COURSE OUTCOMES

Semester-III		
Subject with Code	**CO**	**Statement**
3IT1A: Electronics Devices & Circuits	**CO-1**	Basics of statics and dynamics of electronics and fundamental of diode and working.
	CO-2	Basics of low and high frequency analysis of transistors
	CO-3	Basic concepts of amplifiers with negative feedback amplifications and their analysis.
	CO-4	Basic knowledge of amplifiers with positive feedback, oscillators with their analysis.
3IT2A: Data Structures & Algorithms	**CO-1**	To identify the types of data structures, analyze an algorithm and determine their complexity.
	CO-2	To implement various searching and sorting techniques on linear data structures and be able to choose appropriate technique.
	CO-3	To implement various operations on non linear data structures such as linked lists, stacks, queues, trees and graphs to solve various computing problems.
	CO-4	To implement priority queue and B-trees.
3IT3A: Digital Electronics	**CO-1**	Explain numerical value in various Number Systems and perform number system conversions.
	CO-2	Know that how CMOS and MOS transistors can be used to realize digital logic circuits and deals with logic families.
	CO-3	Design day to day applications of CLS and SLC such as digital clock, calculator, and traffic light controller.
	CO-4	Identify, formulate and solve engineering problems in the area of digital circuits and digital systems.
3IT4A: Object Oriented Programming	**CO-1**	To review the concepts of procedural languages and differentiate between procedural and object oriented programming.
	CO-2	To identify the basic concepts and build the basic foundation of C++.
	CO-3	To identify higher level concepts like operator overloading, inheritance, templates and exception handling.
	CO-4	To design object oriented solutions for small systems involving multiple objects.
3IT5A: Linux and Shell Programming	**CO-1**	To describe and use the fundamental of LINUX operating system tools and utilities.
	CO-2	To working on different editors of LINUX and Desktop environments via CLI & GUI Modes.
	CO-3	To describe and write shell scripts in order to perform basic shell programming.
	CO-4	To describe and uses of the servers configuration.
3IT6A:Advanced Engineering Mathematics	**CO-1**	Solve the Linear, Non Linear and Transportation problems by the Optimization Techniques.
	CO-2	Define and understand the concept of divisibility, Congruence, Prime and Prime factorization. Understand the properties of the Group, Ring and Field.
	CO-3	Solve the Ordinary and Partial Differential equations by the help of Laplace Transform
	CO-4	Derive numerical methods for Interpolation, Numerical Differentiations and Integration and to solve Difference equation and Ordinary Differential equations.
	CO-1	To train the students the operational principle, analysis, design and application of the Diode, BJT, FET

3IT7A: Electronics Devices & Circuits Lab	**CO-2**	To train the students the operational principle, analysis, design and application of the Different type of Oscillators
	CO-3	To develop the students' ability on conducting engineering experiments, analyze experimental observations scientifically
	CO-4	
3IT8A: Data Structures Lab	**CO-1**	To implement various searching and sorting techniques on linear/non linear data structures to solve various computing problems.
	CO-2	To implement various operations on non linear data structures using linked lists.
	CO-3	To implement recursive/non recursive functions to perform various operations on data structures.
	CO-4	Able to design a suitable data structure and algorithm to solve a real world problem.
3IT9A:Digital Electronics Lab	**CO-1**	Explain numerical value in various Number Systems and perform number system conversions
	CO-2	Know that how CMOS and MOS transistors can be used to realize digital logic circuits and deals with logic families.
	CO-3	Design day to day applications of CLS and SLC such as digital clock, calculator, traffic light controller.
	CO-4	Identify, formulate and solve engineering problems in the area of digital circuits and digital systems.
3IT10A: Programming in C++ Lab	**CO-1**	Students will be able to understand the basics concepts of object oriented programming skills.
	CO-2	Students will be able to formulate the difference between Process Oriented and Object Oriented.
	CO-3	Students will be able to illustrate the characteristics of OOP- Data Hiding, Encapsulation, and Data Security.
	CO-4	Students will be able to evaluate the concept of classes, functions, Operator Overloading, Inheritance.
	CO-5	Students will also be able to design the syntax in order to program in C++.
3IT11A: Shell Programming Lab	**CO-1**	To describe and use the fundamental of LINUX operating system tools and utilities.
	CO-2	To working on different editors of LINUX and Desktop environments via CLI & GUI Modes.
	CO-3	To describe and write shell scripts in order to perform basic shell programming.
	CO-4	To describe and uses of the servers configuration.

