Second Year Program in Information Technology

CI201 Engineering Mathematics-III

Course Objective

1. To develop logical understanding of the subject.
2. To create the ability to model, solve and interpret physical and engineering problems.
3. To provide an overview of functions of complex variable which helps in solving many engineering problems.

Course Outcomes : By the end of the course students will be able to

1. Interpret the mathematical results in physical and other forms.

2. Identify, formulate and solve the Linear Differential Equations.

3. Classify and solve the contour integration of complex functions.

CI202 DISCRETE MATHEMATICS

Course Objectives:
1. This course is a foundation for the development of more advanced mathematical concepts.
2. To use appropriate set, function, or relation models for analysis of practical examples and interpretation of the associated operations and terminology in context.
3. To formulate problems precisely, solve the problems, apply formal proof techniques, and explain their reasoning clearly.

Outcomes: By the end of the course students will be able to
1. Understand a number of substantive and diverse topics covered in this course.
2. Develop an important new skill, the ability to write a mathematical proof, which is an excellent training for writing good computer programs.

CI203 DATA STRUCTURES

Course Objectives:
1. To understand the fundamentals of data structures and data representations.
2. To define high level of abstraction of various linear and nonlinear data structures.
3. To study the representation, implementation and applications of linear and nonlinear data structures.

Outcomes: By the end of the course students will be able to
1. Choose the appropriate data structure for modeling a given problem.
2. Understand and implement various data structures along with their application.

CI204 DIGITAL SYSTEMS

Course Objectives:

1. This course covers all basic concepts required for the design of a digital system.
2. To provide the student working knowledge of different methods for logic representation, manipulation, and optimization, for both combinational and sequential logic.
3. To understand the basics of Verilog Hardware Description Language.

Outcomes: By the end of the course students will be able to
1. Understand several fundamental concepts that can be applied to a wide variety of digital design problems.
2. Apply knowledge of Hardware Description Language in designing.

CI205 ECONOMICS FOR ENGINEERS

Course Objectives:
1. To understand various aspects of engineering economics.
2. To evaluate systematically the cost and benefit associated with different projects.
3. To understand different methods of depreciation, taxes and cost analysis.

Outcomes : By the end of the course students will be able to
1. Understand various concepts of economics.
2. Economically plan for their own project.
3. Get accustomed to the tax structure prevalent in the Indian economy.

CI206 PROGRAMMING LAB – I

Course Objectives:
1. To provide a comprehensive study of the C programming language.
2. To identify problems that requires programmed solution.
3. To study, analyze and implement pointers, memory allocation, data handling through files and graphics in 'C'.

Outcomes: By the end of the course students will be able to
1. Write programs using advance concepts of C- language.
2. Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
3. Design graphics programs using C.

CI207 PROFESSIONAL COMMUNICATION SKILLS

Course Objectives:
1. To understand the concept, process and importance of Professional Communication.
2. To enable students to acquire English Speaking and Writing Skills.
3. To hone Presentation Skills.

Outcomes: By the end of the course students will be able to
1. Understand the concept, process and importance of Professional Communication
2. Acquire English Speaking and Writing Skills
3. Develop Presentation Skills

CI208 MICROPROCESSORS AND MICROCONTROLLERS

Course Objectives:
1. To learn the architecture and programming of Microprocessors and microcontroller.
2. To acquire the assembly language programming skills of 8086 and 8051.
3. To learn peripherals and their interfacing with Microprocessor and microcontroller.

Outcomes: By the end of the course students will be able to
1. Understand microprocessor, microcontroller and ARM architectures.
2. Write assembly language and C programs for microprocessors and microcontrollers.
3. Perform Hands-on with various interfaces: LCD, Keyboard, ADC, DAC, and other peripherals using 8051.

CI209 COMPUTER ALGORITHMS

Course Objectives:
1. To learn how to analyze an algorithm theoretically.
2. To study basic methods of problem solving and algorithms in modern computing.

