Vidyavardhini's college of Engineering & Technology Vasai(w)
Department of Computer Engineering
Course Outcomes for R - 2016 Syllabus

Program Outcomes
PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2. 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.
PO3. 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.
PO4. 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.
PO5. 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.
PO6. 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.
PO7. 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.
PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10. 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.
PO11. 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.
PO12. 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
Program Specific Outcomes
PSO1: Analyze problems and design applications of database, networking, security, web technology, cloud computing, machine learning using mathematical skills, and
PSO2: Develop computer-based systems to provide solutions for organizational, societal problems by working in multidisciplinary teams and pursue a career in the IT industry.

Course Outcomes	
	At the end of the semester student will able to
FEC101	**Applied Mathematics I**
FEC101.1	Apply principles of basic operations of matrices , rank and echelon form of matrices to solve linear simultaneous equations.
FEC101.2	Able solve and Analyze Partial Derivatives and apply it in related field of Engineering
FEC101.3	Able apply the concepts of Complex Numbers,hyperbolic functions and logarithmsto solve engineering problems.
FEC101.4	Able apply Numerical Methods and Inculcate the habit of Mathematical thinking through Indeterminate forms, Taylor's Series Expansion and by using Scilab.
FEC102	**Applied Physics I**
FEC102.1	Draw miller indices using concept of crystallography and Identify crystal structure using X-ray diffraction techniques viz. Laue method, rotating crystal method & powder method
FEC102.2	Determine the output of LED, photoconductor and photovoltaic cell applying concepts of semiconductor physics.diffractometer
FEC102.3	Calculate parameters of superconductor viz. Critical temperature, critical magnetic field and differentiate application of superconductor based on Meslnner effect and Josephson effect
FEC102.4	Design acoustic of hall/auditorium using reasons for acoustic defects and Select method for production of ultrasonic waves.
FEC103	**Applied Chemistry I**
FEC103.1	Analyze the quality of water and suggest methods of treatment.
FEC103.2	Illustrate the knowledge of polymers, fabrication methods, conducting polymers in industrial fields.
FEC103.3	Apply the knowledge of lubricants, their properties & mechanism to avoid frictional resistance and interpret phase transformations using thermodynamics
FEC103.4	Demonstrate knowledge of portland cement.
FEC104	**Engineering Mechanics**
FEC104.1	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
FEC104.2	Demonstrate the understanding of Centroid and its significance and locate the same
FEC104.3	Estimate required force to overcome friction and correlate real life application to specific type of friction.
FEC104.4	Establish relation between velocity and acceleration of a particle and analyse the motion by plotting the relation.
FEC104.5	Illustrate different types of motions and establish Kinematic relations for a rigid body.
FEC104.6	Analyse body in motion using force and acceleration, work-energy, impulse- momentum principles
FEC105	**Basic Electrical Engineering**
FEC105.1	To understand fundamentals of DC circuits and apply knowledge for analyzing network theorems in DC circuits.
FEC105.2	Able to learn the fundamentals and analyze single phase AC circuits.
FEC105.3	Able to learn the basic operation and analyze the performance of single-phase transformer.
FEC105.4	Able to learn the fundamentals and analyze three phase AC circuits and understand the construction, basic operation of DC motors and generators.
FEC106	**Environmental Studies**

FEC106.1	Classify essential resources and control measures for sustainable development.
FEC106.2	Illustrate sources and effects of environmental decay.
FEC106.3	Select renewable sources of energy and technology essential for sustainable development.
FEC106.4	Apply the regulations of Environmental Protection Act and other bodies for perpetuation of environment.
FEL101	**Basic Workshop Practice I**
FEL101.1	Model different prototypes in the carpentry trade such as Cross cut lap joint, Tee lap joint, Dovetel lap joint.
FEL101.2	Model various basic prototypes in the trade of fitting such as Square, Hexagonal and V Male Female joint.
FEL101.3	Perform various basic House Wiring techniques while taking care of electrical safety.
FEL101.4	Perform various basic domestic plumbing operations such as pipe cutting, threading, fitting etc.