Semester-IV		
Subject with Code	**CO**	**Statement**
4IT1A: Microprocessors & Interfaces	**CO-1**	To explain 8085 micro processor architecture and function of various pin and t-states and draw timing diagram for various instructions and also explain 8085 instruction set.
	CO-2	To Identify and write assembly language program for looping, stack and subroutine and to design of counters and time delay units.
	CO-3	To identify and impart the knowledge about various interfacing devices like 8279, 8259, 8237, 8255A PPI and 8253/8254 timer.
	CO-4	To identify the Microprocessor Application and Interface of peripheral ICS with 8085 and advanced topics in microprocessor
4IT2A: Discrete Mathematical Structures	**CO-1**	Understand the concept and operations of Sets, Functions and Relations.
	CO-2	Explain and construct proofs by certain methods.
	CO-3	Understand the concepts of graphs and trees and their use to visualize and simplify situations.

	CO-4	Understand the concepts of logics and their uses.
4IT3A: Statistics & Probability Theory	**CO-1**	Students will be able to understand the concepts of probability and its applications.
	CO-2	Students will be able to understand the concepts of curve fitting, correlation and regression.
	CO-3	Students will be able to understand the concepts of queuing theory and its applications in real world.
	CO-4	Students will be able to understand the concepts of Markov chain and its applications in real world.
4IT4A: Software Engineering	**CO-1**	To apply the theoretical concept of system analysis.
	CO-2	To know models of Software Development Life Cycle.
	CO-3	To identify system design methods and their implementations
	CO-4	To implement different models for OOA & OOD.
4IT5A: Principles of Communication	**CO-1**	The transmission of continuous signals in communication systems through Analog Modulation - Demodulation techniques.
	CO-2	Conversion of continuous analog signal to digital signal via sampling and transmission via Pulse Analog Modulation.
	CO-3	The transmission of digital signals in communication systems through digital modulation - demodulation.
	CO-4	Complete explanation of different types of waves and their transmission also able to analyze wire communication.
4IT6A: Principles of Programming Languages	**CO-1**	To identify the key paradigms used in developing modern programming languages.
	CO-2	To explore the implementation of each language in sufficient detail to provide the graduates with an understanding of the relationship between a source program and its execution behaviour.
	CO-3	To identify the design issues of object oriented and functional languages.
	CO-4	To identify the different programming languages syntax and semantics, which provide sufficient detail to demonstrate programs for real world applications.
4IT7A: Microprocessor Lab	**CO-1**	Understand 8085 microprocessor kit, knowledge of 8085 instruction set and train their practical knowledge through laboratory experiments.
	CO-2	Provide practical hands-on experience with microprocessor applications and interfacing techniques.
	CO-3	Design, code and debugs Assembly Language programs to implement simple programs and execute a machine code program on the training board.
	CO-4	Understand real world memory addressing and ability to interface various devices to the microprocessor.
4IT8A: Communication Lab	**CO-1**	Modulation and demodulation of analog and pulse analog carrier with sinusoidal signal
	CO-2	Observe the operation of digital modulation & demodulation of signal and consider reason for using digital signal transmissions of analog signals
	CO-3	Study & observe the amplitude response of automatic gain controller (AGC) and also calculate the attenuation constant in transmission line.
4IT9A: CASE Lab	**CO-1**	To apply the theoretical concept of system analysis.
	CO-2	To know models of Software Development Life Cycle.
	CO-3	To identify system design methods and their implementations
	CO-4	To implement different models for OOA & OOD.
4IT10A: Business Entrepreneurship	**CO-1**	To understand the importance of entrepreneurship as a tool for development, the basic principles of entrepreneurship and innovation.
	CO-2	To describe and distinguish the typologies of entrepreneurship, the financial sources for start-ups, the modes of business networking.

