



## DEPARTMENT OF INFORMATION TECHNOLOGY

R 2013

### COURSE OUTCOMES:

#### SEM –I

#### GE6151 – COMPUTER PROGRAMMING

Course Code	Course Outcomes
C105.1 (CO1)	Understand the organization of a digital computer.
C105.2 (CO2)	Be exposed to the number systems
C105.3 (CO3)	Ability to think logically and write pseudo code or draw flow charts for problems.
C105.4 (CO4)	Ability to use arrays, strings, functions, pointers, structures and unions in C.
C105.5 (CO5)	Design C Programs for problems
C105.6 (CO6)	Write and execute C programs for simple applications

#### GE6161-COMPUTER PRACTICES LABORATORY

Course Code	Course Outcomes
C107.1 (CO1)	Be familiar with the use of Office software.
C107.2 (CO2)	Be exposed to presentation and visualization tools.
C107.3 (CO3)	Be exposed to problem solving techniques and flow charts.
C107.4 (CO4)	Apply good programming design methods for program development.
C107.5 (CO5)	Design and implement C programs for simple applications.
C107.6 (CO6)	Develop recursive programs.

#### SEM –II

#### CS6202-PROGRAMMING AND DATA STRUCTURES I

Course Code	Course Outcomes
C115.1 (CO1)	Use the control structures of C appropriately for problems.
C115.2 (CO2)	Implement abstract data types for linear data structures.



C115.3 (CO3)	Apply the different linear data structures to problem solutions.
C115.4 (CO4)	Critically analyse the various algorithms
C115.5 (CO5)	Implement different data structure in C.
C115.6 (CO6)	Apply sorting, searching, hashing algorithms.

## IT6212-PROGRAMMING AND DATA STRUCTURES LABORATORY I

Course Code	Course Outcomes
C118.1 (CO1)	Design and implement C programs for implementing stacks, queues, linked lists.
C118.2 (CO2)	Apply good programming design methods for program development.
C118.3 (CO3)	Apply the different data structures for implementing solutions to practical problems.
C118.4 (CO4)	Develop sorting programs.
C118.5 (CO5)	Implementation of Linear search and Binary Search.
C118.6 (CO6)	Implement Representation of records using Structures in C and can Manipulate records in a Linked List.



## III-SEMESTER

### MA6351-TRANSFORM AND PARTIAL DIFFERENTIAL EQUATIONS

Course Code	Course Outcomes
C201.1 (CO1)	To describe real time engineering problems using PDEs.
C201.2 (CO2)	Using Dirchlet's conditions, solving Fourier series problems.
C201.3 (CO3)	To apply Fourier series methods to solve boundary value problems.
C201.4 (CO4)	To know the basic properties of the Fourier transform, describe the Fourier integral theorem and convolution theorem.
C201.5 (CO5)	To use the Z- transform as the tool to connect the time domain and frequency domain in signal processing.
C201.6 (CO6)	The course will also serve as a prerequisite for post graduate and specialized studies and research

### CS 6301-PROGRAMMING AND DATA STRUCTURES-II

Course Code	Course Outcomes
C202.1 (CO1)	Be familiar with the Basic C++ concepts, abstraction and encapsulation.
C202.2 (CO2)	Learn about oops concepts, constructor, polymorphism and Inheritance.
C202.3 (CO3)	Understanding C++ Programming advanced features Exception handling, Generic Programming and File handling.
C202.4 (CO4)	Interpret Advanced Nonlinear Tree Data Structure.
C202.5 (CO5)	Be exposed to graph algorithms.
C202.6 (CO6)	Learn to apply Tree and Graph Data Structures.



## CS6302-DATA BASE MANAGEMENT SYSTEMS

Course Code	Course Outcomes
C203.1 (CO1)	Define the fundamental elements of database management systems
C203.2 (CO2)	Analyse the basic concepts of relational data model and entity-relationship model
C203.3 (CO3)	Outline relational database design, relational algebra and database language SQL
C203.4 (CO4)	Explain the concepts of query processing, transaction management and file storage
C203.5 (CO5)	Analyze functional dependencies for designing a robust database
C203.6 (CO6)	Implement transactions, concurrency control, and be able to do Database recovery and Query optimization

## CS6303-COMPUTER ARCHITECTURE

Course Code	Course Outcomes
C204.1 (CO1)	Understand the functions and operations of digital computer
C204.2 (CO2)	Design arithmetic and logic unit
C204.3 (CO3)	Devise and analyze pipelined control units
C204.4 (CO4)	Evaluate performance of memory systems
C204.5 (CO5)	Comprehend parallel processing architectures and memory hierarchies
C204.6 (CO6)	Appreciate different ways of communicating with I/O devices and interfaces

## CS6304 - ANALOG AND DIGITAL COMMUNICATION

Course Code	Course Outcomes
C205.1 (CO1)	Understanding the basics of analog communication technique.
C205.2 (CO2)	Understanding various digital modulation schemes.
C205.3 (CO3)	Design and analyze various data communication systems.
C205.4 (CO4)	Design and analyze various error coding and source coding techniques.
C205.5 (CO5)	Discuss the concept of multi user radio communication system and access techniques.

C205.6  
(CO6)

Analyze various pulse coding techniques.



