



Estd. 2004

## Lakshmi Narain College of Technology, Indore

Bhawrasala, Behind SAIMS Hospital, Sanwer Road, Indore, Madhya Pradesh, 453331

Phone: 0731-425 31 25 | +91 97 524 108 47

Email: admission@lncindore.com

### **Branch: Information Technology**

#### **Programme Educational Objectives (PEOs)**

**PEO 1. Core Knowledge** - Computer engineering graduates will have the knowledge of basic science and Engineering skills, Humanities, social science, management and conceptual and practical understanding of core computer engineering area with project development.

**PEO 2. Employment/ Continuing Education** - Computer engineering graduates will have the knowledge of Industry-based technical skills to succeed in entry level engineering position at various industries as well as in academics.

**PEO 3. Professional Competency** - Computer engineering graduates will have the ability to communicate effectively in English, to accumulate and disseminate the knowledge and to work effectively in a team with a sense of social awareness.

#### **Programme Outcomes (POs)**

Engineering Graduates will be able to:

**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of

the information to provide valid conclusions.

**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### **Programme Specific Outcomes (PSOs)**

Computer Engineering Graduates will be able to::

**Software Systems Development:** Apply the theoretical concepts of computer engineering and practical knowledge in analysis, design and development of software systems.

**Open Source Software:** Demonstrate familiarity and practical competence with a broad range of programming languages and open source platforms

**Computer Proficiency:** Exhibit proficiency through latest technologies in demonstrating the ability for work efficacy to the industry & society.

<b>Course Outcomes (COs)</b>	
NAME OF SUBJECT: Energy & Environmental Engineering	
SUBJECT CODE: ES301	
Students will be able to	
CO1:	Identify forms of energy & its transformation for sustainable environment.
CO2:	Apply principle of ecology to develop ecosystem for various topographical land.
CO3:	To apply principle of biodiversity at global and local level of conservation of insitu and exsitu of biodiversity.
CO4:	To identify the particulates in solid, liquid and gas waste management and its effect on environment.
CO5:	Student will solve environmental related problem.

NAME OF SUBJECT: Discrete Structure	
SUBJECT CODE: IT302	
Students will be able to	
CO1:	To understand the notion of mathematical thinking, and algorithmic thinking and be able to apply them in problem solving such as formal specification, Verification and basic concepts of set theory.
CO2:	Students understand the basic principle of Boolean algebra, logic and set theory.
CO3:	Be able to construct simple mathematical proof and possess the ability to verify them.
CO4:	To enable students to perform set operation and solve logical reasoning and verify the Correctness of logical statement.
CO5:	To apply the properties of relations and find partially ordered set and lattices.

NAME OF SUBJECT: Data Structure	
SUBJECT CODE: IT303	
Students will be able to	
CO1:	For a given search problem (linear search and binary search) student will be able to Implement it.
CO2:	For a given problem of stacks, queues and link lists, students will be able to implement it and analyze the same to determine the time and computation complexity
CO3:	Write an algorithm for selection sort, insertion sort, quick sort, merge sort, heap sort, bubble sort and compare their performance
CO4:	Implement tree, graph search and traversal algorithms.
CO5:	Implement algorithms for solving various problems using data structures.

NAME OF SUBJECT: Object Oriented Programming & Methodology	
SUBJECT CODE: IT304	
Students will be able to	
CO1:	Recognize attributes and methods for given objects.
CO2:	Define data types and also deal with operations applied for data structures.
CO3:	Implement algorithms and complex problems.
CO4:	Develop understanding of pointers and memory management.

CO5:	Develop understanding of file input/output and templates.
------	---

NAME OF SUBJECT: Digital Circuits and Systems	
SUBJECT CODE: IT305	
Students will be able to	
CO1:	Perform number base conversions, use Boolean logic to create digital Circuits.
CO2:	Understand use of encoders, decoders, multiplexers and demultiplexers in communication systems.
CO3:	By learning design of combinational and sequential circuits student can understand its use in digital systems such as computers, communication systems and other modern technologies.
CO4:	Study of ADC and DAC along with display devices will enable students to understand signal conversion and its display and their applications in digital devices.
CO5:	Implement various logic families.

