COURSE OUTCOMES

17PCD23 PCD
- Interpret the basic principles of C Programming.
- Acquire decision making and looping concepts.
- Design and develop modular programming.
- Explore usage of Arrays, strings, structures and files.
- Effective utilization of pointers and preprocessor directives.
- Illustrate the concepts of various data structures.

15CS32 ADE
- Analyze the performance of FETs, Opamp circuits & their applications.
- Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.
- Analyze and design various data processing circuits.
- Realize the working of various flip flops and their applications.
- Interpret & analyze the performance of A/D and D/A converters.
- Implement logic circuits using HDL models.

15CS33/10CS35 DS
- Demonstrate and classify various data structures and their primitive operations.
- Apply the concepts of arrays and strings in sorting and pattern matching applications.
- Implement the operations of linear data structures like stacks, queues and linked lists.
- Demonstrate primitive operations on different types of trees and their applications.
- Summarize the concepts of graphs, traversal techniques, hashing and file handling.
- Design and develop solutions to solve various computing problems by choosing appropriate data structures.

15CS34/10CS46 CO
- Visualize the basic building blocks of computer.
- Analyze the programs as sequence of machine instructions.
- Explore different ways of communicating with I/O devices and interfaces.
- Design and evaluate the performance of memory systems.
- Demonstrate arithmetic and logical operations with integer and floating point operands.
- Analyze the basic functional units of processor.

15CS35/10CS44 USP
- Conceptualize the features of UNIX Architecture.
- Interpret basic commands for file attribute manipulation.
- Demonstrate functioning of Vi editor and its commands.
- Illustrate the usage of various UNIX filter commands.
- Design programs using shell scripts.
- Analyze process life cycle development & demonstrate Perl programs.

15CS36/10CS34 DMS
- Verify the correctness of an argument using logic & truth tables.
- Demonstrate the ability to solve problems using counting techniques and combinations.
- Apply Mathematical induction in solving problems.
- Solve problems using recurrence relations and generating functions.
- Differentiate and apply graphs and trees concepts in solving real life problems.
- Demonstrate abstraction, notations & critical thinking related to CSE.

15CSL37 ADE LAB
- Utilize various electronic devices to design and construct the analog circuits.
- Use simulation package like multisim to design analog circuits.
- Use various digital integrated circuits in the design and demonstration of various combinational logic and data processing circuits.
- Design and demonstrate various types of sequential circuits using flip flops.
- Use simulation package like modelsim to design various digital circuits.
- Understand the working and implementation of DAC & ALU.

15CSL38/10CSL37 DS LAB
- Solve computational problems using basic C language constructs.
- Design and implement operations on both single and Multidimensional arrays.
- Develop menu driven programs to demonstrate primitive operations on stacks & queues.
- Assess the operations on different types of Trees.
- Demonstrate traversal techniques on graphs.
- Apply appropriate data structures to solve computing problems.

15CS42 SE
- Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.
- Demonstrate process of requirements gathering, classification, specification & validation.
- Design models for software system, component and process within realistic constraints.
- Apply cost estimation and time scheduling for quality project activities.
- Apply, design, implement, verify, validate and maintain software systems with metrics.
- Recognize the need for agile software development.

15CS43/10CS43 DAA
- Restate various algorithmic approaches & various problem types.
- Formulate the analysis frameworks for algorithms.
- Design, Develop and Analyze the algorithms for problems on searching and sorting.
- Design and Develop algorithms to solve various problems based on graphs and trees.
- Compare different classes of problems such as P, NP, NP Complete and NP hard.
- Design, Develop and Analyze the algorithms for various computational problems.

15CS44 MP & MC
- Illustrate 8086 Architecture and Addressing modes.
- Develop x86 assembly language code to solve the problems.
- Demonstrate interrupt routines.
- Interface various I/O, memory devices to x86 processor.
- Explore ARM fundamentals and instruction set.
- Develop ARM programming skills.

15CS45 OOC
- Understand object oriented programming concepts using C++.
- Apply fundamental concepts of OOP in JAVA.
- Implement JAVA programs using Java JDK environment.
- Develop multithreaded and event handling programs.
- Explore usage of JAVA packages and Interfaces.
- Implement event driven GUI using Applets and Swings.