## GE6351 - ENVIRONMENTAL SCIENCE AND ENGINEERING

Course Code	Course Outcomes
C206.1 (CO1)	To interpret the relationship between living organisms and the environment and to identify the threats to global biodiversity.
C206.2 (CO2)	To identify and prevent the problems related to the pollution of air, water, soil, marine, etc
C206.3 (CO3)	To understand the importance of natural resources and to conserve it for future generation.
C206.4 (CO4)	To analyse the social issues of the environment to be a part of sustainable development.
C206.5 (CO5)	To create awareness and sustainable population growth and know the contribution of information technology in environmental management.
C206.6 (CO6)	To study the integrated themes and biodiversity, natural resources, pollution control, waste management for protecting environment from degradation

## IT6311- PROGRAMMING AND DATA STRUCTURES LAB-II

Course Code	Course Outcomes
C207.1 (CO1)	Apply Object Oriented Concepts to develop simple C++ Programs.
C207.2 (CO2)	Design and implement C++ programs for manipulating stacks, queues, linked lists, trees, and graphs.
C207.3 (CO3)	Developing File Handling Programs for Sequential and Random access.
C207.4 (CO4)	Apply the different data structures for implementing solutions to practical problems.
C207.5 (CO5)	Develop recursive programs using trees and graphs.
C207.6 (CO6)	Implement the programs to interpret searching and sorting .

## IT6312 DATABASE MANAGEMENT SYSTEMS LAB

Course Code	Course Outcomes
C208.1 (CO1)	Design and implement a database schema for a given problem-domain.
C208.2 (CO2)	Create the tables by properly specifying the primary keys and the foreign keys.
C208.3 (CO3)	Formulate Query for a given Database using PL / SQL.
C208.4 (CO4)	Understand the concepts of cursors and triggers
C208.5 (CO5)	Illustrate the concept of generating suitable reports.
C208.6 (CO6)	Develop the projects using Microsoft visual basic and SQL



## IT 6313 DIGITAL COMMUNICATION LABORATORY

Course Code	Course Outcomes
C209.1 (CO1)	Analyze sampling and reconstruction of the signal.
C209.2 (CO2)	Understanding the basic concepts of analog modulation methods.
C209.3 (CO3)	Discuss pulse code and delta modulation schemes.
C209.4 (CO4)	Describe the digital modulation and multiplexing methods.
C209.5 (CO5)	Understanding the digital modulation and coding schemes through simulation.
C209.6 (CO6)	Discuss spread spectrum technique and communication link through simulation.

## IV SEMESTER

### MA6453 PROBABILITY AND QUEUEING THEORY

Course Code	Course Outcomes
C210.1 (CO1)	Define the concept of random variable and its properties. Construct probabilistic models for observed phenomena through distributions which play an important role in many engineering applications.
C210.2 (CO2)	Identify random variables by designing joint distributions and correlate the random variables.
C210.3 (CO3)	Define the concept of random processes and its classification, in particular about Markov chains, which play an important role in finding solution of many engineering problems.
C210.4 (CO4)	Identify the queuing model in the given system and find the performance measures to analyse the result in real time situation.
C210.5 (CO5)	Introduce non markovian queuing model which helps in analysing various queueing networks. Applications emphasize communication networks and computer operations, but may include examples from transportation, manufacturing, and the service industry.
C210.6 (CO6)	Helps to develop probabilistic models under several areas of science and engineering.



## EC 6504-MICROPROCESSOR & MICROCONTROLLER

Course Code	Course Outcomes
C211.1 (CO1)	Understand architecture and operations of a microprocessor & Microcontroller system in depth.
C211.2 (CO2)	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the microprocessor.
C211.3 (CO3)	Analyze, specify, design, write and test assembly language programs of moderate complexity.
C211.4 (CO4)	Perform the detailed hardware design of a microprocessor & microcontroller system, and program the microprocessor using suitable techniques and software tools
C211.5 (CO5)	Design electrical circuitry to the Microprocessor & Microcontroller I/O ports in order to interface the processor to external devices
C211.6 (CO6)	Design and Implementation of electronic system using appropriate microprocessor/Microcontroller, programming, Interfacing and troubleshooting techniques





## CS6402- DESIGN AND ANALYSIS OF ALGORITHMS

Course Code	Course Outcomes
C212.1 (CO1)	Interpret the fundamental needs of algorithms in problem solving.
C212.2 (CO2)	Classify the different algorithm design techniques for problem solving.
C212.3 (CO3)	Develop algorithms for various computing problems.
C212.4 (CO4)	Analyze the time and space complexity of various algorithms.
C212.5 (CO5)	Identify the limitations of algorithms in problem solving.
C212.6 (CO6)	Synthesize efficient algorithm in common engineering design situations.

## CS6401 -OPERATING SYSTEMS

Course Code	Course Outcomes
C213.1 (CO1)	Understand the basics of operating systems like system calls, system programs ,system structure ,process and its operations, threads
C213.2 (CO2)	Outline various threading models, process synchronization deadlocks implements the various CPU scheduling algorithms and deadlocks.
C213.3 (CO3)	Compare and contrast various memory management techniques like segmentation, paging and concept of thrashing.
C213.4 (CO4)	Use disk management, disk scheduling algorithms and file system for better utilization of external memory.
C213.5 (CO5)	Understanding Linux –memory management, File and I/O system and utilize local network services.
C213.6 (CO6)	Designing and Implementing the various concepts of Linux server and its functionalities

## CS6403 SOFTWARE ENGINEERING

Course Code	Course Outcomes
C214.1 (CO1)	Explain the software engineering process and project management.
C214.2 (CO2)	Demonstrate software requirements and analysis.
C214.3 (CO3)	Outline the software design process and user interface.
C214.4 (CO4)	Compare and contrast various software testing.
C214.5 (CO5)	Discuss about the software integration and project management.
C214.6 (CO6)	Demonstrate an ability to use the techniques and tools necessary for engineering practice



## IT6411 –MICROPROCESSOR AND MICROCONTROLLER LAB

Course Code	Course Outcomes
C215.1 (CO1)	Apply programming concept for various applications using microprocessors and microcontrollers.
C215.2 (CO2)	An in-depth knowledge of applying the concepts on real- time applications.
C215.3 (CO3)	Solid foundation on interfacing the external devices to the processor and controllers according to the user requirements to create novel products and solutions for the real time problems.
C215.4 (CO4)	Understanding of industrial environment aware of excellence guidelines and lifelong learning needed for a successful professional career in embedded and real time system design.
C215.5 (CO5)	Exposing the students to design work where there is no single correct solution, rather competing objectives; and to encourage cooperative team work and develop communication skills.
C215.6 (CO6)	Apply software tools for better programming.