NAME OF SUBJECT: Java Programming Lab	
SUBJECT CODE: IT306	
Students will be able to	
CO1:	The concepts of Java programming
CO2:	The basic terminology used in computer programming and write, compile and debug programs in JAVA language.
CO3:	The different data types, decision structures, loops, functions to design Java programs.
CO4:	Develop program using the java collection API as well as the java standard class library.
CO5:	Develop Java applets.

NAME OF SUBJECT: Mathematics-III	
SUBJECT CODE: BT401	
Students will be able to	
CO1:	Acquire the basic knowledge of solution of polynomial and transcendental equations.
CO2:	Analyze numerical differentiation & integration to solve engineering problems.
CO3:	Determine ordinary differential equations for solving technical problems.
CO4:	Apply transform calculus to solve engineering problems.
CO5:	Describe concept of probability to solve the problems.

NAME OF SUBJECT: Computer Architecture	
SUBJECT CODE: IT402	
Students will be able to	
CO1:	Understand basic structure of computer system, arithmetic operations.
CO2:	Understand the arithmetic operations, Study of hardwired and micro-programmed control units.
CO3:	Develop the concepts of memory management, interleaving and mapping.
CO4:	Analyze the arithmetic and instructional pipelines.
CO5:	To study the different ways of communicating with I/O devices and standard I/O interfaces,

hierarchical memory system including cache memories and virtual memory.
---

NAME OF SUBJECT: Analysis and Design of Algorithm	
SUBJECT CODE: IT403	
Students will be able to	
CO1:	Implement sorting and searching algorithm
CO2:	Experiment with techniques for obtaining maximum output with minimum efforts
CO3:	Make use of dynamic programming for finding
CO4:	Solve 8 queen's problem and others of the kind for application in real world scenarios .
CO5:	Distinguish between NP hard and NP complete problems and develop their solutions

NAME OF SUBJECT: Analog & Digital Comm.	
SUBJECT CODE: IT404	
Students will be able to	
CO1:	Differentiate Analog and Digital Signal and types of signals.
CO2:	Understand the communication of information over the communication channel.
CO3:	Understand how information signal of low frequency can be transmitted with the help of modulation techniques over a long distance.
CO4:	Differentiate different modulation techniques such as AM, SSB, DSB and FM.
CO5:	Explain using block diagrams, modulation and demodulation techniques for digital signal.

NAME OF SUBJECT: Data Base Management System	
SUBJECT CODE: IT405	
Students will be able to	
CO1:	Compare file system and DBMS and explain how DBMS is better than traditional File Processing Systems.
CO2:	Analyze the physical and logical database designs, database modeling, relational, hierarchical, and network models
CO3:	Analyze and renovate an information model into a relational database schema and to use a DDL, DML and DCL utilities to implement the schema using a DBMS.
CO4:	Formulate data retrieval queries in SQL and Relational Algebra.
CO5:	Demonstrate an understanding of functional dependencies, normalization theory and apply such knowledge to the design of a database.
CO6:	Demonstrate and explain terms like Transaction Processing, Concurrency Control, distributed database and big data.

NAME OF SUBJECT: Introduction to MATLAB/SciLab/Web Design	
SUBJECT CODE: IT406	
Students will be able to	
CO1:	To familiarize students with open source academic software like Scilab or licensed software like Matlab.
CO2:	To carryout experiments in various fields in due course like computer graphics and multimedia, soft-computing, image processing, data mining etc.

CO3:	Experimental works in web design.
CO4:	To design web pages and develop web based projects.
CO5:	Implement any type of project using MATLAB or Scilab.