FEC201	**Applied Mathematics II**
FEC201.1	Able to apply euler, runge kutta method to solve differential equations of second and fourth order and apply trapezoidal, simpson's 1/3rd, simpson's ⅜ th rule to solve definite integrals numericaly and by using scilab.
FEC201.2	Able to solve differential equations of first order, first degree and engineering problems representable in form of linear differential equations with constant coefficients, Cauchy's/Legendre's homogenous equations
FEC201.3	Able to apply Beta, Gamma functions and D.U.I.S.
FEC201.4	Able to apply double /triple integration to find area, mass, volume and find length of the curve using scilab and rectification method.
FEC202	**Applied Physics II**
FEC202.1	Calculate thickness of thin wire or foil to wedge-shaped thin film, refractive index, wavelength of light /or radius of curvature to Newton's rings in interference application and calculate missing order, grating element wavelength of light using diffraction grating considering parameter viz resolving power of grating
FEC202.2	Compare characteristics of images received by photography and holography using concept of LASER
FEC202.3	Calculate critical angle, angle of acceptance, V number, number of modes of propagation, numerical aperture of step index fibre
FEC202.4	Apply concept of electromagnetism in focussing system and CRO
FEC203	**Applied Chemistry II**
FEC203.1	Illustrate types of corrosion & suggest control measures in industries.
FEC203.2	Analyze the quality of fuel & calculate the oxygen required for combustion of fuel.
FEC203.3	Illustrate composition, properties of alloys & properties & application of composite material.
FEC203.4	Illustrate the principles of green chemistry
FEC204	**Engineering Drawing**
FEC204.1	Apply the basic principles of projections in Projection of Lines, Planes and Engineering Curves
FEC204.2	Apply the basic principles of projections in Projection of Solids & Section of solids
FEC204.3	Visualize the given 3D object and draw Orthographic projections
FEC204.4	Draw Isometric view from the given orthographic projections
FEC204.5	Draw Orthographic and Isometric Projection using AutoCad
FEC205	**Structured Programming**
FEC205.1	Identify the terminologies in operating system used for computer programming and illustrate the algorithms to support Structure Programming Approach.
FEC205.2	Use Variables, derived data types and control structures to write C program.
FEC205.3	Implement solutions to the problem using strings and functions.
FEC205.4	Use Pointers, Structure-Union and Files for solving complex Computational problem.
FEC206	**Communication Skills**
FEC206.1	To develop the ability to understand the importance of communication fundamentals and its usage in social context
FEC206.2	Develop message generating and delivery skills, gain insight into their own speaking skills
FEC206.3	Can draft letters and other technical documents paying attention to the writer's objectives and reader's needs
FEC206.4	Implement all the important aspects of reading including skimming, scanning, note making and discourse coherence
FEL201	**Basic Workshop II**
FEL201.1	Model different prototypes in the carpentry trade such as Cross cut lap joint, Tee lap joint, Dovetel lap joint.
FEL201.2	Model various basic prototypes in the trade of fitting such as Square, Hexagonal and V Male Female joint.
FEL201.3	Read various basic Layout drawing; make positive and negative film, and perform PCB etching and drilling, Tinning and soldering operations.
FEL201.4	Dismantle and Assemble a Personal Computer, perform Basic troubleshooting and maintenance, identify network components and perform Basic networking and crimping.
CSC301	**Applied Mathematics III**
CSC301.1	Apply the concept of Fourier Series for expansion of periodic functions.
CSC301.2	Apply Laplace transform, Inverse Laplace transform & Z- transform to different applications.
CSC301.3	Perform data analysis using correlation and regression.
CSC301.4	Understand complex variables and functions and perform mapping using different techniques.
CSC302	**Digital Logic Design And Analysis**
CSC302.1	Convert one number system to another and to realize logic circuits using basic/universal gates.
CSC302.2	Analyze and design combinational circuits using gates/multiplexers.
CSC302.3	Analyze and design sequential circuits using Flip Flops.
CSC302.4	Compare CMOS, TTL logic families and analyze modeling styles in VHDL for combinational/sequential circuits.