## IT6412 -OPERATING SYSTEMS LAB

Course Code	Course Outcomes
C216.1 (CO1)	Experiment with Unix commands and shell programming.
C216.2 (CO2)	Choose the best CPU scheduling algorithm for a given problem instance.
C216.3 (CO3)	Build 'C' program for file allocation technique and file Organization techniques.
C216.4 (CO4)	Implement the Producer – Consumer problem using semaphores, shared memory &IPC.
C216.5 (CO5)	Develop algorithm for deadlock avoidance and detection.
C216.6 (CO6)	Identify the performance of various paging, page replacement algorithms, threading and synchronization.



## IT6413 SOFTWARE ENGINEERING LAB

Course Code	Course Outcomes
C217.1 (CO1)	Identify the requirements according to the objective.
C217.2 (CO2)	Use open source case tools to design a software system.
C217.3 (CO3)	Design the individual module of the given project.
C217.4 (CO4)	Make the design using modeling diagram.
C217.5 (CO5)	Demonstrate software development from design.
C217.6 (CO6)	Demonstrate an ability to use the techniques and tools necessary for engineering practice.



## V SEMESTER

### CS6551 COMPUTER NETWORKS

Course Code	Course Outcomes
C301.1 (CO1)	Understand the network components and OSI Layer functionalities,
C301.2 (CO2)	Classify the Media Access Control and Internetworking Protocols,
C301.3 (CO3)	Demonstrate various types of routing techniques,
C301.4 (CO4)	Describe the different functionalities of transport layer,
C301.5 (CO5)	Explain application layer protocols,
C301.6 (CO6)	Acquire the knowledge about different Networking devices.

### IT6501 GRAPHICS AND MULTIMEDIA

Course Code	Course Outcomes
C302.1 (CO1)	Effectively and creatively solve 2D graphic design problems
C302.2 (CO2)	Effectively and creatively solve 3D graphic design problems
C302.3 (CO3)	Form effective and compelling interactive experiences for a wide range of audiences.
C302.4 (CO4)	Use various software programs used in the creation and implementation of multi-media (interactive, motion/animation, presentation, etc.).
C302.5 (CO5)	Discuss issues related to emerging electronic technologies and graphic design
C302.6 (CO6)	Effectively and creatively solve a wide range of graphic design problems

### CS 6502- OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code	Course Outcomes
C303.1 (CO1)	Comprehend object oriented methodologies and relationships between objects and classes in UML
C303.2 (CO2)	Apply UML notations to develop various UML diagrams for the given scenario
C303.3 (CO3)	Illustrate and Identify the objects and its responsibilities using traditional techniques
C303.4 (CO4)	Find the static and dynamic behavior of objects about document creation for the given scenario



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C303.5 (CO5)	Compare and contrast various testing techniques.
C303.6 (CO6)	Synthesize and develop real time applications based on object oriented methodologies using UML diagrams.



## IT6502 -DIGITAL SIGNAL PROCESSING

Course Code	Course Outcomes
C304.1 (CO1)	Define basics of signals and systems, explain sampling theorem to convert analog to discrete signals and show how z transform and its properties are used as a mathematical tool in learning signals and systems.
C304.2 (CO2)	Apply Discrete Fourier Transform and its properties to discrete time signals and systems.
C304.3 (CO3)	Analyze digital IIR filters and model them using realization structures.
C304.4 (CO4)	Prove that FIR digital filters are advantageous over IIR digital filters and model them using realization structures.
C304.5 (CO5)	Discuss the behavior of digital filters on the effect of finite word length.
C304.6 (CO6)	Design digital IIR and FIR filters and solve digital signal processing problems using transforms.

## IT6503 WEB PROGRAMMING

Course Code	Course Outcomes
C305.1 (CO1)	To describe the World Wide Web and its emphasis on the current communication trend.
C305.2 (CO2)	To evaluate the static web contents and dynamic web contents of world wide web.
C305.3 (CO3)	Develop simple Java applications with JDBC connectivity.
C305.4 (CO4)	Able to write Simple java programs using Classes, Inheritance, Exception handling and applets.
C305.5 (CO5)	Demonstrate the advanced J2EE concepts using Servlets, Java RMI and EJB.
C305.6 (CO6)	To develop the web applications for different end users by using set of development tools like XHTML, CSS, JavaScript, XML, PHP.



## EC6801-WIRELESS COMMUNICATION

Course Code	Course Outcomes
C306.1 (CO1)	Understand the basic concepts of wireless communication system.
C306.2 (CO2)	Investigate the characteristics of various wireless channels.
C306.3 (CO3)	Realize the basic cellular and multiple access concepts.
C306.4 (CO4)	Compare various digital modulation techniques and its performance.
C306.5 (CO5)	Examine various diversity concepts and MIMO systems.
C306.6 (CO6)	Analyze different techniques to mitigate the issues in wireless fading channels.