Outcomes: By the end of the course students will be able to
1. Analyze any algorithms and able to calculate their theoretical complexity.
2. Understand the problem solving methods such as recurrences, dynamic programming and greedy method.
3. Understand Np-Hard and Np-complete concepts.

CI210 SYSTEM PROGRAMMING

Course Objectives:
1. To introduce student the fundamental model of the processing of high level language programs for execution on computer system.
2. To explain the basic operations that are performed from the time a computer is turned on until a user is able to execute programs.
3. To understand and implement Assembler, Loader, Linkers, Macros & Compilers.
4. To introduce students the process management and information management via different software tools.

Outcomes: By the end of the course students will be able to
1. Understand different components of system software.
2. Understand intermediate code generation in context of language designing.
3. Recognize operating system functions such as memory management as pertaining to run time storage management.

CI211 OBJECT ORIENTED PROGRAMMING WITH C++

Course Objectives:
1. To know different programming paradigms.
2. To study and understand the object oriented programming concepts and methodology.
3. To implement object oriented programming concepts in C++.

Outcomes: By the end of the course students will be able to
1. Understand key features of the object-oriented programming language such as encapsulation (abstraction), inheritance, and polymorphism.
2. Design and implement object-oriented applications.
3. Analyze problems and implement simple C++ applications using an object-oriented software engineering approach.

CI212 NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING

Course Objectives:
1. To learn the techniques for finding the solutions numerically, with reliable and specified accuracy.
2. To introduce students to the mostly used numerical methods in the different engineering fields.
3. To apply numerical methods and probability distribution to obtain approximate solutions to mathematical problems.

Outcomes : At the end of this course, the students will be able to
1. Understand the mathematical background for the different numerical methods and probability distributions introduced in the course.
2. Learn the different numerical methods to solve the algebraic equations and to solve system of
linear and non linear equations.
3. Understand the different numerical methods for interpolation, differentiation, integration and
solving set of ordinary differential equations.

CI 213 PROGRAMMING LAB-II

Course Objectives
To study and implement programming assignments of the subject System Programming and
Computer Algorithm using gcc compiler in UNIX/LINUX environment.

Third Year Program in Information Technology

IT301: OPERATING SYSTEMS

Course Objectives:

1. To understand the basics of computer architecture and operating system.
2. To study resource management activities operating system.
3. To acquire knowledge about OS design issues.
4. To learn and understand operating system policies and mechanisms.

Outcomes:

After completion of this course the student will be able to:

1. Describe the general architecture of computers.
2. Describe process management, scheduling and synchronizations.
3. Understand and analyze theory and implementation of processes, memory management, physical and virtual memory, scheduling, file management and security.

IT302: AUTOMATA THEORY

Course Objectives:

1. To understand the concepts of Finite Automata.
2. Students should be able to design Turing machine.
3. Students should be able to design and analyze finite state machine.

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

1. Understand the concepts of automata, formal grammars and languages.
2. Identify the capabilities and limitations of computing machine.
3. Model various kinds of real-time problems.

IT303: DATABASE MANAGEMENT SYSTEMS

Course Objectives:

1. To understand the different issues involved in the design and implementation of a database system.

2. To study the physical and logical database designs, database modeling, and relational models.
3. To understand and use SQL to query, update, and manage a database.
4. To develop an understanding of essential DBMS concepts such as: transaction processing,
integrity, concurrency, and recovery in databases.
5. To design and build a simple database system and demonstrate competence with the fundamental
tasks involved with modeling, designing, and implementing a DBMS.

Course Outcomes:

1. Demonstrate an understanding of the relational data model.
2. Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
3. Formulate, using relational algebra, solutions to a broad range of query problems.
4. Formulate, using SQL, solutions to a broad range of query and data update problems.