NAME OF SUBJECT: Open Source Software Lab (Linux and R)	
SUBJECT CODE: IT407	
Students will be able to	
CO1:	Understand the basic commands used in Linux operating system
CO2:	Learn the important Linux/UNIX library functions and system calls
CO3:	Write, compile and debug shell script in Linux environment
CO4:	Learn how to program in R and write R functions
CO5:	Read data into R, access R packages

NAME OF SUBJECT: Operating System	
SUBJECT CODE: IT501	
Students will be able to	
CO1:	Gain knowledge of history of operating systems
CO2:	Understand design issues associated with operating systems
CO3:	Gain knowledge of various process management concepts including scheduling, synchronization, and deadlocks.
CO4:	Understand concepts of memory management including virtual memory.
CO5:	Understand issues related to file system interface and implementation, disk management.
CO6:	Be familiar with protection and security mechanisms.
CO7:	Be familiar with various types of operating systems including Unix.

NAME OF SUBJECT: Computer Networks	
SUBJECT CODE: IT502	
Students will be able to	
CO1:	Have a good understanding of the OSI Reference Model and its Layers
CO2:	Identify core networking and infrastructure components and the roles they serve; and given requirements and constraints, design and IT infrastructure including devices, topologies, protocols, systems software, management and security.
CO3:	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
CO4:	Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols.
CO5:	To experience the designing and managing of communication protocols while getting a good exposure to the TCP/IP protocol suite.

NAME OF SUBJECT: Theory of Computation	
SUBJECT CODE: IT503 (A)	
Students will be able to	
CO1:	Have a good understanding of the OSI Reference Model and its Layers
CO2:	Identify core networking and infrastructure components and the roles they serve; and given requirements and constraints, design and IT infrastructure including devices, topologies, protocols, systems software, management and security.
CO3:	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
CO4:	Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols.
CO5:	To experience the designing and managing of communication protocols while getting a good exposure to the TCP/IP protocol suite.

NAME OF SUBJECT: Theory of Computation	
SUBJECT CODE: IT503 (A)	
Students will be able to	
CO1:	Convert between finite automata, regular grammars, and regular expression representations of regular languages.
CO2:	Apply the pumping lemma for regular languages to determine if a language is regular.
CO3:	Convert between grammars and push-down automata for context-free languages.
CO4:	Determine if a language is regular or context-free.
CO5:	Demonstrate that a grammar is ambiguous.
CO6:	Translate a context-free grammar from one form to another.
CO7:	Produce simple programs for a Turing Machine.
CO8:	Explain the concept of undecidability.
CO9:	List examples of undecidable problems.

NAME OF SUBJECT: Microprocessor and Interfacing	
SUBJECT CODE: IT503 (B)	
Students will be able to	
CO1:	Explain the microprocessor's and Microcontroller's internal architecture.
CO2:	Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller.
CO3:	Compare accepted standards and guidelines to select appropriate Microprocessor (8085&8086) and Microcontroller to meet specified performance requirements.
CO4:	Analyze assembly language programs.
CO5:	Design electrical circuitry to the Microprocessor I/O ports in order to interface the process or to external devices.
CO6:	Evaluate assembly language programs.

NAME OF SUBJECT: Object Oriented Analysis and Design	
SUBJECT CODE: IT503 (C)	
Students will be able to	
CO1:	Explain OOAD concepts.
CO2:	Perform object oriented analysis and develop static model of system after identifying classes and their relationships.
CO3:	Develop dynamic model of system by identifying states and events.
CO4:	Develop interaction model of system by drawing use case, sequence and activity diagrams.
CO5:	Select an appropriate design pattern and effectively construct object-oriented programs.

NAME OF SUBJECT: Artificial Intelligence	
SUBJECT CODE: IT504 (A)	
Students will be able to	
CO1:	Be familiar with terminology used in this area
CO2:	Explain what constitutes "Artificial" Intelligence and how to identify systems with Artificial Intelligence.
CO3:	Know how to build simple knowledge-based systems.
CO4:	Have ability to apply knowledge representation, reasoning, and machine learning techniques to real world problems.