## IT6511 NETWORK LAB

Course Code	Course Outcomes
C307.1 (CO1)	Implement the various protocols.
C307.2 (CO2)	Analyze various routing algorithms
C307.3 (CO3)	Implementation of RPC and Sub netting
C307.4 (CO4)	Analyze the performance of the protocols in different layers
C307.5 (CO5)	Demonstrate routing techniques using simulation tools
C307.6 (CO6)	Illustrate the Applications of TCP and UDP

## IT6512 WEB PROGRAMMING LAB

Course Code	Course Outcomes
C308.1 (CO1)	Define Web and Implement the concept of web page development to design real world applications.
C308.2 (CO2)	Compare the development of the web application performance using different set of web development tools like HTML, XHTML, CSS, JAVASCRIPT and XML.
C308.3 (CO3)	Apply the usage of web development tools to serve the purpose of different end users of Internet.
C308.4 (CO4)	Interpret an existing static web application to make it a robust one and Integrate dynamic features of web development.
C308.5 (CO5)	Utilize network integrated development environment (IDE) and various platforms to monitor develop and use web applications.



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C308.6 (CO6)	Design and Implement database and web services applications.
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## IT6513-CASE TOOLS LABORATORY

Course Code	Course Outcomes
C309.1 (CO1)	Identify the requirements of project according to the objective
C309.2 (CO2)	Construct USE CASE model to identify the classes and functionality of the system
C309.3 (CO3)	Design the individual module of the given project
C309.4 (CO4)	Make design with modeling diagrams
C309.5 (CO5)	Add interface to System Designs.
C309.6 (CO6)	Demonstrate Software Development from design

## VI SEMESTER

### CS6601- DISTRIBUTED SYSTEMS

Course Code	Course Outcomes
C310.1 (CO1)	Comprehend the application and challenges of distributed system
C310.2 (CO2)	Outline the communication in distributed systems and model communication between two processes using RMI
C310.3 (CO3)	Explain and analyze various peer to peer services and distributed file system
C310.4 (CO4)	Exhibit concurrency control and properties of transaction in Distributed systems
C310.5 (CO5)	Realize the issues involved in process and resource management
C310.6 (CO6)	Evaluate various applications using distributed techniques.



## IT6601 MOBILE COMPUTING

Course Code	Course Outcomes
C311.1 (CO1)	Understand the importance of mobile computing and their MAC allocation schemes .
C311.2 (CO2)	Comprehend transport and mobile Internet protocol architecture and their routing schemes.
C311.3 (CO3)	Learn Architecture and services provided by various mobile telecommunication systems.
C311.4 (CO4)	Analyze the different services of telecommunication system
C311.5 (CO5)	Understand mobile Ad-hoc networks and evaluate the performance of various routing protocols.
C311.6 (CO6)	Aware of various mobile operating system and real time applications.

## CS6659- ARTIFICIAL INTELLIGENCE

Course Code	Course Outcomes
C312.1 (CO1)	Identify problems that are amenable to solution by AI methods.
C312.2 (CO2)	Identify appropriate AI methods to solve a given problem.
C312.3 (CO3)	Formalize a given problem in the language/framework of different AI methods.
C312.4 (CO4)	Implement basic AI algorithms.
C312.5 (CO5)	Design and carry out an empirical evaluation of different algorithms.
C312.6 (CO6)	On problem formalization, and state the conclusions that the evaluation supports.



## CS6660 -COMPILER DESIGN

Course Code	Course Outcomes
C313.1 (CO1)	Describe the theory and practice of compilation and implement a lexical analyzer from a specification of a language's lexical rules.
C313.2 (CO2)	Illustrate the translation of regular expression into parse tree using syntax analyzer.
C313.3 (CO3)	Use Flex or similar tools to create a lexical analyzer and YACC/ Bison tools to create a parser.
C313.4 (CO4)	Construct the intermediate representation considering the type systems.
C313.5 (CO5)	Apply the optimization techniques for the generated code.
C313.6 (CO6)	Use the different compiler construction tools to develop a simple compiler.

## IT6602- SOFTWARE ARCHITECTURE

Course Code	Course Outcomes
C314.1 (CO1)	Explain influence of software architecture on business and technical activities.
C314.2 (CO2)	Identify key architectural structures.
C314.3 (CO3)	Use styles and views to specify architecture.
C314.4 (CO4)	Examine the architectural styles.
C314.5 (CO5)	Design document for a given architecture.
C314.6 (CO6)	Be familiar with architectures for emerging technologies.



## GE6757 TOTAL QUALITY MANAGEMENT

Course Code	Course Outcomes
C315.1 (CO1)	Students will be able to gain basic knowledge in total quality management relevant to both manufacturing and service industry including IT sector.
C315.2 (CO2)	To make students to aware of TQM concepts like customer Focus, Employee Focus and their involvement, continuous process improvement and Supplier Management.
C315.3 (CO3)	Students will be able to implement the basic principles of TQM in manufacturing and service based organization.
C315.4 (CO4)	To provide exposure to students on the basic and new seven management tools, Quality concepts like Six sigma, Failure mode effect analysis.
C315.5 (CO5)	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes
C315.6 (CO6)	To explore industrial applications of Quality function deployment, taguchi quality concepts and TPM.

## IT6611 MOBILE APPLICATION DEVELOPMENT LABORATORY

Course Code	Course Outcomes
C316.1 (CO1)	Know the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
C316.2 (CO2)	Understand how to work with various mobile application development frameworks.
C316.3 (CO3)	Learn the basic and important design concepts and issues of development of Mobile Application.
C316.4 (CO4)	Understand the capabilities and limitations of mobile devices.
C316.5 (CO5)	Understand the capabilities and limitations of database.
C316.6 (CO6)	To Implement the mobile application for android devices.

## IT6612 COMPILER DESIGN LAB

Course Code	Course Outcomes
C317.1 (CO1)	Understanding the basic concepts of compiler writing tools.
C317.2 (CO2)	Implement the different Phases of compiler.
C317.3 (CO3)	Model with control flow and data flow analysis.
C317.4 (CO4)	List simple optimization techniques.
C317.5	Apply the optimization techniques for the generated code.



