELLIGENCE

OBJECTIVES:

- To understand about the basic theory of problem solving paradigms and search strategies in artificial intelligence
- To make the students familiar with knowledge representation, planning, learning, natural language processing and robotics

UNIT – I

Introduction - Intelligent Agents- Problem Solving - by Searching - Informed Search Strategies-Optimization Problems - Adversarial Search

UNIT – II

Knowledge and Reasoning - Logical Agents - First-Order Logic - Inference in First-Order Logic - Knowledge Representation

UNIT – III


UNIT – IV

Learning - Learning from Examples - Knowledge in Learning - Statistical Learning Methods - Reinforcement Learning

UNIT – V

Communicating, Perceiving and Acting - Natural Language Processing – Communication - Perception – Robotics.
TEXT BOOK


REFERENCES


OUTCOMES:

After completing this course the student will be able to

- Understand the computation intelligence

- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
ELECTIVE III
OBJECT ORIENTED SYSTEM DEVELOPMENT

OBJECTIVES:

- Introduce the concept of Object-oriented design and understand the fundamentals of OOSD life cycle
- Familiar with evolution of object-oriented model, classes and its notations
- Practice UML in order to express the design of software projects
- Specify, analyze and design the use case driven requirements for a particular system
- Enrich knowledge about DBMS, designing classes and object oriented testing

UNIT - I


UNIT – II


UNIT – III


UNIT – IV

Designing view layer classes – Macro level process – Micro level process – The purpose of view layer interface – Prototyping the user interface.

UNIT – V


TEXT BOOK


REFERENCES


OUTCOMES:

On the successful completion of this course, Students will be able to

- Show how the object-oriented approach differs from the traditional approach to systems analysis and design
- Analyze, design, document the requirements through usecase driven approach
- Explain the importance of modeling and how the Unified Modeling Language (UML) represents an object-oriented system using a number of modeling views
- Recognize the difference between various object relationships
ELECTIVE IV
WAP AND XML

OBJECTIVES:

- The purpose of the course is to impart knowledge on extensible Markup Language (XML) and to achieve secured, messaging through webservices

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
TEXT BOOKS


2) Eliotte Rusty Harlod “XML TM Bible”, Books India (P) Ltd, 2000 (For Unit - IV &V)

REFERENCES


OUTCOMES:

Students who successfully complete this course will be able to

- Apply XML concepts to develop Web application
- Develop SOA application using XML and Web Services
- Extract information from the websites using XML programming
ELECTIVE IV
MOBILE COMPUTING

OBJECTIVES:

- Understand the basic concepts of mobile
- Be familiar with GPRS Technology
- System be exposed to Ad-Hoc networks
- Gain knowledge about different mobile platforms and application development

UNIT - I

Basics of mobile - Mobile device profiles - Middleware and gateways - Wireless Internet - Smart clients - Three-tier Architecture- Design considerations for mobile computing—Mobility and Location based services.

UNIT - II

Mobile computing through Internet - Mobile-enabled Applications - Developing Mobile GUIs – VUIs and Mobile Applications – Characteristics and benefits – Multi channel and Multi modal user interfaces – Synchronization and replication of Mobile Data - SMS architecture – GPRS – Mobile Computing through Telephony.

UNIT - III


UNIT - IV


Unit - V

TEXT BOOKS

REFERENCES

OUTCOMES:
• Able to explain the basics of mobile system
• Able to develop mobile application
• Understand the Mobile Adhoc networks and its routing
• Understand the different types of security features
ELECTIVE IV
GRID COMPUTING

OBJECTIVES:

- Understanding the fundamentals of grid computing
- Familiar with grid monitoring
- Learning the concepts of grid security and resources
- Be familiar with grid portals

UNIT-I

UNIT-II

UNIT-III

UNIT-IV

UNIT-V
Trust models for Grid security environment – Authentication and Authorization methods – Grid security infrastructure – Cloud Infrastructure security: network, host and application level – aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.
TEXT BOOK:

OUTCOMES:
On completion of this course you should be able to:

• have knowledge on grid computing, web services and service-oriented architecture, architecture for grid computing and grid scheduling
• explain about the grid security and privacy issues in the cloud
ELECTIVE V
WEB SERVICES

OBJECTIVES:

- To enable the student to be familiar with distributed services, XML and web services
- To study the use of web services in B2C and B2B applications

UNIT – I
Overview of Distributed Computing: Introduction to web services – Industry standards, Technologies and concepts underlying web services – their support to web services. Applications that consume web services.

UNIT – II
XML – its choice for web services – network protocols to back end databases- technologies – SOAP, WSDL – exchange of information between applications in distributed environment – locating remote web services – its access and usage. UDDI specification – an introduction.

UNIT - III
A brief outline of web services – conversation – static and interactive aspects of system interface and its implementation, work flow – orchestration and refinement, transactions, security issues – the common attacks – security attacks facilitated within webservice quality of services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless services – energy consumption, network bandwidth utilization, portals and services management.