CSC303	**Discrete Mathematics**
CSC303.1	Apply set notations and rules of mathematical logic for problem solving
CSC303.2	Relate sets to analyze lattices and identify functions.

CSC303.3	Solve problems using counting techniques, functions and represent them in the form of graphs.
CSC303.4	Use groups and codes in Encoding – Decoding.
CSC304	**Electronic Circuits and Communication Fundamentals**
CSC304.1	Analyze bipolar junction transistor and compare oscillators, power amplifiers in communication system.
CSC304.2	Analyze inverting/non-inverting operational amplifiers, their applications.
CSC304.3	Compare AM / FM Modulation / Demodulation techniques.
CSC304.4	Compare Pulse Modulation generation/detection, Multiplexing techniques and analyze amount of information, average information, information rate, channel capacity in Information Theory.
CSC305	**Data Structures**
CSC305.1	Identify data structure suitable to the problem definition
CSC305.2	Demonstrate operations on linear data structures
CSC305.3	Use methods of organizing large amounts of data for non linear data structures.
CSC305.4	Use appropriate searching and/or sorting technique for application development
CSL301	**Digital System Lab**
CSL301.1	Implement & verify the truth table of Boolean algebra, logic gates using ICs on breadboard.
CSL301.2	Implement & verify the truth table of combinational circuits using ICs on breadboard.
CSL301.3	Implement & verify the truth table of sequential circuits using ICs on breadboard.
CSL301.4	Implement logic gates using VHDL.
CSL302	**Basic Electronics Lab**
CSL302.1	Measure the voltage, frequency and observe waveforms using function generator and CRO.
CSL302.2	Analyze BJT circuits and calculate AC / DC parameters.
CSL302.3	Implement inverting, non-inverting amplifier, adder, subtractor circuits using IC 741.
CSL302.4	Observe the input -output waveforms of AM, FM, PAM, PWM and PPM circuits.
CSL303	**Data Structure Lab**
CSL303.1	Implement Operations on Linear Data Structure - Stack, Queue.
CSL303.2	Implement Operations on Linear Data Structure - Singly Linked List, Doubly Linked List
CSL303.3	Implement Operations on Non Linear Data Structure - Tree and Graph
CSL303.4	Implement Searching and Sorting Algorithms - Binary Search, Quick Sort, Merge Sort.
CSL304	**OOPM(JAVA) Lab**
CSL304.1	Implement java programming constructs using tokens and control statements.
CSL304.2	Implement program using string, array, class, object and packages.
CSL304.3	Implement inheritance, interface, exception handling and multithreading
CSL304.4	Develop Graphical User Interface using JAVA
CSC401	**Applied Mathematics-IV**
CSC401.1	Apply matrix theory to solve the system of linear equations and eigen values and eigen vectors and their applications.
CSC401.2	Apply probability theory and find statistical measures for discrete and continuous random variables.
CSC401.3	analytic functions inside circle.
CSC401.4	Solve the problems using various optimization techniques to optimize LPP & NLPP .
CSC402	**Analysis of Algorithms**
CSC402.1	Calculate the efficiency of an algorithm and analyze the problem using divide and conquer approach.
CSC402.2	Apply Greedy and Dynamic Programming strategies to solve real world problems.
CSC402.3	Analyze problems on backtracking, branch and bound strategies.
CSC402.4	Analyze strategies of NP Complete problems and use String Matching Algorithms.
CSC403	**Computer Organization and Architecture**
CSC403.1	Classify levels in computer system and apply arithmetic algorithms to solve ALU operations.
CSC403.2	Analyze the data processing operations of central processing and compare hardwired/microprogrammed control unit.
CSC403.3	Classify parameters of cache/virtual memory and implement memory mapping techniques.
CSC403.4	Compare data transfer techniques and identify the components of 8089/superscalar/multi-core processor architecture.
CSC404	**Computer Graphics**
CSC404.1	Apply scan conversions algorithms to draw point, line, circle, ellipse and scan line, flood fill, boundary fill algorithms.