Development Lab	**CO-3**	To design business plans and develop capabilities and skills necessary to assume entrepreneurial activity
	CO-4	To implement theoretical knowledge acquired by designing a small virtual enterprise

Semester-V		
Subject with Code	**CO**	**Statement**
5IT1A: Computer Architecture	**CO-1**	To identify the computer architecture organization, fundamentals of different instruction set architectures and their relationship to CPU Designs.
	CO-2	To identify the operation of modern CPUs including pipelining, memory systems and buses.
	CO-3	To implement computer arithmetic methods to solve various computing problems and also able to identify the concept of memory organization.
	CO-4	To identify input output organization and Advanced Computer architecture concept.
5IT2A: Digital Signal Processing	**CO-1**	To distinguish between continuous-time and discrete-time signals, and to know the basic signals used in signal processing
	CO-2	To comprehend the concept of impulse response and to find the output of a system to any arbitrary input using convolution
	CO-3	To investigate systems in frequency domain using discrete time Fourier transform and its properties
	CO-4	To find IDTFT of signals using properties of FT and interpret LCCDE
5IT3A: Telecommunication Fundamentals	**CO-1**	To apply the elementary technical terminology of networking in field of communication.
	CO-2	To identify the methods how data flow is controlled over the network
	CO-3	To identify difference between the wired and wireless transmission state of art in real world.
	CO-4	To design and implement the switching, multiplexing concept and IP configuration of computer devices for data transmission and IP configuration of computer devices for data transmission.
5IT4A: Database Management Systems	**CO-1**	To identify the basic concepts of database management system and terminology used for the subject.
	CO-2	To apply sound design principles for logical design of databases, including the E-R modelling.
	CO-3	To apply the relational database theory as well as query processing and optimization.
	CO-4	To identify the schema refinement by normal forms and to apply the transaction processing and concurrency control.
5IT5A: OPERATING SYSTEMS	**CO-1**	To describe the general architecture of computer system and different states of process.
	CO-2	To acquire the detailed understanding of inter process communication, scheduling and CPU utilization.
	CO-3	To describe the concept of deadlock and memory management.
	CO-4	To acquire the knowledge of file system and disk scheduling.
5IT6.2A: E-Commerce	**CO-1**	To identify the architecture framework of e-commerce with basic terminologies
	CO-2	To identify the concept of WAP Technology in mobile commerce and various electronic payment modes
	CO-3	To identify various electronic payment modes and SET standard
	CO-4	To attain a knowledge about e-commerce related terminologies like VPN, SCM,EDI,CRM etc
	CO-1	To implement the basic DDL and DML commands and to define key constraints and integrity constraints.

5IT7A: Database Lab	**CO-2**	To implement functions, grouping, joins, nested queries and set operators.
	CO-3	To implement DCL and TCL query languages, create views and indexes.
	CO-4	To implement the simple PL/SQL named block: procedure, function, package and triggers.
5IT8A: Advanced Communication Lab	**CO-1**	Students would be able to understand the construction, operation ASK, FSK, PSK, QPSK and DPSK and analyze their different modulated and demodulated waveform.
	CO-2	Students would be able to understand and analyze modulated and demodulated waveform for Pulse code modulation (PCM) and also analyze time division multiplexing (TDM) technique.
	CO-3	Students would be able to measurement of losses and numerical aperture in optical fibre also measure and analyze different factor in microwave test bench.
	CO-4	Students would be able to understand and measure directivity and gain in different antennas also understand different characteristics of strip line directional coupler.
5IT9A: Operating System Simulation Lab	**CO-1**	To identify the basic concepts of Operating system.
	CO-2	To implement and simulate the various scheduling algorithms.
	CO-3	To implement and simulate the various Deadlock algorithms.
	CO-4	To implement and simulate the various memory management algorithms.
5IT10A: Digital Hardware Design Lab	**CO-1**	Students will understand the basic concepts of VHDL.
	CO-2	Students will acquire the ability to apply VHDL in modeling combinational and sequential circuits.
	CO-3	Students will be able to compile, simulate and synthesize the VHDL code.
	CO-4	To educate students with the knowledge of VHDL coding and test bench.

