COMPUTER SCIENCE & ENGINEERING	
Course Code	**PROGRAMMING IN C AND DATA STRUCTURES - 17PCD13/23**
CO1	Learn basic principles of Problem solving
CO2	Implementing problems through C Programming Language
CO3	To design and Develop Programming skills
CO4	To gain knowledge of data structures and their applications
Course Code	**COMPUTER PROGRAMMING LABORATORY - 17CPL 16 / 17CPL26**
CO1	Gaining Knowledge on various parts of a computer.
CO2	Able to draw flowcharts and write algorithms
CO3	Able design and development of C problem solving skills.
CO4	Able design and develop modular programming skills.
CO5	Able to trace and debug a program
Course Code	**ANALOG AND DIGITAL ELECTRONICS -17CS32**
CO1	Explain the operation of JFETs and MOSFETs , Operational Amplifier circuits and their application
CO2	Explain Combinational Logic, Simplification Techniques using Karnaugh Maps, Quine McClusky technique.
CO3	Demonstrate Operation of Decoders, Encoders, Multiplexers, Adders and Subtractors, working of Latches, Flip-Flops, Designing Registers, Counters, A/D and D/A Converters
CO4	Design of Counters, Registers and A/D & D/A converters
Course Code	**DATA STRUCTURES AND APPLICATIONS - 17CS33**
CO1	Use different types of data structures, operations and algorithms
CO2	Apply searching and sorting operations on files
CO3	Use stack, Queue, Lists, Trees and Graphs in problem solving
CO4	Implement all data structures in a high-level language for problem solving.
Course Code	**COMPUTER ORGANIZATION -17CS34**
CO1	Explain the basic organization of a computer system.
CO2	Demonstrate functioning of different sub systems, such as processor, Input/output,and memory.
CO3	Illustrate hardwired control and micro programmed control. pipelining, embedded and other computing systems.
CO4	Design and analyse simple arithmetic and logical units.
Course Code	**UNIX SHELL PROGRAMMING - 17CS35**
CO1	Explain UNIX system and use different commands.
CO2	Write Shell scripts for certain functions on different subsystems.
CO3	Demonstrate use of editors and Perl script writing
Course Code	**ANALOG AND DIGITAL ELECTRONICS LABORATORY - 17CSL37**
CO1	Use various Electronic Devices like Cathode ray Oscilloscope, Signal generators, Digital trainer Kit, Multimeters and components like Resistors, Capacitors, Op amp and Integrated Circuit.
CO2	Design and demonstrate various combinational logic circuits.
CO3	Design and demonstrate various types of counters and Registers using Flip-flops
CO4	Use simulation package to design circuits.
CO5	Understand the working and implementation of ALU.

Course Code	**DATA STRUCTURES LABORATORY - 17CSL38**
CO1	Analyze and Compare various linear and non-linear data structures
CO2	Code, debug and demonstrate the working nature of different types of data structures and their applications
CO3	Implement, analyze and evaluate the searching and sorting algorithms
CO4	Choose the appropriate data structure for solving real world problems
Course Code	**SOFTWARE ENGINEERING - 15CS42**
CO1	Design a software system, component, or process to meet desired needs within realistic constraints.
CO2	Assess professional and ethical responsibility
CO3	Function on multi-disciplinary teams
CO4	Make use of techniques, skills, and modern engineering tools necessary for engineering practice
CO5	Comprehend software systems or parts of software systems.
Course Code	**DESIGN AND ANALYSIS OF ALGORITHMS - 15CS43**
CO1	Describe computational solution to well known problems like searching, sorting etc.
CO2	Estimate the computational complexity of different algorithms.
CO3	Devise an algorithm using appropriate design strategies for problem solving.
Course Code	**MICROPROCESSORS AND MICROCONTROLLERS - 15CS44**
CO1	Differentiate between microprocessors and microcontrollers
CO2	Design and develop assembly language code to solve problems
CO3	Gain the knowledge for interfacing various devices to x86 family and ARM processor
CO4	Demonstrate design of interrupt routines for interfacing devices
Course Code	**OBJECT ORIENTED CONCEPTS -15CS45**
CO1	Explain the object-oriented concepts and JAVA.
CO2	Develop computer programs to solve real world problems in Java.
CO3	Develop simple GUI int erfaces for a computer program to interact with users, and to **comprehend** the event-based GUI handling principles using Applets and swings.
CO4	
Course Code	**DATA COMMUNICATION - 15CS46**
CO1	Illustrate basic computer network technology.
CO2	Identify the different types of network topologies and protocols.
CO3	Enumerate the layers of the OSI model and TCP/IP functions of each layer.
CO4	Make out the different types of network devices and their functions within a network
CO5	Demonstrate the skills of subnetting and routing mechanisms
Course Code	**DESIGN AND ANALYSIS OF ALGORITHM LABORATORY - 15CSL47**
CO1	Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
CO2	Implement a variety of algorithms such assorting, graph related, combinatorial, etc., in a high level language.
CO3	Analyze and compare the performance of algorithms using language features.
CO4	Apply and implement learned algorithm design techniques and data structures to solve real world problems.