CSC404.2	Apply 2D geometric transformations, viewing and line / polygon clipping algorithms on graphical objects
CSC404.3	Apply 3D geometric transformations, clipping algorithm on graphical objects, construct the curves, and derive the matrix for projection.
CSC404.4	Compare visible surface detection techniques, illumination models and surface rendering.
CSC405	**Operating Systems**
CSC405.1	Apply techniques of process scheduling, thread, process synchronization and deadlock in OS.
CSC405.2	Develop performance of memory allocation and replacement techniques
CSC405.3	Identify file systems including Linux virtual file system.
CSC405.4	Analyze the features of I/O management and techniques of disk Scheduling in OS
CSL401	**Analysis of Algorithm Lab**
CSL401.1	Implement Greedy Algorithms for Fractional Knapsack, Prim's and Kruskal's Algorithm.

CSL401.2	Implement Dynamic Programming algorithms for All pairs Shortest path, 0/1 Knapsack Problems
CSL401.3	Implement Backtracking algorithms for Nqueen Problem, Sum of Subset Problem.
CSL401.4	Analyze the performance of String matching and Sorting Algorithms
CSL402	**Computer Graphics Lab**
CSL402.1	Implement output and filled area primitive algorithms.
CSL402.2	Implement Bezier curve, character generation methods.
CSL402.3	Apply transformation, projection, and clipping algorithms on graphical objects.
CSL402.4	Implement output primitives and sierpinsky gasket using OpenGL.
CSL403	**Processor Architecture Lab**
CSL403.1	Analyze dismantling and assembling of PC.
CSL403.2	Design and simulate Half adder, Full adder circuits
CSL403.3	Design and simulate Ripple carry adder, carry look-ahead adder, ALU.
CSL403.4	Design and simulate memory/Cache memory.
CSL404	**Operating System Lab**
CSL404.1	Implement OS commands and system calls
CSL404.2	Implement SJF, FCFS and Round robin process scheduling algorithms
CSL404.3	Implement first fit/next fit/best fit/worst fit memory management algorithms
CSL404.4	Execute process management techniques and deadlock handling algorithms using CPU-OS simulator.
CSL405	**Open Source Technology Lab**
CSL405.1	Implement python constructs, Files, Directories, text processing in python.
CSL405.2	Execute programs using Object Oriented Concepts, data structure and Networking in python
CSL405.3	Develop application using Database connectivity, Graphical User interface and Django web Framework in Python
CSL405.4	Implement file handling and database handling in perl.
CSC501	**Microprocessor**
CSC501.1	Identify the components and their functions in 16 bit microprocessors.
CSC501.2	Write assembly and Mixed language programs for 8086 microprocessor.
CSC501.3	Design 16-bit 8086 microprocessor based system using memory chips and peripheral chips.
CSC501.4	Classify multicore processors with its advantages
CSC502	**Database Management System**
CSC502.1	Identify characteristics of database management system
CSC502.2	Design ER/EER and Relational model for given case study.
CSC502.3	Apply SQL and relational algebra queries on given problem
CSC502.4	Use normalization, transaction, concurrency and recovery techniques in database system
CSC503	**Computer Network**
CSC503.1	Compare different topologies , terminology of computer networking area and types of transmission media.
CSC503.2	Analyze algorithms for error detection,error correction , multiple access control and identify IP Addressing
CSC503.3	Analyze routing algorithms and congestion control algorithms
CSC503.4	Apply sliding Window technique for TCP Flow control and Use HTTP, SMTP, Telnet, FTP, DHCP ,SNMP protocol at application layer.
CSC504	**Theory of Computer Science**
CSC504.1	Apply NFA/DFA techniques for pattern matching
CSC504.2	Apply specified well defined rules for syntax verification
CSC504.3	Analyze and design PDA, Deterministic Turing Machine for formal languages
CSC504.4	Use computability, decidability, undecidability, complexity classes for formal languages.
CSDLO5012	**Advanced Operating System**
CSDLO5012.1	Identify design issues in advanced operating systems.
CSDLO5012.2	Analyze design aspects and data structures used for file, memory and process subsystem of UNIX OS.