(CO5)	
C317.6 (CO6)	Construct the different compiler construction tools to develop a simple compiler.

## GE6674 COMMUNICATION AND SOFT SKILLS LAB

Course Code	Course Outcomes
C318.1 (CO1)	To equip students of Engineering & Technology with effective listening skills.
C318.2 (CO2)	Develop creative thinking skills, improve vocabulary & Language style.
C318.3 (CO3)	Aware of the Technical Tarragons and various skills like Problem solving and Decision making.
C318.4 (CO4)	Develop soft skills, interpersonal skills and evolves self-confidence.
C318.5 (CO5)	Make presentations and participate in GD
C318.6 (CO6)	Make presentations and participate in international exams

## VII SEMESTER

### IT6701 INFORMATION MANAGEMENT

Course Code	Course Outcomes
C401.1 (CO1)	Understand core relational database topics including logical and physical design and modeling and Design, Create and maintain data warehouses.
C401.2 (CO2)	Analyze security issues and various methods to solve the issues for effective information management.
C401.3 (CO3)	Infer depth knowledge in Master Data Management (MDM).
C401.4 (CO4)	Analyzing different components of information architecture.
C401.5 (CO5)	Design and implement a complex information system that meets regulatory requirements.
C401.6 (CO6)	Demonstrate recent advances in NOSQL, Big Data and related tools.

### CS 6701 CRYPTOGRAPHY AND NETWORK SECURITY

Course Code	Course Outcomes
C402.1 (CO1)	Explain the basics of number theory and compare various encryption techniques
C402.2 (CO2)	Summarize the functionality of public key cryptography



C402.3 (CO3)	Apply various message authentication functions and secure algorithms
C402.4 (CO4)	Demonstrate different types of security systems and applications.
C402.5 (CO5)	Discuss different levels of security and services.
C402.6 (CO6)	To create secure coding in the developed applications



## IT6702 DATAWAREHOUSING AND DATA MINING

Course Code	Course Outcomes
C403.1 (CO1)	Understanding the concepts of data warehouse, its representation using various schemas and how to build data warehouse and map it to multiprocessor Architecture.
C403.2 (CO2)	Familiarizing with the tools and techniques used for business analysis like tools for Querying and Reporting, Online Analytical processing, and tools supporting
C403.3 (CO3)	Acquainting the concepts of data mining, steps involved in Knowledge discovery from databases.
C403.4 (CO4)	classification of data mining process and their functionality.
C403.5 (CO5)	Understanding the concepts of Association Rule mining and classification, algorithms used for rule mining and classification with the data.
C403.6 (CO6)	Acquainting the concepts of clustering, different methods of clustering and algorithms for different clustering categories and application of Data mining in different fields.

## CS6703 -GRID AND CLOUD COMPUTING

Course Code	Course Outcomes
C404.1 (CO1)	Able to identify distributed computing
C404.2 (CO2)	Apply grid computing techniques to solve large scale scientific problems
C404.3 (CO3)	Apply the concept of virtualization
C404.4 (CO4)	Use the grid and cloud tool kits
C404.5 (CO5)	Apply the security models in the grid and the cloud environment
C404.6 (CO6)	Apply the knowledge of grid and cloud

## IT 6004 SOFTWARE TESTING

Course Code	Course Outcomes
C405.1 (CO1)	Understand the need for software testing
C405.2 (CO2)	Expertise in the various testing strategies followed and the use of various testing tools
C405.3 (CO3)	Design test cases based on test criteria
C405.4 (CO4)	Illustrate the methods of Test Planning and skills needed by tester
C405.5 (CO5)	Design and automate high quality tests during unit and integration testing
C405.6 (CO6)	Exhibit Proficiency to apply software testing techniques in commercial environments



## IT6711 DATA WAREHOUSING AND DATA MINING LAB

Course Code	Course Outcomes
C406.1 (CO1)	Creation of data warehouse using Postgresql.
C406.2 (CO2)	Implementing Association rule mining algorithms using WEKA tool.
C406.3 (CO3)	Implementing Classification algorithms using WEKA tool.
C406.4 (CO4)	Implementing Clustering algorithms using WEKA tool.
C406.5 (CO5)	Implementing Text mining and Web mining using R tool.
C406.6 (CO6)	Learnt Open source tools like Postgresql, WEKA and R tool.

## IT6712 SECURITY LABORATORY

Course Code	Course Outcomes
C407.1 (CO1)	Apply the cryptographic algorithms for data communication
C407.2 (CO2)	Compare the performance of various security algorithms
C407.3 (CO3)	Apply the Digital signature for secure data transmission
C407.4 (CO4)	Utilize the different open source tools for network security and analysis
C407.5 (CO5)	Demonstrate intrusion detection system using network security tool.
C407.6 (CO6)	To create secure coding in the developed applications.

## IT6713 GRID AND CLOUD COMPUTING LABORATORY

Course Code	Course Outcomes
C408.1 (CO1)	Use the grid and cloud tool kits.
C408.2 (CO2)	Design and implement applications on the Grid.
C408.3 (CO3)	Design and Implement applications on the Cloud.
C408.4 (CO4)	Implement virtualization.
C408.5 (CO5)	Deploy hadoop one node cluster.