15CS46/10CS55 DC
- Identify various types of computer networks & connecting devices.
- Evaluate the data transmission techniques.
- Illustrate TCP/IP protocol suite and switching criteria.
- Analyze different error checking methods used in Data Link layer.
- Demonstrate medium access control protocols, wireless & wired LAN architecture.
- Differentiate IP versions : IPV4, IPV6 and Mobile IP.

15CSL47/10CSL47 DAA LAB
- Develop solutions for computing problems using JAVA constructs.
- Design, implement and asymptotically analyze various algorithms on Sorting.
- Design and implement algorithms to solve problems on Graphs.
- Design and develop algorithms to solve combinatorial problems.
- Choose appropriate algorithmic techniques to solve computational problems.
- Analyze algorithms to deduce their time complexities.

15CSL48 MP MC LAB
- Demonstrate x86 instruction set and addressing modes.
- Design and implement x86 assembly language programs.
- Explore the functioning of hardware devices and its interfacing.
- Demonstrate ARM instruction set and addressing modes.
- Implement ARM assembly and C language programs.
- Implement interfacing of hardware devices to ARM family.

15CS51 M&E
- Comprehend Management activities.
- Emphasize Entrepreneur concepts & outline their importance in entrepreneurship.
- Apply Enterprise Resource Planning (ERP) solutions for IT industry.
- Propose the methods for establishing micro, small and large scale enterprises.
- Apply IPRs and institutional support for entrepreneurship.
- Prepare project report for IT industry based on feasibility studies.

15CS52 CN
- Demonstrate the principles of application layer protocols.
- Distinguish transport layer services and protocols.
- Classify IP and Routing Algorithms in network layer.
- Characterize the Wireless and Mobile Networks covering IEEE 802.11Standard.
- Demonstrate streaming and working of Distribution servers.
- Exemplify Network support for multimedia.

15CS53 DBMS
- Represent database with different data modeling concepts.
- Design simple database systems.
- Use Structured Query Language (SQL) for building and manipulating database.
- Develop application to interact with databases.
- Analyze and apply normalization for better database design.
- Demonstrate the use of concurrency control and transaction processing.

15CS54 ATC
- Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation.
- Translate between different models of Computation.
- Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
- Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata.
- Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.
- Classify a problem with respect to different models of Computation.

15CS553 Adv JAVA
- Interpret enumerations and collections in advanced Java.
- Build programs using collection framework.
- Illustrate and develop String Handling methods in JAVA.
- Apply Servlets to develop web applications.
- Demonstrate database access using JDBC API.
- Design reusable software components using JSP.

15CS562 AI
- Identify the AI based problems.
- Determine the technique to solve the AI problems.
- Investigate various learning techniques.
- Analyze expert systems.
- Explore different stages in Natural Language processing.
- Implement appropriate learning algorithms.

15CSL57 CN LAB
- Understand error detection technique using CRC.
- Analyze and compare different routing protocols.
- Implement connection-oriented and connectionless protocols in the network.
- Demonstrate security features in networks using RSA algorithm.
- Analyze techniques to avoid congestion in the network.
- Implement, analyze and evaluate networking protocols using NS-3 Tool.

15CSL58 DB LAB
- Demonstrate DDL commands[create, drop, alter] on Database.
- Create ER diagrams and conceptual schema for the problems given.
- Apply Integrity constraints on relations.
- Demonstrate Update operations.
- Demonstrate more complex SQL queries.
- Implement, analyze and evaluate the project developed for an application.

15CS61 CNSCL
- Apply the basics of number theory in various cryptographic techniques and summarize its applications.
- Design and develop simple cryptography algorithms for real world situation.
- Analyze various authentication and key agreement protocols.
- Realize the security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems.
- Investigate the need of security at different levels/layers and its services.
- Understand cyber security and illustrate the need of cyber Law.