CSDLO5012.3	Compare architectures and processor scheduling algorithms of Multiprocessor OS
CSDLO5012.4	Analyze clock driven: cyclic, Event driven: EDF and rate monotonic real time scheduling algorithms.
CSDLO5013	**Advanced Algorithm**
CSDLO5013.1	Apply algorithm design and analysis techniques for a given problem
CSDLO5013.2	Identify the operations of advanced data structure for given problems
CSDLO5013.3	Identify the role of probability and randomization in analysis of algorithm
CSDLO5013.4	Identify the algorithm to be applied for geometric modeling, networking application and differentiate polynomial and NP complete problems.
CSL501	**Microprocessor Lab**
CSL501.1	Use instruction set to write program for 8086 microprocessor
CSL501.2	Develop programs in assembly language for 8086 microprocessor.
CSL501.3	Develop programs in mixed language for 8086 microprocessor.
CSL501.4	Execute assembly language program by interfacing 8086 microprocessor with 8255 PPI or 8253 PIT.

CSL502	**Computer Network Lab**
CSL502.1	Implement and analyze CRC/Hamming Code Error control algorithms.
CSL502.2	Use Wireshark to simulate the operation of TCP/IP layers
CSL502.3	Implement and analyze TCP/UDP socket programming for Chatting Application
CSL502.4	Apply Linux networking commands and simulate topology using NS2 tools / Packet tracer.
CSL503	**Database & Info.System Lab**
CSL503.1	Design ER and EER diagram for the real life problem with software tool.
CSL503.2	Create database tables with different DDL and DML statements and apply integrity constraints
CSL503.3	Apply SQL queries ,triggers and procedures for specific module/task
CSL503.4	Construct concurrent transactions and able to access data through front end using JDBC ODBC connectivity
CSL504	**Web Design Lab**
CSL504.1	Identify the components of web architecture.
CSL504.2	Design static web pages using HTML, CSS, Javascript Validation
CSL504.3	Create the web page using server side scripting.
CSL504.4	Develop web page using XML, AJAX and Create an application using Laravel Framework .
CSL505	**Business Communication And Ethics**
CSL505.1	Design a technical document using precise language, suitable vocabulary and apt style.
CSL505.2	Develop the life skills/interpersonal skills to progress professionally by building stronger relationships.
CSL505.3	Demonstrate awareness of contemporary issues knowledge of professional and ethical responsibilities.
CSL505.4	Apply the traits of a suitable candidate for a job/higher education, upon being trained in techniques of holding a group discussion, facing interviews and
CSL505.5	Deliver formal presentation effectively implementing the verbal and non-verbal skills.
CSC601	**Software Engineering**
CSC601.1	Select process models for software project development.
CSC601.2	Identify requirements, analyze, prepare models & plan, schedule & the progress of the projects.
CSC601.3	Design, develop the software projects & identify risks, manage the change to assure quality in software projects.
CSC601.4	Apply testing principles on software projects & maintenance models.
CSC602	**System Programming & Compiler Construction**
CSC602.1	Identify the system programs, application programs and design assembler with data structure.
CSC602.2	Design Macro-Processor and Loaders
CSC602.3	Design Analysis phase of Compiler.
CSC602.4	Design synthesis phase of compiler.
CSC603	**Data Warehosing & Mining**
CSC603.1	Apply supervised and unsupervised mining algorithms for a given data set
CSC603.2	Analyze the given transactional data and apply appropriate techniques to identify interesting patterns.
CSC603.3	Design a data warehouse for a given application and perform OLAP operations to take business decisions.
CSC603.4	Apply pre-processing techniques for a given data set and analyze complex data types with respect to Spatial and Web mining
CSC604	**Cryptography & System Security**
CSC604.1	Use classical encryption techniques for data encryption.
CSC604.2	Apply ELGAMAL and Schnorr digital signature algorithms to achieve authentication and design secure applications
CSC604.3	Apply the cryptographic checksum and message digest algorithms to check data integrity
CSC604.4	Evaluate the performance of firewall, SSL and recognize malicious code using firewall.