Course Code	**MICROPROCESSOR AND MICROCONTROLLER LABORATORY - 15CSL48**
CO1	Learn 80 x86 instruction sets and gins the knowledge of how assembly language works.
CO2	Design and implement programs written in 80x86 assembly language
CO3	Know functioning of hardware devices and interfacing them to x86 family
CO4	Choose processors for various kinds of applications
Course Code	**MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY - 15CS51**
CO1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
CO2	Utilize the resources available effectively through ERP
CO3	Make use of IPRs and institutional support in entrepreneurship
Course Code	**COMPUTER NETWORKS - 15CS52**
CO1	Explain principles of application layer protocols
CO2	Recognize transport layer services and infer UDP and TCP protocols
CO3	Classify routers, IP and Routing Algorithms in network layer
CO4	Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
CO5	Describe Multimedia Networking and Network Management
Course Code	**DATABASE MANAGEMENT SYSTEM - 15CS53**
CO1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
CO2	Use Structured Query Language (SQL) for database manipulation.
CO3	Design and build simple database systems
CO4	Develop application to interact with databases
Course Code	**AUTOMATA THEORY AND COMPUTABILITY-15CS54**
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
CO2	Learn how to translate between different models of Computation (e.g.,Deterministic and Non-deterministic and Software models).
CO3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
CO4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.
CO5	Classify a problem with respect to different models of Computation
Course Code	**DOT NET FRAMEWORK FOR APPLICATION DEVELOPMENT - 15CS564**
CO1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#
CO2	Demonstrate Object Oriented Programming concepts in C# programming language
CO3	Design custom interfaces for applications and leverage the available built-in interfaces in