15CS62 CG&V
- Design and implement algorithms for 2D graphics primitives and attributes.
- Illustrate geometric transformations on both 2D and 3D objects.
- Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and illumination models.
- Decide suitable hardware and software for developing graphics applications using OpenGL.
- Explore different representation of Programming event driven input.
- Demonstrate and analyze the concepts of curve surfaces.

15CS63 SS&CD
- Interpret the concepts of assemblers and macro processors.
- Illustrate the functions, features and design options of loader.
- Classify the phases of compiler and build lexical analyzers.
- Design parsers for compilers.
- Construct Syntax Directed Translation and generate intermediate code.
- Generate ASM code for a given intermediate code.

15CS64/10CS53 OS
- Identify the functionalities of OS and their categories.
- Evaluate multithread techniques and process scheduling algorithms.
- Demonstrate suitable techniques for resource management.
- Evaluate file system allocation and memory management techniques.
- Review the protection mechanisms in processing environment.
- Explore the case studies on Operating Systems.

15CS651 DMDW
- Illustrate concept of data warehousing &OLAP.
- Explore multidimensional data model.
- Analyze different data types and preprocessing methods.
- Evaluate various association algorithms and their applications.
- Apply different classification methods.
- Evaluate various clustering techniques.

10CS661/15CS653 OR
- Understand how to translate a real-world problem into mathematical formulation.
- Identify and apply optimization techniques for various problems.
- Model the given problem as transportation problem and solve.
- Apply game theory for decision support system.
- Analyze and apply branch-and-bound and heuristic methods to solve general integer problems.
- Incorporate the principles of assignment of jobs and find the optimal solution.

15CS664 PYTHON
- Examine python syntax & semantics and be fluent in using flow control & functions.
- Demonstrate proficiency in handling strings and file systems in python.
- Create & run python programs using core data structures like lists, dictionaries , tiples, and sets and use of REs.
- Interpret and apply the concepts of OOP.
- Implement exemplary applications related to network programming and web services.
- Implement database applications in python.

15CSL67 SS&OS LAB
- Implement Lex programs using Lex tool.
- Implement Yacc programs using Lex and Yacc tools.
- Design and implement parsers and code generators using C.
- Evaluate different process scheduling algorithms of operating System.
- Design & implement Banker's algorithm for deadlock avoidance.
- Evaluate different algorithms to manage page allocation.

15CSL68 CGV LAB WITH MINI PROJECT
- Apply the concepts of computer graphics.
- Implement computer graphics applications using OpenGL.
- Animate real world scenarios using OpenGL.
- Rasterize 2D primitives using OpenGL.
- Implement different clipping algorithms.
- Transform 2D and 3D geometric objects.

15CS71 WT & A
- Realize HTML & CSS syntax and semantics to build web pages.
- Construct and visually format tables and forms using HTML and CSS
- Examine Client-Side Scripting using JavaScript.
- Develop Server-Side Scripts using PHP.
- Appraise the principles of object oriented development using PHP.
- Illustrate jQuery framework.

15CS72 ACA
- Understand the concepts of parallel computing.
- Demonstrate the concepts of hardware technologies.
- Explore bus, cache, shared memory with pipelining and super scalar techniques.
- Classify parallel architecture.
- Assess Scalable architecture.
- Investigate parallel programming concept.

15CS73 ML
- Understand machine learning and problems relevant to machine learning.
- Analyze concept learning and decision trees.
- Apply artificial neural networks in machine learning.
- Interpret and realize Bayesian methods.
- Investigate instance based learning.
- Evaluate hypothesis and examine reinforcement learning.

15CS741 NLP
- Understand the challenges and applications of NLP.
- Illustrate semantics and pragmatics of language for NLP.
- Analyze the natural language text at word level and semantic level.
- Establish dependency path and annotate knowledge role.
- Demonstrate techniques and tools used in Text mining.
- Explore various information retrieval techniques.

15CS744 USP
- Distinguish ANSI C & POSIX standards.
- Analyse UNIX Kernel support for files and the system calls.
- Understand Kernel support for process.
- Familiarize Process Accounting and process control.
- Examine signal handling and Daemon process.
- Demonstrate interprocess and client server communication.