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Sai Leo Nagar, West Tambaram, Chennai - 600 044. [www.sairamit.edu.in](http://www.sairamit.edu.in)



C408.6 (CO6)	Implement Hadoop API.
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## VIII SEMESTER

### IT6801 SERVICE ORIENTED ARCHITECTURE

Course Code	Course Outcomes
C409.1 (CO1)	Learn XML fundamentals.
C409.2 (CO2)	Build applications based on XML.
C409.3 (CO3)	Understand the key principles behind SOA
C409.4 (CO4)	Develop web services using technology elements.
C409.5 (CO5)	Build SOA-based applications for intra-enterprise and inter-enterprise applications
C409.6 (CO6)	Learn the various web service standards

### GE6075 -PROFESSIONAL ETHICS IN ENGINEERING

Course Code	Course Outcomes
C410.1 (CO1)	Understand the core values that shape the ethical behavior of an engineer and Exposed awareness on professional ethics and human values.
C410.2 (CO2)	Understand the basic perception of profession, professional ethics, various moral issues & uses of ethical theories
C410.3 (CO3)	Understand various social issues, industrial standards, code of ethics and role of professional ethics in engineering field
C410.4 (CO4)	Aware of responsibilities of an engineer for safety and risk benefit analysis, professional rights and responsibilities of an engineer.
C410.5 (CO5)	Acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives
C410.6 (CO6)	Demonstrate appropriate and professional ethical behavior.

### BM6005 BIO INFORMATICS

Course Code	Course Outcomes
C411.1 (CO1)	Learning about the need for Bioinformatics Technologies
C411.2 (CO2)	Exposed to the applications of Data warehousing and Data Mining in Bio-informatics.
C411.3 (CO3)	Familiarizing with the modeling techniques for bio-informatics.
C411.4 (CO4)	Understand the fundamentals of Pattern matching and Visualization
C411.5 (CO5)	Learning micro array analysis and its application to genomic expression study



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C411.6 (CO6)	Develop models, apply matching techniques to bio-informatics data.
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## MG6088 SOFTWARE PROJECT MANAGEMENT

Course Code	Course Outcomes
C412.1 (CO1)	Able to evaluate the project and can perform project planning
C412.2 (CO2)	Able to estimate the budget for the project.
C412.3 (CO3)	Ability to implement activity planning models and analyzing software risks by Risk management strategies.
C412.4 (CO4)	Ability to manage and control projects.
C412.5 (CO5)	Ability to manage people in an organization.
C412.6 (CO6)	Outline the need for Software Project Management and different techniques for software cost estimation.

## IT6811 – PROJECT WORK

Course Code	Course Outcomes
C413.1 (CO1)	Identify the problem by applying acquired knowledge
C413.2 (CO2)	Analyze and categorize executable project modules after considering risks.
C413.3 (CO3)	Choose efficient tools for designing project modules.
C413.4 (CO4)	Combine all the modules through effective team work after efficient testing
C413.5 (CO5)	Elaborate the completed task and compile the project report.
C413.6 (CO6)	Identify the problem by applying acquired knowledge



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## COURSE OUTCOMES:

### SEMESTER –I

#### GE8151/ PROBLEM SOLVING AND PYTHON PROGRAMMING

Course Code	Course Outcomes
C105.1 (CO1)	Develop algorithmic solutions to simple computational problems.
C105.2 (CO2)	Demonstrate programs using simple Python statements and expressions
C105.3 (CO3)	Explain control flow and functions concept in Python for solving problems
C105.4 (CO4)	Use Python data structures – lists, tuples & dictionaries for representing compound data.
C105.5 (CO5)	Explain files, exception, modules and packages in Python for solving problems.

#### GE8161/ PROBLEM SOLVING AND PYTHON PROGRAMMING LAB

Course Code	Course Outcomes
C107.1 (CO1)	Develop solutions to simple computational problems using Python programs.
C107.2 (CO2)	Solve problems using conditionals and loops in Python.
C107.3 (CO3)	Develop Python programs by defining functions and calling them.
C107.4 (CO4)	Use Python lists, tuples and dictionaries for representing compound data.
C107.5 (CO5)	Develop Python programs using files.

### SEMESTER –II

#### IT8201/INFORMATION TECHNOLOGY ESSENTIALS

Course Code	Course Outcomes
C113.1 (CO1)	Design and deploy web-sites
C113.2 (CO2)	Design and deploy simple web-applications
C113.3 (CO3)	Create simple database applications
C113.4 (CO4)	Develop information system



C113.5 (CO5)	Describe the basics of networking and mobile communications
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## CS8251/PROGRAMMING IN C

Course Code	Course Outcomes
C114.1 (CO1)	Develop simple applications in C using basic constructs
C114.2 (CO2)	Design and implement applications using arrays and strings
C114.3 (CO3)	Develop and implement applications in C using functions and pointers.
C114.4 (CO4)	Develop applications in C using structures.
C114.5 (CO5)	Design applications using sequential and random access file processing

## CS8261/C PROGRAMMING LABORATORY

Course Code	Course Outcomes
C116.1 (CO1)	Apply and practice logical formulations to solve some simple problems leading to specific applications.
C116.2 (CO2)	Develop C programs for simple applications making use of basic constructs, arrays and strings.
C116.3 (CO3)	Demonstrate C programming development environment, compiling, debugging, linking and executing a program using the development environment.
C116.4 (CO4)	Develop C programs involving functions, recursion, pointers, and structures.
C117.5 (CO5)	Design applications using sequential and random access file processing

## IT8211/INFORMATION TECHNOLOGY ESSENTIALS LABORATORY

Course Code	Course Outcomes
C117.1 (CO1)	Design interactive websites using HTML TAGS .
C117.2 (CO2)	Create client and server program using PHP.
C117.3 (CO3)	Design dynamic websites and handle multimedia components.
C117.4 (CO4)	Create application with PHP connected to Database.
C117.5 (CO5)	Create personal information system.