NAME OF SUBJECT: E Commerce & Governance	
SUBJECT CODE: IT504 (B)	
Students will be able to	
CO1:	Understand the e-business concepts.
CO2:	Understand the e-business models and infrastructure.
CO3:	Learn how e-business concepts are applied to different fields, such as: education, banking, tourism and so on.
CO4:	Will come up with online business ideas and will be motivated to apply what they learned.

NAME OF SUBJECT: Java Programming	
SUBJECT CODE: IT504 (C)	
Students will be able to	
CO1:	Have the knowledge of the structure and model of the Java programming language.
CO2:	Use the Java programming language for various programming tasks.
CO3:	Develop software in the Java programming language.
CO4:	Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements.
CO5:	Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem.



NAME OF SUBJECT: Advanced Java Lab	
SUBJECT CODE: IT505	
Students will be able to	
CO1:	Learn to access database through Java programs, using Java Data Base Connectivity (JDBC).
CO2:	Create dynamic web pages, using Servlets and JSP.
CO3:	Make a reusable software component, using Java Bean.
CO4:	Invoke the remote methods in an application using Remote Method Invocation (RMI)
CO5:	Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).
CO6:	Develop Stateful, Stateless and Entity Beans.
CO7:	Use Struts frameworks, which give the opportunity to reuse the codes for quick development.

NAME OF SUBJECT: Computer Graphics & Multimedia	
SUBJECT CODE: IT601	
Students will be able to	
CO1:	Understand the core concepts of computer graphics.
CO2:	Implement various shapes drawing algorithms.
CO3:	Apply geometric transformations on graphic objects and also implement clipping, shading and color models.
CO4:	Understand multimedia systems architecture, multimedia components and use various Multimedia tools.
CO5:	Perform activities involved in design, development and testing of modeling, rendering, Shading and animation.

NAME OF SUBJECT: Wireless and Mobile Computing	
SUBJECT CODE: IT602	
Students will be able to	
CO1:	Explain the basic concepts of wireless network and wireless generations.
CO2:	Demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc
CO3:	Explain the design considerations for deploying the wireless network infrastructure.
CO4:	Appraise the importance of Adhoc networks such as MANET and Wireless Sensor networks
CO5:	Differentiate and support the security measures, standards. Services and layer wise security considerations.

NAME OF SUBJECT: Compiler Design	
SUBJECT CODE: IT603 (A)	
Students will be able to	
CO1:	Demonstrate an understanding of the compilation phases.
CO2:	Specify and analyze the lexical, syntactic and semantic structures of advanced language features.
CO3:	Write a scanner, parser, and semantic analyzer without the aid of automatic generators.
CO4:	Describe techniques for intermediate code and machine code optimization.
CO5:	Design the structures and support required for compiling advanced language features.

NAME OF SUBJECT: Data Mining	
SUBJECT CODE: IT603 (B)	
Students will be able to	
CO1:	Demonstrate an understanding of the importance of data warehousing and OLAP Technology.
CO2:	Organize and Prepare the data needed for data mining using pre preprocessing techniques
CO3:	Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on various data sets.
CO4:	Define and apply metrics to measure the performance of various data mining algorithms.
CO5:	Demonstrate an understanding of data mining on various types of data like web data and spatial data.

NAME OF SUBJECT: Embedded Systems	
SUBJECT CODE: IT603 (C)	
Students will be able to	
CO1:	Explain the embedded system concepts and architecture of embedded systems
CO2:	Describe the architecture of 8051 microcontroller and write embedded program for 8051 microcontroller
CO3:	Select elements for an embedded systems tool.
CO4:	Understand the memory types used in embedded systems.
CO5:	Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

NAME OF SUBJECT: Intellectual Property Rights	
SUBJECT CODE: IT604 (A)	
Students will be able to	
CO1:	Understand Primary forms of IPR
CO2:	Assess and critique some basic theoretical justification for major forms of IP Protection
CO3:	Compare and contrast the different forms of IPR in terms of key differences and similarities.
CO4:	Understand the registration procedures related to IPR.
CO5:	Have exposure to contemporary issues and enforcement policies in IPR.