15CS754 SAN
- Examine the Storage Area Networks characteristics, components and storage architectures.
- Exemplify the concept of RAID and their suitability for different application environments.
- Analyze file sharing operations on NAS and IP-SAN of the different networks.
- Depict the working of Storage Virtualization on Various levels of Storage.
- Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure.
- Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud.

15CSL76 ML LAB
- Implement and demonstrate the concept learning algorithms (FIND-S, Candidate-Elimination).
- Demonstrate the working of the decision tree and apply this knowledge to classify a new sample.(ID3)
- Build an Artificial Neural Network by implementing the Back propagation algorithm.
- Apply the naïve Bayesian classification methods and build Bayesian network.
- Implement EM algorithm, k-means and Compare their results.
- Investigate instance based and regression algorithms.

Code	Course Outcomes
15CSL77 WT LAB	Develop web pages using HTML5 and CSS.
	Design dynamic web pages using JavaScript.
	Create interactive web applications using PHP.
	Explore different Web Services, Internet Tools and Database connectivity.
	Design and Develop Web project.
	Evaluate and Document Web project.
10CS32 EC	Acquire the knowledge of the fundamental aspects of diode, BJTs and FETs its characteristics.
	Apply the engineering knowledge to design and develop amplifier circuits using BJTs and FETs.
	Demonstrate the effects of negative feedback on different parameters of an Amplifier and various types of negative feedback topologies.
	Acquire the knowledge of classifications of Power amplifier using BJT/FET operation.
	Integrate the knowledge to distinguish different power amplifiers and for suitable applications.
	Illustrate the working of non linear op amp circuits.
10CS33 LD	Analyze Digital logic & apply combinational logic simplifications.
	Analyze and design arithmetic circuits and various data processing circuits.
	Realize clock circuit and working of various flip flops and its applications.
	Design sequential logic circuits.
	Interpret and analyze D/A and A/D converters.
	Implement logic circuits using HDL models.
10CS36 OOP WITH C++	Demonstrate and classify various data structures and their primitive operations.
	Apply the concepts of arrays and strings in sorting and pattern matching applications
	Implement the operations of linear data structures like stacks, queues and linked lists.
	Demonstrate primitive operations on different types of trees and their applications.
	Summarize the concepts of graphs, traversal techniques, hashing and file handling.
	Design and develop solutions approaches to solve various computing problems by choosing appropriate data structures.
10CSL38 EC & LD LAB	Identify various analog components and demonstrate the working of analog equipments.
	Design and construct various analog circuits.
	Simulate various analog circuits using multisim.
	Identify various digital components and demonstrate the working of digital equipments.
	Design and construct various digital circuits.
	Simulate various digital circuits using modelsim (xilinx).
10MAT41 MATHS	Solve first and second order ordinary differential equations arising in flow problems using numerical methods.
	Solve problems of quantum mechanics, hydrodynamics and heat conduction by employing Bessel's function and Legendre's polynomials.
	Understand the analyticity, poles and residues of complex potentials in field theory and electromagnetic theory. Describe conformal and bilinear transformation arising in aerofoil theory, fluid flow visualization and image processing.
	Solve problems on probability distributions relating to digital signal processing, information theory and optimization concepts of stability of design and structural engineering.
	Determine joint probability distributions and stochastic matrix connected with the multivariable correlation problems for feasible random events.
	Draw the validity of the hypothesis proposed for the given sampling distribution in accepting or rejecting the hypothesis.
	Define transition probability matrix of a Markov chain to solve problems related to discrete parameter random.
10CS42 GT	Describe the Concept of graph theory along with the properties.
	Apply graphs as representation tools in a network analysis.
	Solve the Combinatory and Permutations related problems.
	Solve Recurrence relation and Generating Functions.
	Describe the Concept of graph theory along with the properties.
	Apply graphs as representation tools in a network analysis.
10CS45 MP	Visualize 8086 Architecture.
	Illustrate 8086 Addressing modes.
	Develop 8086 assembly language to solve problems.
	Understand the 8086 pin functions and hardware specifications.
	Realize 8088/86 memory interfacing and solve problems.
	Conceptualize I/O interfacing and Interrupts.

