

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

RESEARCH LAB

Equipment's Available in the Lab

Sl.No	Hardware	Specification	Quantity
1	Desktops	HCL Desktop Intel i3 550@3.20GHz Processor, Intel H55 Chipset Motherboard 4GB DDR3 RAM 320 GB SATA HDD 18.5" LED Monitor HCL Keyboard and Optical Mouse	60 Nos
Software			
1	Cisco Packet Tracer		
2	Android Studio Latest Version		
3	1. Open stack 2. Hadoop Eucalyptus or Open Nebula, Virtual Box, VMWare Worksations, Google App Engine SDK, CloudSim Jupyter Notebook,Google Colab		
4	Python 3.9 or later Anaconda distribution Scipy,statmodels,seaborn,plotly		
5	Dream Weaver MySQL Apache Server XAMPP		

COURSES OFFERED

Sl.No	Odd Sem (Course code & Name)	Class	Even Sem (Course code & Name)	Class
1	CS8581 Networks Laboratory	III CSE III IT	CS8662 Mobile Application Development Laboratory	III CSE III IT
2	CS8711 cloud computing laboratory	IV CSE	CS3491 Artificial Intelligence and Machine Learning	II CSE II IT
3	IT8711 FOSS and Cloud Computing Lab	IV IT	CCS335 Cloud Computing	III CSE
4	CS3361 Data Science Laboratory	II CSE II IT	CS3691 Embedded Systems and IOT	III CSE
5	CS3591 Computer Networks	III CSE	CCS370 UI andUX Design	III CSE
6	CCS375 Web Technologies	III CSE	CCW332 Digital Marketing	III CSE

CS8581- NETWORKS LABORATORY

OBJECTIVES:

- To learn and use network commands.
- To learn socket programming.
- To implement and analyze various network protocols.
- To learn and use simulation tools.
- To use simulation tools to analyze the performance of various network protocols.

OUTCOMES:

Upon Completion of the course, the students will be able to:

- Implement various protocols using TCP and UDP.
- Compare the performance of different transport layer protocols.
- Use simulation tools to analyze the performance of various network protocols.
- Analyze various routing algorithms.
- Implement error correction codes.

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1. Learn to use commands like tcpdump, netstat, ifconfig, nslookup and traceroute. Capture ping and traceroute PDUs using a network protocol analyzer and examine.
2. Write a HTTP web client program to download a web page using TCP sockets.
3. Applications using TCP sockets like:
 - a) Echo client and echo server
 - b) Chat
 - c) File Transfer
4. Simulation of DNS using UDP sockets.
5. Write a code simulating ARP /RARP protocols.
6. Study of Network simulator (NS) and Simulation of Congestion Control Algorithms using NS.
7. Study of TCP/UDP performance using Simulation tool.
8. Simulation of Distance Vector/ Link State Routing algorithm.
9. Performance evaluation of Routing protocols using Simulation tool.
10. Simulation of error correction code (like CRC).

CS8662 MOBILE APPLICATION DEVELOPMENT LABORATORY

OBJECTIVES:

- To understand the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
- To understand how to work with various mobile application development frameworks.
- To learn the basic and important design concepts and issues of development of mobile applications.
- To understand the capabilities and limitations of mobile devices.

OUTCOMES:

- Upon Completion of the course, the students will be able to:
- Develop mobile applications using GUI and Layouts.
- Develop mobile applications using Event Listener.
- Develop mobile applications using Databases.
- Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi-threading and GPS.
- Analyze and discover own mobile app for simple needs.

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF EXPERIMENTS

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Write an application that draws basic graphical primitives on the screen.
4. Develop an application that makes use of databases.
5. Develop an application that makes use of Notification Manager
6. Implement an application that uses Multi-threading
7. Develop a native application that uses GPS location information
8. Implement an application that writes data to the SD card.
9. Implement an application that creates an alert upon receiving a message
10. Write a mobile application that makes use of RSS feed
11. Develop a mobile application to send an email.
12. Develop a Mobile application for simple needs (Mini Project)

CS8711 CLOUD COMPUTING LABORATORY

OBJECTIVES:

- To develop web applications in cloud
- To learn the design and development process involved in creating a cloud based application
- To learn to implement and use parallel programming using Hadoop

OUTCOMES:

- Configure various virtualization tools such as Virtual Box, VMware workstation.
- Design and deploy a web application in a PaaS environment.
- Learn how to simulate a cloud environment to implement new schedulers.
- Install and use a generic cloud environment that can be used as a private cloud.
- Manipulate large data sets in a parallel environment

LIST OF EXPERIMENTS

1. Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8.
2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
3. Install Google App Engine. Create hello world app and other simple web applications using python/java.
4. Use GAE launcher to launch the web applications.
5. Simulate a cloud scenario using Cloud Sim and run a scheduling algorithm that is not present in Cloud Sim.
6. Find a procedure to transfer the files from one virtual machine to another virtual machine.

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

7. Find a procedure to launch virtual machine using try stack (Online Open stack Demo Version)
8. Install Hadoop single node cluster and run simple applications like word count.

IT8711 - FOSS AND CLOUD COMPUTING LAB

OBJECTIVES

- To learn and use version control systems
- To develop web applications in cloud
- To learn and work with virtual machine
- To learn the design and development process involved in creating a cloud based application
- To learn to implement and use parallel programming using Hadoop

OUTCOME

- Configure various virtualization tools such as Virtual Box, VMware workstation. □
- Design and deploy a web application in a PaaS environment. □
- Learn how to simulate a cloud environment to implement new schedulers. □
- Install and use a generic cloud environment that can be used as a private cloud. □
- Install and use Hadoop

LIST OF EXPERIMENTS

1. Use gcc to compile c-programs. Split the programs to different modules and create an application using make command.
2. Use version control systems command to clone, commit, push, fetch, pull, checkout, reset, and delete repositories.
3. Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8.
4. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
5. Install Google App Engine. Create hello world app and other simple web applications using python/java.
6. Use GAE launcher to launch the web applications.
7. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
8. Find a procedure to transfer the files from one virtual machine to another virtual machine.
9. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
10. Install Hadoop single node cluster and run simple applications like wordcount.

OBJECTIVES

- To understand the python libraries for data science
- To understand the basic Statistical and Probability measures for data science.
- To learn descriptive analytics on the benchmark data sets.
- To apply correlation and regression analytics on standard data sets.
- To present and interpret data using visualization packages in Python.

OUTCOME

- Make use of the python libraries for data science
- Make use of the basic Statistical and Probability measures for data science.
- Perform descriptive analytics on the benchmark data sets.
- Perform correlation and regression analytics on standard data sets
- Present and interpret data using visualization packages in Python.

LIST OF EXPERIMENTS

1. Download, install and explore the features of NumPy, SciPy, Jupyter, Statsmodels and Pandas packages.
2. Working with Numpy arrays
3. Working with Pandas data frames
4. Reading data from text files, Excel and the web and exploring various commands for doing descriptive analytics on the Iris data set.
5. Use the diabetes data set from UCI and Pima Indians Diabetes data set for performing the following:
 - a. Univariate analysis: Frequency, Mean, Median, Mode, Variance, Standard Deviation, Skewness and Kurtosis.
 - b. Bivariate analysis: Linear and logistic regression modeling
 - c. Multiple Regression analysis
 - d. Also compare the results of the above analysis for the two data sets.
6. Apply and explore various plotting functions on UCI data sets.
 - a. Normal curves
 - b. Density and contour plots
 - c. Correlation and scatter plots
 - d. Histograms CS3361 Data Science Laboratory Lab Manual
 - e. Three dimensional plotting

7. Visualizing Geographic Data with Basemap

CS3491 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

COURSE OBJECTIVES:

The main objectives of this course are to:

- Study about uninformed and Heuristic search techniques.
- Learn techniques for reasoning under uncertainty
- Introduce Machine Learning and supervised learning algorithms
- Study about ensembling and unsupervised learning algorithms
- Learn the basics of deep learning using neural networks

COURSE OUTCOMES:

At the end of this course, the students will be able to:

CO1: Use appropriate search algorithms for problem solving

CO2: Apply reasoning under uncertainty

CO3: Build supervised learning models

CO4: Build ensembling and unsupervised models

CO5: Build deep learning neural network models

LIST OF EXPERIMENTS:

1. Implementation of Uninformed search algorithms (BFS, DFS)
2. Implementation of Informed search algorithms (A*, memory-bounded A*)
3. Implement naïve Bayes models
4. Implement Bayesian Networks
5. Build Regression models
6. Build decision trees and random forests
7. Build SVM models
8. Implement ensembling techniques
9. Implement clustering algorithms
10. Implement EM for Bayesian networks
11. Build simple NN models
12. Build deep learning NN models

CS3591 COMPUTER NETWORKS

COURSE OBJECTIVES:

- To understand the concept of layering in networks.
- To know the functions of protocols of each layer of TCP/IP protocol suite.
- To visualize the end-to-end flow of information.
- To learn the functions of network layer and the various routing protocols
- To familiarize the functions and protocols of the Transport layer

COURSE OUTCOMES:

At the end of this course, the students will be able to:

CO 1: Explain the basic layers and its functions in computer networks.

CO 2: Understand the basics of how data flows from one node to another.

CO 3: Analyze routing algorithms.

CO 4: Describe protocols for various functions in the network.

CO 5: Analyze the working of various application layer protocols.

LIST OF EXPERIMENTS:

1. Learn to use commands like tcpdump, netstat, ifconfig, nslookup and traceroute. Capture ping and trace route PDUs using a network protocol analyzer and examine.
2. Write a HTTP web client program to download a web page using TCP sockets.
3. Applications using TCP sockets like: a) Echo client and echo server b) Chat
4. Simulation of DNS using UDP sockets.
5. Use a tool like Wireshark to capture packets and examine the packets
6. Write a code simulating ARP /RARP protocols.
7. Study of Network simulator (NS) and Simulation of Congestion Control Algorithms using NS.
8. Study of TCP/UDP performance using Simulation tool.
9. Simulation of Distance Vector/ Link State Routing algorithm.
- 10, Simulation of an error correction code (like CRC)

CCS375 WEB TECHNOLOGIES

COURSE OBJECTIVES

- To understand different Internet Technologies
- To learn java-specific web services architecture
- To Develop web applications using frameworks

COURSE OUTCOMES

CO1: Construct a basic website using HTML and Cascading Style Sheets

CO2:Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.

CO3:Develop server side programs using Servlets and JSP.

CO4:Construct simple web pages in PHP and to represent data in XMLformat.

CO5:Develop interactive web applications.

LIST OF EXPERIMENTS:

1. Create a web page with the following using HTML.
 - To embed an image map in a web page.
 - To fix the hot spots.
 - Show all the related information when the hot spots are clicked.
2. Create a web page with all types of Cascading style sheets.
3. Client Side Scripts for Validating Web Form Controls using DHTML.
4. Installation of Apache Tomcat web server.
5. Write programs in Java using Servlets:
 - To invoke servlets from HTMLforms.
 - Session Tracking.
6. Write programs in Java to create three-tier applications using JSP and Databases
 - For conducting on-line examination.
 - For displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
7. Programs using XML –Schema –XSLT/XSL

CCS 335 CLOUD COMPUTING

COURSE OBJECTIVES:

- To understand the principles of cloud architecture, models and infrastructure.
- To understand the concepts of virtualization and virtual machines.
- To gain knowledge about virtualization Infrastructure.
- To explore and experiment with various Cloud deployment environments.
- To learn about the security issues in the cloud environment.

COURSE OUTCOMES:

CO1: Understand the design challenges in the cloud.

CO2: Apply the concept of virtualization and its types.

CO3: Experiment with virtualization of hardware resources and Docker.

CO4: Develop and deploy services on the cloud and set up a cloud environment.

CO5: Explain security challenges in the cloud environment.