NAME OF SUBJECT: Software Engineering	
SUBJECT CODE: IT604 (B)	
Students will be able to	
CO1:	Define various software application domains and remember different process model used in software development.
CO2:	Understand various measures of software and Generate project schedule.
CO3:	Describe functional and non-functional requirements of software and develop design models of software.
CO4:	Investigate the reason for bugs and apply the software testing techniques in commercial environment.
CO5:	Understand various activities to be performed for improving software quality and software

	maintenance.
--	--------------

NAME OF SUBJECT: Wireless Sensor Networks	
SUBJECT CODE: IT604 (C)	
Students will be able to	
CO1:	Have knowledge of some existing applications of wireless sensor actuator networks.
CO2:	Learn the various hardware, software platforms that exist for sensor networks.
CO3:	Have knowledge of the various protocols for sensor networks.
CO4:	Analyze modeling and simulation of sensor networks.
CO5:	Understand what research problems sensor networks pose in disciplines such as signal processing, wireless communications and even control systems.

NAME OF SUBJECT: Programming in Python	
SUBJECT CODE: IT605	
Students will be able to	
CO1:	Install Python and have knowledge of syntax of Python.
CO2:	Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
CO3:	Express different Decision Making statements and Functions.
CO4:	Develop code in Python using functions, loops etc.
CO5:	Design GUI Applications in Python and evaluate different database operations.

NAME OF SUBJECT: Android Programming	
SUBJECT CODE: IT606	
Students will be able to	
CO1:	Experiment on Integrated Development Environment for Android Application Development.
CO2:	Design and Implement User Interfaces and Layouts of Android App.
CO3:	Use Intents for activity and broadcasting data in Android App.
CO4:	Design and Implement Database Application and Content Providers.
CO5:	Experiment with Camera and Location Based service and develop Android App with Security features.

NAME OF SUBJECT: Soft Computing	
SUBJECT CODE: IT701	
Students will be able to	
CO1:	Understand concept of ANN and explain the XOR problem.
CO2:	Use supervised neural networks to classify given inputs.
CO3:	Understand unsupervised neural networks for clustering data.
CO4:	Build Fuzzy inference system using concepts of fuzzy logic.
CO5:	Obtain an optimized solution to a given problem using genetic algorithm.

NAME OF SUBJECT: Data Science	
SUBJECT CODE: IT702 (A)	
Students will be able to	
CO1:	Demonstrate proficiency with statistical analysis of data.
CO2:	Build and assess data-based models.
CO3:	Execute statistical analyses with professional statistical software.
CO4:	Demonstrate skill in data management.
CO5:	Apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively.

NAME OF SUBJECT: Cloud Computing	
SUBJECT CODE: IT702 (B)	
Students will be able to	
CO1:	Explain the core concepts of the cloud computing paradigm.
CO2:	Demonstrate knowledge of virtualization.
CO3:	Explain the core issues of cloud computing such as security, privacy, and interoperability.
CO4:	Choose the appropriate technologies, algorithms, and approaches for the related issues.
CO5:	Identify problems, and explain, analyze, and evaluate various cloud computing solutions.

NAME OF SUBJECT: SIMULATION & MODELING	
SUBJECT CODE: IT702 (C)	
Students will be able to	
CO1:	Define, describe and apply basic concepts related to modeling, identification and simulation
CO2:	Classify various simulation models and give practical examples for each category.
CO3:	Demonstrate the ability to apply knowledge of probability and statistics for <i>simulation &amp; modeling</i> ,
CO4:	Generate and test random numbers and apply them to develop simulation models.
CO5:	Construct a model for a given set of data and motivate its validity.