Code	Course Outcomes
10CSL48 MP LAB	Realize 80x86 instruction sets and attain knowledge of assembly language.
	Comprehend x86 instruction set and addressing modes.
	Implement x86 assembly language programs.
	Explore functioning of hardware devices and its interfacing.
	Analyze functioning of 8255 PPI to configure the ports for interfacing devices.
	Implement 8086 interfacing with hardware devices.
10CS51 SE	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.
	Demonstrate the process of requirements gathering, classification, specification and validation.
	Design models for software system, component and process within realistic constraints.
	Apply, design, implement, verify, validate and maintain software systems with metrics.
	Apply cost estimation and time scheduling for quality project activities.
	Recognize the need for agile software development.
10CS52 SS	Distinguish different software into different categories.
	Design, analyze and implement one pass, two pass or multi pass assembler.
	Design, analyze and implement loader and linker.
	Design, analyze and implement macro processors.
	Critique the features of modern editing /debugging tools.
	Write simple LEX and YACC programs by understanding the concepts.
10CS54 DBMS	Represent database with different data modeling concepts.
	Design simple database systems.
	Apply Relational Algebra concepts to data model.
	Use Structured Query Language (SQL) for building and manipulating database.
	Analyze and apply normalization for better database design.
	Demonstrate the use of concurrency control and transaction processing.
10CS56 FLAT	Understand, design and convert FA for a given RL.
	design RE for given language and convert RE to FA.
	design grammars, and simplify the grammar.
	Analyze and design CFL and CFG.
	Understand the working and the applications of TM.
	Classify a problem with respect to different models of Computation.
10CSL57 DBMS LAB	Understand DBMS concepts.
	Design E-R diagram.
	Implement DDL statements.
	Demonstrate DML statements.
	Design the front end using additional tools.
	Integrate front end and back end.
10CSL58 SS & OS LAB	Demonstrate the working of Lexer and Parser.
	Design and develop programs using LEX and YACC tool.
	Implement shell interpreter commands.
	Develop programs to handle UNIX system calls.
	Evaluate resource allocation and scheduling algorithms of OS.
	Design and develop multi-threaded programs using OpenMP.
10CS62 USP	Distinguish among ANSI C and POSIX standards.
	Illustrate UNIX Kernel support for files.
	Identify Kernel support for process.
	Interpret Process Accounting, process UID, Terminal logins and network logins.
	Analyze process control, Deamon characteristics, coding rules & error logging.
	To build an application/service over a UNIX system.
10CS63 CD	Visualize the different phases of compilation.
	Design of Lexical analyzers.
	Design Parsers(LL, LR, CLR & LALR) and write yacc programs.
	Develop skills in generating syntax directed translation and different methods of intermediate representation.
	Building an environment for compilation and generating intermediate code.
	Analyze how to develop code & design a compiler for concise programming language.
10CS64 CN-II	Classify IP and Routing Algorithms in network layer.
	Distinguish transport layer services and protocols.
	Illustrate the basic concepts of network security.
	Analyze routing in Mobile Ad-Hoc and Wireless Sensor Networks.
	Interpret the QOS parameters.
	Demonstrate Multimedia Networking and Voice Over IP.