Semester-VI		
Subject with Code	**CO**	**Statement**
6IT1A: Computer Networks	**CO-1**	To describe Implementation of Computer Networks and the basic components of a Network system.
	CO-2	To identify the different types of Layers, Protocols, Protocol data units and network architecture.
	CO-3	To describe communication works in data networks and the Internet with security measures.
	CO-4	To describe Static and Dynamic routing via Packet tracer Network simulation tool.
6IT2A: Design and Analysis of Algorithms	**CO-1**	Students would be able to describe, apply and analyze the complexity of certain divide and conquer method, greedy method.
	CO-2	Students would be able to identify and analyze criteria and specifications appropriate to new problems of dynamic programming and branch and bound, pattern matching algorithms and assignment problem.
	CO-3	Students would be able to describe the Randomized algorithms, classes P, NP, and NP-Complete and be able to prove that a certain problem is NP-Complete.
	CO-4	To identify and analyze different types of tree (Red-black tree, B tree, B+ tree)
	CO-1	Identify machines by their power to recognize languages,
	CO-2	Identify finite state machines to solve problems in computing,

6IT3A: Theory of Computation	**CO-3**	Apply knowledge of theory of computation to solve various related problems
	CO-4	Design the hierarchy of problems arising in the computer sciences
6IT4A: Programming in Java	**CO-1**	To Identify java programming syntax, control structures & java programming concepts
	CO-2	To Identify the role of object oriented principles & general structures in building reusable code
	CO-3	30To Program using java concepts such as exception handling, overloading, file input/output etc
	CO-4	To attain a knowledge about concepts of applets, threads & graphics methods.
6IT5A: Information Theory & Coding	**CO-1**	To Apply the fundamental concepts of information theory viz. entropy, mutual information and channel capacity in communication system.
	CO-2	To Apply the principles of source coding and data transmission
	CO-3	To Analyze linear block code, cyclic code and Convolution code.
	CO-4	To Apply information theoretic methods to novel settings of encoding and decoding techniques.
6IT6.1A: Advance Topics in Operating System	**CO-1**	To identify concepts of operating system and the issues involved with them.
	CO-2	To study the different components of operating system and to know how kernel deals with them along with the security issues.
	CO-3	To identify the basics needed for designing, augmenting and configuring different OS (like Linux, Windows) to be suitable for a particular deployment.
	CO-4	To design, augment and configure; Multiprocessor OS, Multimedia OS and Mobile computing.
6IT7A: Java Programming Lab	**CO-1**	To Develop an in depth understanding of programming in Java.
	CO-2	To Implement object oriented programming concepts through applications.
	CO-3	To Develop applications using java concepts such as exception handling, packages, file input/output etc.
	CO-4	To Attain the knowledge of making applications and concepts of applets.
6IT8A: GUI Design Lab	**CO-1**	Students will acquire the ability to implement GDI Functions, CDC class and view class functions.
	CO-2	Students will be able to Implementing Dialog Block class, Completion Database Classes.
	CO-3	To educate students with the knowledge of creating new GUI and implement them in their project.
6IT9A: UML Lab	**CO-1**	Students will be able to learn document user requirement using UML notation.
	CO-2	Students will be able to provide description of the various components of UML.
	CO-3	Students will be able to understand use of Use Cases in developing software.
	CO-4	Students would be able to implement various searching and sorting techniques on linear/non linear data structures to solve various computing problems.
6IT10A: Design and Analysis of Algorithms Lab	**CO-1**	Students would be able to implement various searching and sorting techniques on linear/non linear data structures to solve various computing problems.
	CO-2	Students would be able to apply the algorithms and design techniques to solve problems
	CO-3	Students would be able to analyze the complexities of various problems in different domains.