NAME OF SUBJECT: Augmented and Virtual Reality	
SUBJECT CODE: IT702 (D)	
Students will be able to	
CO1:	Demonstrate knowledge of virtual reality and its applications
CO2:	To describe the importance of viewing and projections.
CO3:	Understand geometric modeling and Virtual environment.
CO4:	Explain about virtual reality hardware and software
CO5:	Develop Virtual Reality applications.

NAME OF SUBJECT: Cyber Laws and Forensics	
SUBJECT CODE: IT703 (A)	
Students will be able to	
CO1:	Become aware of various cyber crimes and cyber laws
CO2:	Underline the need of digital forensic and role of digital evidences

CO3:	Understand different types of digital evidences that can be presented to support investigations
CO4:	List the methods to generate legal evidence and supporting investigation reports
CO5:	Use various digital forensic tools

NAME OF SUBJECT: Internet of Things	
SUBJECT CODE: IT703 (B)	
Students will be able to	
CO1:	Understand Internet of Things and its hardware and software components
CO2:	Interface I/O devices, sensors & communication modules
CO3:	Analyze data from various sources in real-time and take necessary actions in an intelligent fashion
CO4:	Remotely monitor data and control devices
CO5:	Develop real life IoT based projects

NAME OF SUBJECT: Social Networks	
SUBJECT CODE: IT703 (C)	
Students will be able to	
CO1:	Understand the importance of social media and networks
CO2:	Have skills for analyzing social media and networking data
CO3:	Visualize social networks
CO4:	Create real-life case studies using social media data
CO5:	Plan and execute a small-scale network analysis project.

NAME OF SUBJECT: Digital Image Processing	
SUBJECT CODE: IT703 (D)	
Students will be able to	
CO1:	Explain basic concepts of image processing.
CO2:	Have knowledge of techniques employed for the enhancement of images
CO3:	Categorize image compression techniques
CO4:	Interpret image segmentation and representation techniques.
CO5:	Develop any image processing application

NAME OF SUBJECT: Cloud Computing Lab	
SUBJECT CODE: IT704	
Students will be able to	
CO1:	Configure various virtualization tools such as Virtual Box, VMware workstation.
CO2:	Design and deploy a web application in a PaaS environment.
CO3:	Learn how to simulate a cloud environment to implement new schedulers.
CO4:	Install and use a generic cloud environment that can be used as a private cloud.
CO5:	Manipulate large data sets in a parallel environment.

NAME OF SUBJECT: IoT Lab	
SUBJECT CODE: IT705	
Students will be able to	
CO1:	Have understanding of Arduino/Raspberry Pi
CO2:	Apply the skills learned by designing, building, and testing a microcontroller-based embedded system
CO3:	Publishing/Subscribing to connect, collect data, monitor and manage assets
CO4:	Remotely monitor data and control devices
CO5:	Perform experiments and mini projects on IoT

NAME OF SUBJECT: Major Project- I	
SUBJECT CODE: IT706	
Students will be able to	
CO1:	Solve real life problems by applying knowledge.
CO2:	Analyze alternative approaches, apply and use most appropriate one for feasible solution
CO3:	Write precise reports and technical documents in a nutshell.
CO4:	Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work, Inter-personal relationships, conflict management and leadership quality.

NAME OF SUBJECT: Information Security	
SUBJECT CODE: IT801	
Students will be able to	
CO1:	Understand key terms and concepts in information security and Cryptography and evaluate the cyber security needs of an organization.
CO2:	Acquire knowledge to secure computer systems, protect personal data, and secure computer networks in an organization
CO3:	Apply knowledge of various encryption algorithms and authentication mechanisms to secure information in computer systems and networks.
CO4:	Understand principles of web security to secure network by monitoring and analyzing the nature of attacks and design/develop security architecture for an organization.
CO5:	Design operational and strategic information security strategies and policies.