	building complex applications.
CO4	Illustrate the use of generics and collections in C#
CO5	Compose queries to query in-memory data and define own operator behaviour.
Course Code	**COMPUTER NETWORK LABORATORY - 15CSL57**
CO1	Analyze and Compare various networking protocols.
CO2	Demonstrate the working of different concepts of networking.
CO3	Implement, analyze and evaluate networking protocols in NS2 / NS3
Course Code	**DBMS LABORATORY WITH MINI PROJECT - 15CSL58**
CO1	Create, Update and query on the database.
CO2	Demonstrate the working of different concepts of DBMS
CO3	Implement, analyze and evaluate the project developed for an application
Course Code	**CRYPTOGRAPHY, NETWORK SECURITY AND CYBER LAW - 15CS61**
CO1	Discuss cryptography and its need to various applications
CO2	Design and develop simple cryptography algorithms
CO3	Understand cyber security and need cyber Law
Course Code	**COMPUTER GRAPHICS AND VISUALIZATION - 15CS62**
CO1	Design and implement algorithms for 2D graphics primitives and attributes.
CO2	Illustrate Geometric transformations on both 2D and 3D objects.
CO3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
CO4	Decide suitable hardware and software for developing graphics packages using OpenGL
Course Code	**SYSTEM SOFTWARE AND COMPILER DESIGN - 15CS63**
CO1	Explain system software such as assemblers, loaders, linkers and macroprocessors
CO2	Design and develop lexical analyzers, parsers and code generators
CO3	Utilize lex and yacc tools for implementing different concepts of system software
Course Code	**OPERATING SYSTEMS 15CS64**
CO1	Demonstrate need for OS and different types of OS
CO2	Apply suitable techniques for management of different resources
CO3	Use processor, memory, storage and file system commands
CO4	Realize the different concepts of OS in platform of usage through case studies
Course Code	**OPERATIONS RESEARCH - 15CS653**
CO1	Select and apply optimization techniques for various problems.
CO2	Model the given problem as transportation and assignment problem and solve.
CO3	Apply game theory for decision support system.
Course Code	**MULTI-CORE ARCHITECTURE AND PROGRAMMING - 15CS666**
CO1	Identify the issues involved in multicore architectures
CO2	Explain fundamental concepts of parallel programming and its design issues

CO3	Solve the issues related to multiprocessing and suggest solutions
CO4	Point out the salient features of different multicore architectures and how they exploit paralllism
CO5	Illustrate Open MP and programming concept
Course Code	**SYSTEM SOFTWARE AND OPERATING SYSTEM LAB - 15CSL67**
CO1	Implement and demonstrate Lexer's and Parser's
CO2	Evaluate different algorithms required for management, scheduling, allocation and communication used in operating system.
Course Code	**COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT. 15CSL68**
CO1	Apply the concepts of computer graphics
CO2	Implement computer graphics applications using OpenGL
CO3	Animate real world problems using OpenGL
Course Code	**WEB TECHNOLOGY AND ITS APPLICATIONS - 15CS71**
CO1	Illustrate the Semantic Structure of HTML and CSS
CO2	Compose forms and tables using HTML and CSS
CO3	Design Client-Side programs using JavaScript and Server-Side programs using PHP
CO4	Infer Object Oriented Programming capabilities of PHP
CO5	Examine JavaScript frameworks such as jQuery and Backbone
Course Code	**ADVANCED COMPUTER ARCHITECTURES - 15CS72**
CO1	Describe computer architecture.
CO2	Measure the performance of architectures in terms of right parameters.
CO3	Summarize parallel architecture and the software used for them
Course Code	**MACHINE LEARNING - 15CS73**
CO1	Define machine learning and problems relevant to machine learning.
CO2	Differentiate supervised, unsupervised and reinforcement learning
CO3	Apply neural networks, Bayes classifier and k nearest neighbor, for problems appear in machine learning.
CO4	Perform statistical analysis of machine learning techniques.
Course Code	**INFORMATION AND NETWORK SECURITY - 15CS743**
CO1	Analyze the cryptographic processes.
CO2	Summarize the digital security process.
CO3	Indicate the location of a security process in the given system
Course Code	**Sub: STORAGE AREA NETWORKS - 15CS753**
CO1	Evaluate storage architectures,
CO2	Define backup, recovery, disaster recovery, business continuity, and replication
CO3	Examine emerging technologies including IP-SAN
CO4	Understand logical and physical components of a storage infrastructure

Course Code	**MACHINE LEARNING LABORATORY - 15CSL76**
CO1	Make use of Data sets in implementing the machine learning algorithms
CO2	Implement the machine learning concepts and algorithms in any suitable language of choice
Course Code	**WEB TECHNOLOGY LABORATORY WITH MINI PROJECT - 15CSL77**
CO1	Design and develop static and dynamic web pages.
CO2	Familiarize with Client-Side Programming, Server-Side Programming, Active server Pages.
CO3	Learn Database Connectivity to web applications