IT 304: DATA COMMUNICATION & NETWORKS

Course Objectives:

1. To study about the concepts of Data communication and different transmission media.
2. To know about Error detection and Correction codes and understand about Network architecture & reference model.
3. To study and understand Physical & Data link layer (DLL) and multiple access & IEEE 802.3 (Ethernet/Wired LAN).
4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

Outcomes:

After completion of this course the student must demonstrate the knowledge and ability to:

4. Independently understand basic computer networks technology and understand the concepts data communications system and its components.
5. Explain Transmission media signal modulation techniques and enumerate the layers of the OSI model and TCP/I.
6. Understand Error Detection & Correction codes and multiple access & IEEE 802.3.

IT305: ELECTIVE-I: JAVA PROGRAMMING

Course Objectives:

1. To understand object oriented features of java and implementing it in java programming.
2. To learn and understand inheritance, interfaces, multithreading and exception handling.
3. To understand different input/output objects (input vs. output, character vs. byte, data vs. processing, object) and methods and the structure of the java.io package.
4. To learn and understand the use of applets and file handling.

Outcomes:

1. Student should know the model of object oriented programming and fundamental features of an object oriented language.
2. Student should know how to test, document and prepare a professional looking package
   for each business project.
3. Student have the ability to write a computer program to solve specified problems and to use the Java SDK environment to create, debug and run simple Java programs.
4. Student will be able to explain and develop programs for inheritance, multithreading, applets, exception handling and file handling.

IT306: ELECTIVE-I: DIGITAL SIGNAL PROCESSING

Course Objectives:

1. To study about the concepts of Digital signals and systems.
2. To understand Frequency Domain of LTI systems.
3. To understand Digital Filter Structures and Digital Filter Design.

Outcomes:

After completion of this course the student must be able to:

1. Describe the basic concepts of digital signals and systems.
2. Understand Frequency Domain Analysis of LTI Systems and Digital Filter Structures and digital filter design.
3. Formulate engineering problems in terms of DSP tasks and apply engineering problem solving strategies to DSP problems.
4. Design and test DSP algorithms and analyze digital and analog signals and systems.

IT307: ELECTIVE-I: INFORMATION THEORY AND CODING

Course Objectives:

1. To understand basic concepts of coding theory.
2. To learn about basic source coding and channel coding techniques.
3. To understand the concepts of entropy and information communication.

Outcomes:

After completion of this course the student will be able to:

1. Understand various source coding techniques.
2. Implement entropy and Mark-off statistical model.
3. Various error detecting codes.

IT308: WEB TECHNOLOGY LAB-I

Objectives:

1. To study designing the web pages.
2. To study formatting and validating web pages.
3. To study designing web sites and deploying web sites on web servers.

Outcomes:

Students will be able to

1. Design web pages.
2. Format and validate web pages.
3. Design web sites and deploy it on web servers.

IT309: SOFTWARE ENGINEERING

Course Objectives:

1. To introduce the students with basic principles of Software Engineering
2. To learn the Software Engineering concepts, methodologies and best practices
3. To train the students on Software Engineering principles and approach used in Industry.

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

1. Learn basic principles of Software Engineering.
2. Understand Software Engineering concepts, methodologies and best practices.
3. Learn Software Engineering principles and approach used in industry.

IT310: COMPILER DESIGN

Course Objectives:

1. To understand, design and implement various phases of compiler.
2. To extend the knowledge of parser by parsing LL parser and LR parser.
3. To understand optimization of codes and runtime environment.

Outcomes:

1. To acquire the knowledge of modern compiler & its features.
2. To learn & use the new tools and technologies used for designing a compiler.
3. To use the knowledge of patterns, tokens & regular expressions for solving a problem in the field of data mining.

IT311: COMPUTER NETWORKS

Course Objectives:

1. To understand the services offered by Network, Transport and Application Layers of TCP/IP.
2. To learn addressing schemes of TCP/IP protocol.
3. To study different protocols of TCP/IP model.
4. To learn to build TCP/IP based networks.
5. To familiarize with recent trends in networking and multimedia networking.

Course Outcomes:

1. Demonstrate an understanding of the TCP/IP model.
2. To be able to understand and configure IP addresses.
3. Should be able to do the analysis of data traffic on TCP/IP networks.
4. To be able to apply knowledge of TCP/IP in building LAN.