6IT11A: Humanities and Social Sciences	**CO-1**	To demonstrate an in-depth knowledge of core substantive areas of society, important contemporary social problems
	CO-2	To acquire essential knowledge and skills in the ethical application.
	CO-3	To identify social problems using the sociological imagination, critically evaluate the effectiveness of interventions, and apply evidence to justify alternative strategies
	CO-4	To demonstrate the ability to conduct sociologically informed research projects progressing to the gathering and analysis of qualitative or quantitative data

Semester-VII		
Subject with Code	**CO**	**Statement**
7IT1A: Software Project Management	**CO-1**	Design the process to be followed in the software development life cycle and the basic concepts and issues of software project management.
	CO-2	To effectively Plan and estimate the software projects
	CO-3	To identify the project scheduling and quality planning basics.
	CO-4	Implement the review process and how the project monitoring and control is performed
7IT2A: Information System & Securities	**CO-1**	Identify and classify computer & security threats and apply various substitution and transposition techniques.
	CO-2	Apply mathematical techniques and codes for cryptography.
	CO-3	Compare & implement various signature generation & verification algorithms and digital data security.
	CO-4	Analyze the current IP security architecture & pursue his research in security field.
7IT3A: DATA MINING AND WAREHOUSING	**CO-1**	To identify the basic principles, concepts and applications of data warehousing, data mining and Knowledge discovery
	CO-2	To apply concept description on data including algorithms for the same
	CO-3	To design concepts of classification and prediction in terms of data mining
	CO-4	To identify Schemas and Logical architecture of data warehousing with different operations of OLAP and learn how to work with data mining tool
7IT4A: Internet Programming	**CO-1**	To implement the formatting concepts of web pages using XHTML, CSS etc.
	CO-2	To generate alerts and validations using Java Script.
	CO-3	To create dynamic content on web pages using Ajax.
	CO-4	To implement server side scripts like PHP, ASP.NET and attain the knowledge of making web pages and concept of session tracking.
7IT5A: Computer Graphics & Multimedia Techniques.	**CO-1**	To understand different input & output devices used in Computer Graphics.
	CO-2	To implement Computer Graphics fundamentals on different images & designs.
	CO-3	To understand scaling, rotation & translation on various images & designs.
	CO-4	To implement animation & simulation on images & designs.
7IT6.1: Advanced database management system	**CO-1**	To apply the theoretical concept of queries in any Database Management field.
	CO-2	To identify adequate knowledge of transactions and their execution in database.
	CO-3	To identify the difference between the deadlock and recovery of concurrent transactions

	CO-4	To implement how to make & secure the database and distributed Database and explore database by using extended queries in real world Problems.
7IT7A:Computer Graphics & Multimedia Lab	**CO-1**	. To apply the applications of Computer Graphics.
	CO-2	. To identify the methods how rotation translation & scaling applied.
	CO-3	To identify differences between object space & image space.
	CO-4	To design and implement animation programs.
7IT8A: DATA MINING AND WAREHOUSING LAB	**CO-1**	To identify the basic principles, concepts and applications of data warehousing, data mining and Knowledge discovery
	CO-2	To apply concept description on data including algorithms for the same
	CO-3	To design concepts of classification and prediction in terms of data mining
	CO-4	To identify Schemas and Logical architecture of data warehousing with different operations of OLAP and learn how to work with data mining tool
7IT9A: Internet Programming Lab	**CO-1**	To implement the formatting concepts of web pages using XHTML, CSS etc.
	CO-2	To generate alerts and validations using Java Script.
	CO-3	To create dynamic content on web pages using Ajax.
	CO-4	To implement server side scripts like PHP, ASP.NET and attain the knowledge of making web pages and concept of session tracking.
7ITPR: Project Stage-I	**CO-1**	Graduates will be able to understand the concepts of real world complex problems with analysing social impact for sustainable development in IT.
	CO-2	Graduates will be able to apply design, development and testing methodologies.
	CO-3	Graduates will be able to create cost effective solutions in multidisciplinary environments.
	CO-4	Graduates will be able to demonstrate their work with writing effective reports and design documentation via presentation tools.
7ITTR: Practical Training Seminar	**CO-1**	Graduate will be able to identify and analyze complex engineering problems through research methodology in Information Technology.
	CO-2	Graduate will be able to apply fundamental engineering knowledge to create and interpret data for socio-economic solutions using modern IT tools.
	CO-3	Graduate will be able to conduct investigations of complex problems using research-based knowledge to improve thinking, problem solving, and decision making.
	CO-4	Graduate will be able to develop communication skills, technical report writing, and professional ethics for life-long learning.