List of Experiments:

1. Install Virtualbox/VMware/ Equivalent open source cloud Workstation with different flavours of Linux or Windows OS on top of windows 8 and above.
2. Install a C compiler in the virtual machine created using a virtual box and execute Simple Programs
3. Install Google App Engine. Create a hello world app and other simple web applications using python/java.
4. Use the GAE launcher to launch the web applications.
5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
6. Find a procedure to transfer the files from one virtual machine to another virtual machine.
7. Install Hadoop single node cluster and run simple applications like wordcount.
8. Creating and Executing Your First Container Using Docker.
9. Run a Container from Docker Hub

CS3691 EMBEDDED SYSTEMS AND IOT

COURSE OBJECTIVES:

- To learn the internal architecture and programming of an embedded processor.
- To introduce interfacing I/O devices to the processor.
- To introduce the evolution of the Internet of Things (IoT).

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

- To build a small low-cost embedded and IoT system using Arduino/Raspberry Pi/ open platform.
- To apply the concept of Internet of Things in real world scenario.

COURSE OUTCOMES:

CO1: Explain the architecture of embedded processors.

CO2: Write embedded C programs.

CO3: Design simple embedded applications.

CO4: Compare the communication models in IOT

CO5: Design IoT applications using Arduino/Raspberry Pi /open platform.

LIST OF EXPERIMENTS:

1. Write 8051 Assembly Language experiments using simulator.
2. Test data transfer between registers and memory.
3. Perform ALU operations.
4. Write Basic and arithmetic Programs Using Embedded C.
5. Introduction to Arduino platform and programming
6. Explore different communication methods with IoT devices (Zigbee, GSM, Bluetooth)
7. Introduction to Raspberry PI platform and python programming
8. Interfacing sensors with Raspberry PI
9. Communicate between Arduino and Raspberry PI using any wireless medium
10. Setup a cloud platform to log the data
11. Log Data using Raspberry PI and upload to the cloud platform
12. Design an IOT based system

CCS370 UI AND UX DESIGN

COURSE OBJECTIVES:

- To provide a sound knowledge in UI & UX
- To understand the need for UI and UX
- To understand the various Research Methods used in Design
- To explore the various Tools used in UI & UX
- Creating a wireframe and prototype

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOMES:

On completion of the course, the students will be able to:

CO1:Build UI for user Applications

CO2:Evaluate UX design of any product or application

CO3:Demonstrate UX Skills in product development

CO4:Implement Sketching principles

CO5:Create Wireframe and Prototype

LIST OF EXPERIMENTS

- 1.Designing a Responsive layout for an societal application
- 2.Exploring various UI Interaction Patterns
- 3.Developing an interface with proper UI Style Guides
- 4.Developing Wireflow diagram for application using open source software
- 5.Exploring various open source collaborative interface Platform
- 6.Hands on Design Thinking Process for a new product
- 7.Brainstorming feature for proposed product
- 8.Defining the Look and Feel of the new Project
- 9.Create a Sample Pattern Library for that product (Mood board, Fonts, Colors based on UI principles)
- 10.Identify a customer problem to solve
- 11.Conduct end-to-end user research -User research, creating personas, Ideation process (User stories, Scenarios), Flow diagrams, Flow Mapping
- 12.Sketch, design with popular tool and build a prototype and performusability testing and identify improvements

CCW332 DIGITAL MARKETING

COURSE OBJECTIVES:

- The primary objective of this module is to examine and explore the role and importance of digital marketing in today's rapidly changing business environment.
- It also focuses on how digital marketing can be utilized by organizations and how its effectiveness can be measured.

COURSE OUTCOMES:

CO1: To examine and explore the role and importance of digital marketing in today's rapidly changing business environment..

CO2: To focuses on how digital marketing can be utilized by organizations and how its effectiveness can be measured.

CO3:To know the key elements of a digital marketing strategy.

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO4: To study how the effectiveness of a digital marketing campaign can be measured

CO5: To demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs.

List of Experiments:

1. Subscribe to a weekly/quarterly newsletter and analyze how its content and structure aid with the branding of the company and how it aids its potential customer segments.
2. Perform keyword search for a skincare hospital website based on search volume and competition using Google keyword planner tool.
3. Demonstrate how to use the Google WebMasters Indexing API
4. Discuss an interesting case study regarding how an insurance company manages leads.
5. Discuss negative and positive impacts and ethical implications of using social media for political advertising.
6. Discuss how Predictive analytics is impacting marketing automation