Code	Course Outcomes
10CS65 CG&V	Realize the basics of computer graphics, different graphics system and applications of computer Graphics.
	Illustrate the concepts of opengl.
	Demonstrate the program event driven concepts.
	Analyze the representation of transformation in 2D and 3D.
	Explore the significance of viewing and projections.
	Develop various algorithms to scan, convert the basic geometrical primitives, transformations, Area Filling and clipping.
10CSL67 CG&V LAB	Understand openGL primitives
	Implement pattern representation using openGL
	Analyze transformation functions using openGL
	Demonstrate the scan filling algorithms
	Illustrate clipping concepts
	Demonstrate the concepts of lighting
10CSL68 USP LAB	Distinguish among ANSI C & POSIX standards.
	Illustrate UNIX Kernel support for files.
	Understand Kernel support for process.
	Interpret Process Accounting, process UID ,Terminal logins, network logins.
	Analyze process control, Deamon characteristics, coding rules and error logging.
	To build an application/service over a UNIX system.
10CS71 OOMD	Outline the concepts of object-oriented and modeling.
	Categorize the relationship among various objects.
	Analyze the significance of class and state modeling
	Design interaction modeling using Unified Modeling Language(UML).
	Construct models to show the importance of systems analysis and design in solving complex problems.
	Apply a befitting design pattern for the given problem.
10CS72 ECS	Identify building blocks of embedded system.
	Explore various devices, device drivers and distributed network communication protocols.
	Build ARM/C programs for embedded systems.
	Apply RTOS for Real time applications.
	Analyze CPUs performance, program optimization, test and validation.
	Demonstrate embedded development software tools for target machine.
10CS73 PW	Understand the Semantic Structure of markup languages.
	Illustrate the purpose of Cascading Style Sheets in Web development.
	Understand the various concepts of scripting languages.
	Build Dynamic XHTML documents using Document Object Model(DOM).
	Design Client/Server applications using Scripting languages.
	Develop web applications using frameworks.
10CS74 ACA	Understand, classify & evaluate performance of various computer architectures.
	Analyze various techniques to enhance processors ability to exploit Instruction-level parallelism and its challenges.
	Understand and analyze thread-level parallelism.
	Analyze cache coherence problem and measure its performance.
	Illustrate the memory organization, cache optimization and memory technology.
	Perceive and enhance parallelism in modern computers.
10CS753 JAVA	Asses the fundamental principles of OOP.
	Apply Object Oriented paradigms in JAVA language.
	Develop effective user interfaces using java Swing.
	Implement JDBC features to build database-driven enterprise applications.
	Develop client server web applications with JSP and Servlets.
	Apply EJB containers to deploy EJB applications.
10CS761 C#.NET	Understand basic building blocks of Dot Net.
	Assimilate C# Fundamentals, Exception handling and life time of the objects.
	Design Interfaces and Collections in C#.
	Develop simple file test assembly.
	Implement abstract classes and extending interfaces.
	Demonstrate properties, index, delegate, event and namespace of C#.
10CSL77 CN LAB	Demonstrate error detection technique using CRC.
	Analyze and compare different routing protocols.
	Implement connection-oriented and connectionless protocols in the network.
	Demonstrate security features in networks using RSA algorithm.
	Analyze techniques to avoid congestion in the network.
	Implement, analyze and evaluate networking protocols using NCTUNS Tool.

Code	Course Outcomes
10CSL78 WEB LAB	Identify elements and attributes of web pages.
	Develop web pages using HTML, XHTML and CSS.
	Design dynamic web pages using JavaScript.
	Create interactive web applications using PHP.
	Build web applications using Perl.
	Implement web applications using Ruby.
10CS81 SA	Appraise the Business cycle fundamentals and various styles.
	Design and document methodologies of Software Architecture.
	Demonstrate the quality attributes of Software Architecture.
	Apply the Tactics of Software Architecture for software design.
	Explore the categories of Architectural Patterns.
	Develop Design Patterns of Software Architecture.
10CS82 SSM	Interpret the basic principles, characteristics and models of simulation.
	Construct simulation models for real world problems exploring Event-Scheduling / Time-Advance Algorithms.
	Adapt the concept of queuing theory and evaluate the performance of various queuing models.
	Demonstrate the use of random numbers in simulation systems.
	Estimate the parameters for testing using appropriate methods.
	Apply the verification, validation and calibration process to the simulation models.
10CS835 INS	Identify the critical characteristics of Information Security, planning security and contingency strategies.
	Analyze the various security technologies like firewalls, VPNs and IDS.
	Compare various Symmetric and Asymmetric Cryptographic methods used for Network Security.
	Summarize different Authentication Techniques.
	Analyze IP Security Architecture &Transport Layer Security.
	Identify the need of application layer security.
10CS842 ST	Analyze boundary value, equivalence class and decision table based testing.
	Apply path and data flow testing.
	Assess integration, system and interaction testing.
	Analyze the process of quality and testing framework.
	Investigate the need for fault based testing, test execution planning and process monitoring.
	Articulate test strategies and analyze reports.