## III SEMESTER

MA8351

### DISCRETE MATHEMATICS

Course Code	Course Outcomes
C201.1 (CO1)	Have knowledge of the concepts needed to test the logic of a program
C201.2 (CO2)	Have an understanding in identifying structures on many levels
C201.3 (CO3)	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
C201.4 (CO4)	Be aware of the counting principles.
C201.5 (CO5)	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

### CS 8351 DIGITAL PRINCIPLES & SYSTEM DESIGN

Course Code	Course Outcomes
C202.1 (CO1)	Simplify Boolean functions using KMap.
C202.2 (CO2)	Design and Analyze Combinational and Sequential Circuits
C202.3 (CO3)	Implement designs using Programmable Logic Devices.
C202.4 (CO4)	Write HDL codes for combinational and sequential circuits
C202.5 (CO5)	Understand and compare the concepts of programmable logic devices

### CS 8391 DATA STRUCTURES

Course Code	Course Outcomes
C203.1 (CO1)	Implement ADT for abstract data types for linear data structures
C203.2 (CO2)	Implement ADT for abstract data types for Non - Linear data structures
C203.3 (CO3)	Apply the different linear and non-linear data structures to problem solutions
C203.4 (CO4)	Investigate various searching, Hashing techniques
C203.5 (CO5)	Critically analyze the various sorting algorithms



## CS8392 OBJECT ORIENTED PROGRAMMING

Course Code	Course Outcomes
C204.1 (CO1)	Develop Java programs using OOP principles
C204.2 (CO2)	Develop Java programs with the concepts inheritance and interfaces
C204.3 (CO3)	Build Java applications using exceptions and I/O streams
C204.4 (CO4)	Develop Java applications with threads and generics classes
C204.5 (CO5)	Develop interactive Java programs using swings

## EC8394 ANALOG AND DIGITAL COMMUNICATION

Course Code	Course Outcomes
C205.1 (CO1)	Apply analog and digital communication techniques.
C205.2 (CO2)	Use data and pulse communication techniques.
C205.3 (CO3)	Analyze Source and Error control coding.
C205.4 (CO4)	Utilize multi-user radio communication
C205.5 (CO5)	Analyze various pulse coding technique

## CS 8381 DATA STRUCTURES LAB

Course Code	Course Outcomes
C206.1 (CO1)	Implement linear and non linear DS operations
C206.2 (CO2)	Use the linear and nonlinear data structure operations for a given problem
C206.3 (CO3)	Implement searching and sorting algorithms
C206.4 (CO4)	Implement hashing techniques
C206.5 (CO5)	Apply the use of graphs and trees





## CS8383 OBJECT ORIENTED PROGRAMMING LABORATORY

Course Code	Course Outcomes
C207.1 (CO1)	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
C207.2 (CO2)	Develop and implement Java programs with arraylist, exception handling and multithreading.
C207.3 (CO3)	Design applications using file processing, generic programming and event handling.
C207.4 (CO4)	Develop and implement Java programs with exception handling
C207.5 (CO5)	Develop and implement Java programs with multithreading.

## CS8382 DIGITAL SYSTEMS LABORATORY

Course Code	Course Outcomes
C208.1 (CO1)	Understand basic logic gates.
C208.2 (CO2)	Implement combinational circuits using MSI devices
C208.3 (CO3)	Implement sequential circuits like registers and counters
C208.4 (CO4)	Simulate combinational and sequential circuits using HDL
C208.5 (CO5)	Implement simplified combinational circuits

## HS8381 - INTERPERSONAL SKILLS/LISTENING & SPEAKING

Course Code	Course Outcomes
C209.1 (CO1)	Listen and respond appropriately
C209.2 (CO2)	Participate in Group Discussions
C209.3 (CO3)	Make effective Presentations
C209.4 (CO4)	Participate confidently and appropriately in conversations both formal and informal
C209.5 (CO5)	Improve general and academic listening skills



## IV SEMESTER

### MA8391- PROBABILITY AND STATISTICS

Course Code	Course Outcomes
C210.1 (CO1)	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C210.2 (CO2)	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
C210.3 (CO3)	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C210.4 (CO4)	Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.
C210.5 (CO5)	Have the notion of sampling distributions and statistical techniques used in engineering and management problems.

### CS8491- COMPUTER ARCHITECTURE

Course Code	Course Outcomes
C211.1 (CO1)	Understand the basics structure of computers, operations and instructions.
C211.2 (CO2)	Design arithmetic and logic unit.
C211.3 (CO3)	Understand pipelined execution and design control unit.
C211.4 (CO4)	Understand parallel processing architectures
C211.5 (CO5)	Understand the various memory systems and I/O communication

### CS8492 DATABASE MANAGEMENT SYSTEMS

Course Code	Course Outcomes
C212.1 (CO1)	Classify the modern and futuristic database applications based on size and complexity
C212.2 (CO2)	Map ER model to Relational model to perform database design effectively
C212.3 (CO3)	Write queries using normalization criteria and optimize queries
C212.4 (CO4)	Compare and contrast various indexing strategies in different database systems
C212.5 (CO5)	Appraise how advanced databases differ from traditional databases



## CS8451 DESIGN AND ANALYSIS OF ALGORITHMS

Course Code	Course Outcomes
C213.1 (CO1)	Design algorithms for various computing problems.
C213.2 (CO2)	Analyze the time and space complexity of algorithms
C213.3 (CO3)	Critically analyze the different algorithm design techniques for a given problem.
C213.4 (CO4)	Modify existing algorithms to improve efficiency.
C213.5 (CO5)	Apply algorithmic techniques to solve real world problems.

## CS8493 OPERATING SYSTEM

Course Code	Course Outcomes
C214.1 (CO1)	Analyze various scheduling algorithms.
C214.2 (CO2)	Understand deadlock, prevention and avoidance algorithms.
C214.3 (CO3)	Compare and contrast various memory management schemes.
C214.4 (CO4)	Perform administrative tasks on Linux Servers.
C214.5 (CO5)	Understand the functionality of file systems.