UNIT – IV
Building real world enterprise applications using web services – sample source codes to develop web services – steps necessary to build and deploy web services and client applications to meet customer s requirement – Easier development, customization, maintenance, transactional requirements, seamless porting to multiple devices and platforms.

UNIT - V
Deployment of Web services and applications onto Tomcat application server and axis SOAP server (both are free wares) – Web services platform as a set of enabling technologies for XML based distributed computing.
TEXTBOOKS


REFERENCES


OUTCOMES:

On completion of this course you should be able to:

- Understand the design principles and application of SOAP and REST based web services
- Design collaborating web services according to a specification
- Implement an application that uses multiple web services in a realistic business scenario
- Use industry standard open source tools such as Apache Axis2, Tomcat, Derby and Eclipse to build, test, deploy and execute web services and web applications that consume them
ELECTIVE V
WIRELESS NETWORKS

OBJECTIVES:

- To Study about Wireless Networks, Protocol Stack and Standards
- To Study about Fundamentals of 3G Services, its Protocols and Applications
- To Study about Evolution of 4G Networks, its Architecture and Applications

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
TEXT BOOKS


REFERENCES


OUTCOMES:

Upon Completion of the course, the Students will be able to

- Conversant With the Latest 3G/4G and WiMAX Networks and its Architecture
- Design and Implement Wireless Network Environment for any application using Latest Wireless Protocols and Standards
- Implement different type of Applications for Smart Phones and Mobile Devices with Latest Network Strategies
ELECTIVE V
CRYPTOGRAPHY AND NETWORK SECURITY

OBJECTIVES:

- To understand Cryptography Theories, Algorithms and Systems
- To understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks
- To know about the malicious software & firewalls

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
TEXT BOOKS


REFERENCES


OUTCOMES:

At the end of the course, the student should be able to:

- Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
- Apply the different cryptographic operations of symmetric cryptographic algorithms
- Apply the different cryptographic operations of public key cryptography
- Apply the various Authentication schemes to simulate different applications.
- Understand various Security practices and System security standards
EXTRA DISCIPLINARY PAPERS

COMPUTER SCIENCE

List of Extra Disciplinary Courses (Non-Major Electives) offered by the Department of Computer Science/Applications for other PG programmes

EDC – I - PRINCIPLES OF INFORMATION TECHNOLOGY

OBJECTIVES:

- To learn the basic concept and skills associated with information technology
- To know the Computer hardware and software technologies
- To gain the knowledge of organizing data
- To assess the current role of Information Science in an organization
- To understand how IT relates to organizational goals

UNIT-I

Business Environment: Business and Information technology – business in the information age– about information technology–what is an information system– Information Technology in the Modern Organization.

UNIT-II


UNIT-III


UNIT-IV

Functional, Enterprises, and Inter organizational Systems: Information system to support business functions – transaction processing information systems – accounting and finance system – marketing and sales system – production and operations management system –Integrated information system and enterprises resource planning–inter organizational/Global information system. –Electronic Commerce
UNIT-V

TEXTBOOK

REFERENCE BOOK

OUTCOMES:
- Able to understand the basics of information technology
- Gaining the knowledge of Hardware and Software technologies
- Learning the method of organizing data
- Assessing the role of Information Science to an organization.
- Understanding the role of IT in organizations
EDC - II - FUNDAMENTALS OF COMPUTERS AND COMMUNICATIONS

OBJECTIVES:

- To know the basics of Computers
- To learn the internal Components of Computers
- To understand the OS and its types
- To study the basics of networks and Internet
- To get a clear idea on DBMS and its concepts

UNIT-I

UNIT–II

UNIT-III

UNIT-IV

UNIT-V
TEXT BOOK

REFERENCE BOOKS

OUTCOMES:
- Understanding the basics and internal parts of Computers
- Gaining the knowledge on OS and its types
- Studying the basics of networks and Internet
- Learning the databases and DBMS concepts
EDC - III – E – COMMERCE

OBJECTIVES:

• To know the mercantile and consumer process model
• To understand the Consumer’s and Merchant's perspective
• To get an in depth idea on electronic data interchange
• To gain the knowledge on Internet, growth of internet and its commercial uses

UNIT-I

UNIT-II

UNIT-III

UNIT-IV

UNIT-V
Internet and World Wide Web: origin of the Internet – New uses for the Internet – Commercial use of the Internet–Growth of the Internet – Advertising on the Internet.
TEXT BOOKS


REFERENCE BOOKS


COURSE OUTCOMES:

- Learning the introduction on e-commerce
- Understanding the mercantile and consumer process models
- Analysing the consumers and merchant's perspective on e-commerce
- Getting an idea on Electronic Data Interchange
- Gaining the knowledge on Internet