IT312: UNIX OPERATING SYSTEM

Course Objectives:

1. To understand the basic concepts, design and structure of the UNIX operating system.
2. To implement various system calls.
3. To acquire skills in UNIX Shell programming.
4. To learn basics of UNIX system administration.

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

1. Learn UNIX structure, commands, and utilities.

2. Describe and understand the UNIX file system.
3. Write shell scripts in order to perform shell programming.
4. Acquire knowledge about text processing utilities, process management and system operation of UNIX.

IT313: ELECTIVE-II PYTHON PROGRAMMING

Course Objectives:

1. To learn and understand Python programming basics and paradigm.
2. To learn and understand python looping, control statements and string manipulations.
3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
4. To learn and know the concepts of file handling, exception handling and database connectivity.

Outcomes:

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

1. Define and demonstrate the use of built-in data structures "lists" and "dictionary".
2. Design and implement a program to solve a real world problem.
3. Design and implement GUI application and how to handle exceptions and files.
4. Make database connectivity in python programming language.

IT314: ELECTIVE- II: ADVANCED DATABASE MANAGEMENT SYSTEMS

Course Objectives:

1. To understand the different issues involved in the design and implementation of a distributed and object oriented database systems.
2. To model database using UML.
3. To understand and use XML for designing database systems.
4. To familiarize with security concepts in databases.

Course Outcomes:

1. Demonstrate an understanding of the object oriented and distributed data models.
2. Create database systems using xml.
3. Demonstrate ability to prepare UML diagrams for information systems.
4. Formulate, using SQL, solutions to a broad range of query and data update problems.

IT314: ELECTIVE-II: ADVANCED DATABASE MANAGEMENT SYSTEMS LAB

Course Objectives:

1. To elaborate concepts of Processors and Memory Hierarchy.
2. To assess computer performance and understand I/O and properties of ISA.
3. To introduce enhancement of processing using pipelining.
4. To put some light on Advanced Architecture Concepts.

Outcomes:

1. To have understanding with clarity and completely, the nature and characteristics of modern-day computer organization
2. To gain knowledge for contemporary architectures like Intel's Core I-7, ARM and ATmega series

IT316: PROFESSIONAL APTITUDE AND LOGICAL REASONING

Course Objectives:

The students should

1. Develop a deep sense of analysis towards solving a problem
2. Supplement his/her problem solving skills
3. Develop critical thinking
4. Boost his/her ability to work with numbers
5. Augment a student's attention to detail
6. Enhance their spoken and written English Language

Outcomes: By the end of the course the student should be able to:

1. Identify, construct and compute numerical situations by work with numbers
2. Conceive and develop a methodology for analyzing and solving a problem
3. Analyze and interpret data
4. Develop and modify attention to detail
5. Define, modify and apply critical thinking to real time situations
6. Construct and design a structured approach to solving a given analytical situation

IT317. WEB TECHNOLOGY LAB-II

Course Objectives:

1. To design and deploy web application using servlets.
2. To design and deploy web application using JSPs.
3. To design and deploy web application using PHP.

Outcomes:

Students will be able to

1. Design and deploy web application using servlets.
2. Design and deploy web application using JSPs.
3. Design and deploy web application using PHP.

IT318: SEMINAR

Objectives

1. To develop soft skill.
2. To study and understand current trends in Information Technology and prepare presentation material.
3. To improve oral communication skills through presentation.
4. To prepare original technical write up on the presentation.

Outcomes

1. Improvement in proficiency in English
2. Improvement in presentation skill
3. Improvement in analytical and reasoning ability
4. Improvement in technical writing

Final Year Program in Information Technology

IT401: INFORMATION AND NETWORK SECURITY

Course Objectives:

1. To understand the principle of encryption algorithms, conventional and public key cryptography.
2. To have detailed knowledge about authentication, hash functions and application level security mechanisms.
3. To know the network security tools and applications and to understand the system level security used.