## GE8291- ENVIRONMENTAL SCIENCE AND ENGINEERING

Course Code	Course Outcomes
C215.1 (CO1)	Interpret the relationship between living organisms and the environment and to identify the threats to global Bio-diversity
C215.2 (CO2)	Identify and prevent the problems related to the pollution of air, water, soil ,marine etc
C215.3 (CO3)	Understand the importance of natural resources and conserve it for future generation.
C215.4 (CO4)	Analyze the social issues of the environment to be a part of sustainable development.
C215.5 (CO5)	Create awareness and sustainable population growth and know the contribution of information technology un environmental management.



## CS8481 DATABASE MANAGEMENT SYSTEMS LABORATORY

Course Code	Course Outcomes
C216.1 (CO1)	Use typical data definitions and manipulation commands.
C216.2 (CO2)	Design applications to test Nested and Join Queries
C216.3 (CO3)	Implement simple applications that use Views
C216.4 (CO4)	Implement applications that require a Front-end Tool
C216.5 (CO5)	Critically analyze the use of Tables, Views, Functions and Procedures

## CS8461 OPERATING SYSTEMS LABORATORY

Course Code	Course Outcomes
C217.1 (CO1)	Compare the performance of various CPU Scheduling Algorithms
C217.2 (CO2)	Implement Deadlock avoidance and Detection Algorithms
C217.3 (CO3)	Implement Semaphores
C217.4 (CO4)	Create processes and implement IPC
C217.5 (CO5)	Analyze the performance of the various Page Replacement Algorithms

## HS8461 ADVANCED READING AND WRITING

Course Code	Course Outcomes
C218.1 (CO1)	Write different types of essays.
C218.2 (CO2)	Write winning job applications
C218.3 (CO3)	Read and evaluate texts critically.
C218.4 (CO4)	Display critical thinking in various professional contexts.
C218.5 (CO5)	Develop students critical thinking skills.



## V SEM

### MA8551 ALGEBRA AND NUMBER THEORY

Course Code	Course Outcomes
C301.1 (CO1)	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.
C301.2 (CO2)	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied context
C301.3 (CO3)	Demonstrate accurate and efficient use of advanced algebraic techniques.
C301.4 (CO4)	Demonstrate their mastery by solving non - trivial problems related to the concepts, and by
C301.5 (CO5)	Proving simple theorems about the, statements proven by the text.

### CS8591 COMPUTER NETWORKS

Course Code	Course Outcomes
C302.1 (CO1)	Understand the basic layers and its functions in computer networks. .
C302.2 (CO2)	Evaluate the performance of a network
C302.3 (CO3)	Understand the basics of how data flows from one node to another
C302.4 (CO4)	Analyze and design routing algorithms.
C302.5 (CO5)	Design protocols for various functions in the network

### EC8691 MICROPROCESSORS AND MICROCONTROLLERS

Course Code	Course Outcomes
C303.1 (CO1)	Understand and execute programs based on 8086 microprocessor.
C303.2 (CO2)	Design Memory Interfacing circuits.
C303.3 (CO3)	Design and interface I/O circuits
C303.4 (CO4)	Design and implement 8051 microcontroller based systems
C303.5 (CO5)	Design electrical circuitry to the Microcontroller I/O ports in order to interface it to external devices and comparison the performance of different processors



## IT8501 WEB TECHNOLOGY

Course Code	Course Outcomes
C304.1 (CO1)	Design simple web pages using markup languages like HTML and XHTML.
C304.2 (CO2)	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
C304.3 (CO3)	Program server side web pages that have to process request from client side web pages.
C304.4 (CO4)	Represent web data using XML and develop web pages using JSP
C304.5 (CO5)	Understand various web services and how these web services interact

## CS 8494 SOFTWARE ENGINEERING

Course Code	Course Outcomes
C305.1 (CO1)	Identify the key activities in managing a software project and Compare different process models
C305.2 (CO2)	Concepts of requirements engineering and Analysis Modeling.
C305.3 (CO3)	Apply systematic procedure for software design and deployment
C305.4 (CO4)	Compare and contrast the various testing and maintenance.
C305.5 (CO5)	Manage project schedule, estimate project cost and effort required.

Course Code	Course Outcomes
C306.1 (CO1)	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
C306.2 (CO2)	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
C306.3 (CO3)	Explain the core issues of cloud computing such as resource management and security.
C306.4 (CO4)	Be able to install and use current cloud technologies.
C306.5 (CO5)	Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of clouds.



## EC8681 MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

Course Code	Course Outcomes
C307.1 (CO1)	Write ALP Programmes for fixed and Floating Point and Arithmetic
C307.2 (CO2)	operations Interface different I/Os with processor
C307.3 (CO3)	Generate waveforms using Microprocessors
C307.4 (CO4)	Execute Programs in 8051
C307.5 (CO5)	Explain the difference between simulator and Emulator

## CS8581 NETWORKS LABORATORY

Course Code	Course Outcomes
C308.1 (CO1)	Implement various protocols using TCP and UDP.
C308.2 (CO2)	Compare the performance of different transport layer protocols.
C308.3 (CO3)	Use simulation tools to analyze the performance of various network protocols
C308.4 (CO4)	Analyze various routing algorithms
C308.5 (CO5)	Implement error correction codes

## IT8511 WEB TECHNOLOGY LABORATORY

Course Code	Course Outcomes
C309.1 (CO1)	Design simple web pages using MARKUP LANGUAGE LIKE html &XHTML.
C309.2 (CO2)	Create dynamic web pages using DHTML & JS that is easy to navigate and use.
C309.3 (CO3)	Program server side web pages that have to process request from client side .
C309.4 (CO4)	Represent web data using XML and develop web pages using JSP.
C309.5 (CO5)	Understand various web services and how these web services interact.