Semester-VIII		
Subject with Code	**CO**	**Statement**
8IT1A: SOFTWARE TESTING & VALIDATION	**CO-1**	The students understand the software testing process as how validation and verification can be done.
	CO-2	They shall be able to do various types of testing onto their projects.
	CO-3	The students can be able to specific problems related to object oriented system testing.
	CO-4	They will be able to manage (define, formulate and analyze) a project if any debug arises and can applied required testing procedures.
	CO-1	Will able to explain how to represent a digital image and the conversion process in digital form.

8IT2A: Digital Image Processing	**CO-2**	Will get the knowledge of basic image transformation and filtering process.
	CO-3	Will able to explain about degradation of image quality and compression techniques of images.
	CO-4	Will able to understand about various segmentation techniques and representation techniques of digital images
8IT3A: Data Compression Techniques	**CO-1**	To identify the fundamental concepts of Data Compression and Coding techniques.
	CO-2	To analyze the operation of a range of commonly used Coding and lossless Compression techniques
	CO-3	To analyze or apply the lossy compression and quantization on data
	CO-4	To Identify what new trends and what new possibilities of data compression are available.
8IT4.2A: MOBILE COMPUTING	**CO-1**	To identify the characteristics and limitations of mobile hardware devices including their user-interface modalities.
	CO-2	To develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.
	CO-3	TO comprehend and appreciate the design and development of context-aware solutions for mobile devices.
	CO-4	To identify professional and ethical issues, in particular those relating to security and privacy of user data and user behaviour.
8IT5A: Software Testing Lab	**CO-1**	Design and construct the manual test cases for different software module.
	CO-2	Construct the test cases in automation testing tool.
	CO-3	Record the test cases in different mode.
	CO-4	Design and construct the test cases for testing program using TSL.
8IT6A: Digital Image Processing Lab	**CO-1**	Implement and Execute digital image Acquisition and representation
	CO-2	Apply and analyze the methods to segment various types of images
	CO-3	Implement , analyze and compare various filters in images processing
	CO-4	Analyse and compare various algorithms used in image Compression
8IT7A:Advanced Web Programming Lab	**CO-1**	Design a basic web site using HTML and CSS to demonstrate responsive web design.
	CO-2	Implement dynamic web pages with validation using JavaScript objects by applying different event handling mechanism.
	CO-3	To develop programming skills in using client side and server side scripting languages using JSP.
	CO-4	Develop simple web application using server side PHP programming and Ajax Programming
8IT8A: Mobile Application Development Lab	**CO-1**	To Develop an in depth understanding of programming in Java2SME.
	CO-2	To implement thread concepts through applications.
	CO-3	To Create high level UI through working on drawing and images.
	CO-4	To Attain the knowledge of making applications and concepts of authentication with a web server.
8ITPR: Project Stage-II	**CO-1**	Graduates will be able to understand the concepts of real world complex problems with analysing social impact for sustainable development in IT.
	CO-2	Graduates will be able to apply design, development and testing methodologies.
	CO-3	Graduates will be able to create cost effective solutions in multidisciplinary environments.
	CO-4	Graduates will be able to demonstrate their work with writing effective reports and design documentation via presentation tools.
	CO-1	Graduate will be able to identify and analyze complex engineering problems through research methodology in Information Technology.

8ITSM: Seminar	**CO-2**	Graduate will be able to apply fundamental engineering knowledge to create and interpret data for socio-economic solutions using modern IT tools.
	CO-3	Graduate will be able to conduct investigations of complex problems using research-based knowledge to improve thinking, problem solving, and decision making.
	CO-4	Graduate will be able to develop communication skills, technical report writing, and professional ethics for life-long learning.