Outcomes:

After completion of this course the student will be able to:

1. Understand the principle of encryption algorithms; conventional and public key cryptography.
2. Have detailed knowledge about authentication, hash functions and application level security mechanisms.
3. Know the network security tools and applications and to understand the system level security used.

IT 402: DATA MINING & DATA WAREHOUSING

Course Objectives:

1. To introduce the basic concepts of Data Warehouse and Data Mining techniques.
2. To examine the types of the data to be mined and apply pre-processing methods on raw data.
3. To learn the designing of Data Warehousing schema for applications.
4. To discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.
5. To understand various tools of Data Mining and their techniques to solve the real time problems.
6. To develop ability to design various algorithms based on data mining tools.

Outcomes:

Students who complete this course should be able to

1. Design schema for real time data warehousing applications.
2. Process raw data to make it suitable for various data mining algorithms.
3. Discover and measure interesting patterns from different kinds of databases.
4. Apply the techniques of clustering, classification, association finding, feature selection and

visualization to real world data.
5. Use various data mining tools such as weka, etc.

IT 403. ELECTIVE III EMBEDDED SYSTEM

Course Objectives:
1. Understanding embedded system, processor & distributed embedded systems architecture.
2. The goal of this course is to learn ARM7TDMI processor and its internal functioning.
3. Provide an in-depth understanding of the system control and peripherals communication.
4. To get familiar with features of raspberry pi.

Outcomes:
1. Understand the embedded system with Processors and IC technologies.
2. Understand ARM7TDMI, its registers and their internal functions.
3. Good understanding and issues to be handled in using any processor, software tools chain
for embedded software solution development.
4. Understand interactive interface with pi and peripheral devices.
5. Understand peripherals with hands-on circuits and python programming.

IT 404. ELECTIVE-III DIGITAL IMAGE PROCESSING

Course Objectives:
The student should be made to:
1. Learn digital image fundamentals.
2. Be exposed to simple image processing techniques.
3. Be familiar with image compression and segmentation techniques.

Outcomes:
1. Discuss digital image fundamentals.
2. Apply image enhancement and restoration techniques.
3. Use image compression and segmentation Techniques.

IT 405. ELECTIVE-III PERL PROGRAMMING

Course Objectives:
This course is designed to provide
1. Basic introduction to programming using Perl.
2. Knowledge of CGI scripts.
3. Basic Object Oriented Concepts and database connectivity in Perl.

Outcomes:
After completion of this course students should be able to
1. Understand basics of Perl .
2. Understand list arrays and hash.
3. Understand modules.

4. Understand CGI scripts.
5. Understand database connectivity.

IT 406. ELECTIVE-III GREEN IT – PRINCIPLES AND PRACTICES

Course Objectives:
1. To understand what Green IT is and How it can help improve environmental Sustainability
2. To understand the principles and practices of Green IT.
3. To understand how Green IT is adopted or deployed in enterprises.

Outcomes :
1. Students will be able to create awareness among stakeholders and promote green agenda and green initiatives in their working environments leading to green movement.
2. This green movement will create new career opportunities for IT professionals, auditors and others with special skills such as energy efficiency, ethical IT assets disposal, carbon footprint estimation, reporting and development of green products, applications and services.

IT 407. ELECTIVE-IV SOFTWARE TESTING AND QUALITY ASSURANCE

Course Objective:
1. To improve understanding of software testing skills- it's purpose, nature, issues and constraints.
2. To learn various software testing techniques through case studies.
3. To understand the essential characteristics of various automation tools used for testing.

Outcomes:
1. Apply modern software testing processes in relation to software development and project
management.
2. Create test strategies and plans, design test cases, prioritize and execute them.
3. Manage incidents and risks within a project.

IT 408. ELECTIVE-IV UNIFIED MODELING LANGUAGE

Course Objectives:
1. To understand various concepts of Unified Modeling Language.
2. To learn and implement UML views, static views, design views etc.
3. To understand deployment view, model management views.

Outcomes: Students will be able to
1. Create models for software applications.
2. Use the different UML notations for designing software.