NAME OF SUBJECT: Machine Learning	
SUBJECT CODE: IT802 (A)	
Students will be able to	
CO1:	Recognize the characteristics of machine learning strategies.
CO2:	Apply various supervised learning methods to appropriate problems.
CO3:	Identify and integrate more than one technique to enhance the performance of learning.
CO4:	Create probabilistic and unsupervised learning models for handling unknown pattern.
CO5:	Analyze the co-occurrence of data to find interesting frequent patterns and Preprocess the data before applying to any real-world problem and can evaluate its performance

NAME OF SUBJECT: Natural Language Processing	
SUBJECT CODE: IT802 (B)	
Students will be able to	
CO1:	Identify and discuss the characteristics of different NLP techniques.
CO2:	Understand the fundamental mathematical models and algorithms in the field of NLP and apply these mathematical models and algorithms in applications in software design and implementation for NLP
CO3:	Understand the complexity of speech and the challenges facing speech engineers
CO4:	Understand approaches to syntax and semantics in NLP
CO5:	Understand approaches to discourse, generation, dialogue and summarization within NLP

NAME OF SUBJECT: Robotics	
SUBJECT CODE: IT802 (C)	
Students will be able to	
CO1:	Understand robot mechanism
CO2:	Perform kinematic and dynamic analyses with simulation
CO3:	Design control laws for a robot
CO4:	Integrate mechanical and electrical hardware for a real prototype of robotic device
CO5:	Select a robotic system for given application

NAME OF SUBJECT: Quantum Computing	
SUBJECT CODE: IT802 (D)	
Students will be able to	
CO1:	Understand major concepts in Quantum Computing
CO2:	Explain the working of a Quantum Computing program, its architecture and program model
CO3:	Develop quantum logic gate circuits
CO4:	Develop quantum algorithm
CO5:	Program quantum algorithm on major toolkits

NAME OF SUBJECT: Blockchain Technology	
SUBJECT CODE: IT803 (A)	
Students will be able to	
CO1:	Understand block chain technology
CO2:	Acquire knowledge of cryptocurrencies
CO3:	Develop block chain based solutions and write smart contract using Hyperledger Fabric and Ethereum frameworks
CO4:	Build and deploy block chain application for on premise and cloud based architecture
CO5:	Integrate ideas from various domains and implement them using block chain technology in different perspectives

NAME OF SUBJECT: Human Computer Interaction	
SUBJECT CODE: IT803 (B)	
Students will be able to	

CO1:	Enumerate the basic concepts of human, computer interactions
CO2:	Create the processes of human computer interaction life cycle
CO3:	Analyze and design the various interaction design models
CO4:	Apply the interface design standards/guidelines for evaluating the developed interactions
CO5:	Apply product usability evaluations and testing methods

NAME OF SUBJECT: Printing and Design	
SUBJECT CODE: IT803 (C)	
Students will be able to	
CO1:	Develop CAD models for 3D printing.
CO2:	Import and Export CAD data and generate .stl file.
CO3:	Select a specific material for the given application.
CO4:	Select a 3D printing process for an application.
CO5:	Produce a product using 3D Printing or Additive Manufacturing (AM).

NAME OF SUBJECT: Parallel Computing	
SUBJECT CODE: IT803 (D)	
Students will be able to	
CO1:	To develop an understanding of various basic concepts associated with parallel computing environments
CO2:	Understand, appreciate and apply parallel and distributed algorithms in problem solving
CO3:	Acquire skills to measure the performance of parallel and distributed programs
CO4:	Design parallel programs to enhance machine performance in parallel hardware environment
CO5:	Design and implement parallel programs in modern environments such as CUDA, OpenMP, etc

NAME OF SUBJECT: Major Project- II	
SUBJECT CODE: IT805	
Students will be able to	
CO1:	Show evidence of independent investigation
CO2:	Critically analyze the results and their interpretation.
CO3:	Report and present the original results in an orderly way and placing the open questions in the right perspective.
CO4:	Link techniques and results from literature as well as actual research and future research lines with the research.
CO5:	Appreciate practical implications and constraints of the specialist subject