IT 409. ELECTIVE-IV MOBILE APPLICATION DEVELOPMENT

Course Objectives:
1. To introduce student with new technology for mobile application.
2. To design the GUI of application and connect with backend.
3. To use location based services, to develop android services and publish android apps.

Outcomes:
1. Understanding Android as new technology for developing mobile application.
2. Understanding design of GUI, database and provide connection.
3. Understanding android services and publishing the android application on market.

IT 410. ELECTIVE-IV MANAGEMENT INFORMATION SYSTEMS

Course Objectives:
1. To learn different types of information systems in an organization
2. To understand various MIS operating in functional areas of an organization and explain
its relationship with the various activities of the organization.
3. To know how MIS is developed and implemented for various levels in an organization.

Outcomes:
1. Understand information systems and their uses.
2. Use computerized management information systems.
3. In-depth analysis and decision making.
4. Aware of security issues related to information systems.

IT 412. INDUSTRIAL INTERNSHIP / CERTIFIED COURSE / TECHNICAL TRAINING

Course Objectives:
1. Gain practical experience of the corporate environment.
2. Apply knowledge and skills learned in the classroom to solve real life problems.
3. Understand career options in IT industry.
4. Learn professional and corporate behavior and ethics.
5. Enhance soft skills required for the industry.
6. Identify areas for future learning and skill development.
7. To learn project management skills.
8. To study the industry profile, background, Vision, Mission, Quality policy,
Product/service profile
9. Detailed study of various departments and the product life cycle.

IT 414. MOBILE COMMUNICATION

Course Objectives:
1. To understand the various terminology, principles, devices, schemes, concepts, generations, and different methodologies used in Mobile and Wireless Communication Networks.

2. To introduce the student to the major concepts involved in Wireless LAN (IEEE 802.11),
and Bluetooth.
3. To study the operation of basic cellular system and performance criterion, handoff mechanism, etc.
4. To expose students to emerging technologies and their potential impact.

Course Outcomes:
After completing this course, students will
1. Have the understanding of different generations, terminologies, systems, operations and
design of wireless and mobile communications.
2. Acquire sufficient knowledge about IEEE 802.11 and Bluetooth standards.
3. Be able appreciate the contribution of Mobile and Wireless Communication networks to
overall technological growth
4. Understand the concepts and technology involved in 3G, 4G and 5G Networks.

IT 415. INFORMATION TECHNOLOGY PROJECT MANAGEMENT

Course Objectives:
1. To get introduced to the IT project management needs and methodologies.
2. To be able to understand and learn managerial skills.
3. To have the detailed knowledge of implementation of IT project management.
Outcomes:
1. Understanding necessity of management.
2. Understanding the difference between management and leadership.
3. Understanding the steps of IT project management.

IT 416. ELECTIVE-V CLOUD COMPUTING

Course Objective:
This course will help the students to get familiar with
1. Cloud computing fundamentals and architecture.
2. Cloud computing services and implementation.
3. Cloud computing implementation and deployment techniques.

Outcomes:
After completion of the course the learner should be able to:
1. Differentiate different computing techniques.
2. Compare various cloud computing providers/ Software.
3. Understand risks involved in cloud computing.

IT 417. ELECTIVE-V DISTRIBUTED SYSTEM

Course Objectives:
1. This course provides an introduction to the fundamentals of distributed computing systems, assuming the availability of facilities for data transmission.

2. To learn the principles, architectures, algorithms and programming models used in distributed systems.
3. The structure of distributed systems using multiple levels of software is emphasized. Specific topics include: distributed algorithms, distributed file systems, distributed databases, security and protection distributed services such as the world-wide web.

Outcomes: By the end of the course students will be able to
1. Understand key features of the Distributed Systems such as Communications, Processes,
Synchronization, Fault Tolerance, Consistency and Replications.
2. Use and apply important methods in distributed systems to support scalability and fault
Tolerance.
3. Design and implement distributed applications of Distributed Systems.

IT 418. ELECTIVE-V INTERNET OF THINGS

Course Objectives:
1. To learn physical design, logical design and enabling technologies of internet of things.
2. To acquire knowledge about IoT platforms design methodology.
3. To learn about IoT physical servers and cloud offerings.
4. To study IoT case studies using python.

Course outcomes:
1. Understand principles, concepts, and technologies for internet of things.
2. Able to build physical and logical design of IoT systems.
3. Understand cloud platforms for IoT.

IT 419. ELECTIVE-V ADVANCED COMPUTER ARCHITECTURE

Course Objectives:
1. To provide a comprehensive knowledge of scalable and parallel computer architectures.
2. To understand how to achieve better performance with increased system resources.
3. To learn how system resources are scaled by the number of processors used, the memory
capacity enlarged, the access latency tolerated, the I/O bandwidth required, the performance
level desired.

Outcomes:
1. Understand different processor architectures and system-level design processes.
2. Understand the principles of I/O in computer systems, including viable mechanisms for
I/O and secondary storage organization.
3. Understand different processor architectures and system-level design processes

IT 420: ELECTIVE VI CYBER SECURITY

Course Objectives:
1. To make students familiar with the fundamental concepts of computer ethics.
2. To know the linkage between computer, professional, philosophical ethics and decision
making.
3. To develop the concepts in computer forensics.
4. To give emphasis on how cyber security operations are carried out.
5. To introduce the linkage between technology, law and ethics and IT Act.

Outcomes:
After completion of this course the student will be able to:
1. Understand the fundamental concepts of computer ethics.
2. Know the linkage between computers, professional, philosophical ethics and decision making.
3. Develop the concepts in computer forensics.
4. Understand how cyber security operations are carried out.
5. Understand the linkage between technology, law and ethics and IT Act.

IT 421: ELECTIVE VI E-COMMERCE

Course Objectives:
1. To understand various concepts of E-commerce and their types.
2. To learn and understand about client side, server side programming and database connectivity to do business on the web.
3. To provide security to different applications on the web.

Outcomes:
1. Design and implement an e-commerce application with a shopping cart..
2. Integrate user-centered design guidelines in developing user-friendly websites.
3. Analyze real business cases regarding their e-business strategies and transformation processes and choices.

IT 422: ELECTIVE VI WIRELESS SENSOR NETWORKS
Course Objectives:
1. To understand the concepts of sensor networks, study the architecture and applications of
WSN.
2. To discuss the challenges in designing MAC and routing protocols for wireless sensor networks.
3. To study Challenges of Security in Wireless Sensor Networks and Future trends for Security

Outcomes: Students will be able
1. To understand and study the functionalities, applications and architecture of WSN.
2. To describe the challenges in designing various protocols for wireless sensor networks.

3. To understand the current technology trends for the implementation and deployment of
wireless sensor networks.
4. To gain an understanding of WSN Standards and future trends in WSN.
5. To understand security aspects like Privacy issues, attacks and countermeasures

IT 423: ELECTIVE VI BIG DATA ANALYTICS

Course Objectives:
1. To familiarize with the basic concepts of big data.
2. To learn how big data helps in analysis of application data.
3. To learn concept of Hadoop, Map Reduce, NoSQL, MongoDB, Cassandra, Hive, and Pig.
4. Develop ability to analyze and process Big Data.
5. Build necessary skills to write Map Reduce programs for analyzing Big Data problems.

Outcomes: Student will be able
1. To identify need for Big Data analysis.
2. To understand concepts of Hadoop, MapReduce, NoSQL, MongoDB, Cassandra, Hive, and Pig
3. To analyze and identify Big data processing technology for analyzing the Big data.
4. To write Map Reduce programs to process Big Data by identifying the use case.

IT 424. WEB TECHNOLOGY LAB III

Course Objectives:
1. To learn programming in C# and dot NET framework.
2. To develop web applications using C# and dot NET framework.

Course Outcomes:
After completion of this course student should be able to
1. Design console application and windows application.
2. Design web application.