CSDLO6021	**Machine Learning**
CSDLO6021.1	Identify machine learning techniques suitable for a given problem
CSDLO6021.2	Solve optimization problems using Steepest Descent, Newton method, Random Search, Down Hill Simplex method and implement logical function using MP neuron model.
CSDLO6021.3	Apply classification and regression techniques on a given data set.
CSDLO6021.4	Apply clustering and dimensionality reduction techniques on a given data set.
CSDLO6022	**Advance Database System**
CSDLO6022.1	Build indexing mechanisms for efficient retrieval of information from databases
CSDLO6022.2	Optimize query execution and design distributed database for resource management
CSDLO6022.3	Analyze features of document oriented databases
CSDLO6022.4	Apply appropriate security technique for database systems and implement temporal/spatial data models for real world applications
CSL601	**Software Engineeirng Lab**
CSL601.1	Identify requirements and apply process models for given case study.
CSL601.2	Analyze and design models for given case study using UML modeling.
CSL601.3	Use software engineering tools for project scheduling
CSL601.4	Develop test cases for the given case study on white box testing.
CSL602	**System Software Lab**
CSL602.1	Design and develop assembler with data structure.
CSL602.2	Design and develop Macro-Processor with data structure.

CSL602.3	Implement the analysis phase of Compiler and use LEX, YACC tools to develop analysis phase.
CSL602.4	Implement synthesis phase of compiler.
CSL603	**Data Warehousing & Mining Lab**
CSL603.1	Implement clustering and classification algorithms on a given data set.
CSL603.2	Implement association rule mining algorithm on a given data set.
CSL603.3	Design data warehouse and perform OLAP operations on a given input.
CSL603.4	Simulate clustering , classification and association mining algorithms using WEKA tool
CSL604	**System Security Lab**
CSL604.1	Analyze and implement symmetric ciphers and RSA public key algorithm.
CSL604.2	Analyze and evaluate performance of hashing algorithms.
CSL604.3	Use network reconnaissance tools to gather information about networks and sniffers, port scanners tools for analyzing packets in a network.
CSL604.4	Detect ARP spoofing using nmap and monitor network packets using wireshark packet sniffer tool .
CSP605	**Mini Project**
CSP605.1	Identify societal, industrial needs and formulate problem statement followed by requirement analysis.
CSP605.2	Design and develop solution using modern tools for the given problem
CSP605.3	Work as an individual; contribute as a team member with effective management skills and ethical values.
CSP605.4	Develop effective communication / technical writing skills through project presentation, Group discussion and report writing activities.
CSC701	**Digital Signal & Image Processing**
CSC701.1	Analyze discrete time signal and discrete time system
CSC701.2	Develop FFT flow graph upto 8 points
CSC701.3	Use the enhancement techniques for digital image processing
CSC701.4	Use the edge detection techniques for digital image processing and develop small projects of 1-D and 2-D Digital Signal Processing.
CSC702	**Mobile Communication & Computing**
CSC702.1	Identify basic concepts and principles in mobile communication & computing, cellular architecture.
CSC702.2	Classify Medium Access, Internet and Transport Layer Protocols in Mobile networking.
CSC702.3	Apply the concepts of WLAN for local as well as remote applications.
CSC702.4	Identify the components of Long-Term Evolution (LTE) architecture.
CSC703	**Artificial Intelligence & Soft Computing**
CSC703.1	Analyze PEAS descriptors of an Intelligent agent.
CSC703.2	Apply an appropriate informed/uninformed/heuristic searching techniques and First Order Predicate logic for problem solving.
CSC703.3	Apply ANN and supervised/unsupervised learning algorithm for real world application.
CSC703.4	Design fuzzy controller system for a given problem.
CSDLO7031	**Advance System Security & Digital Forensics**
CSDLO7031.1	Compare cyber-attacks and apply access control policies, control mechanisms for object projection.
CSDLO7031.2	Identify malicious code, targeted malicious code and detect threats to web applications.
CSDLO7031.3	Determine the vulnerabilities of Wi-Fi networks and apply measures to secure wireless protocols, WLAN and VPN networks.
CSDLO7031.4	Use forensic tools to acquire and duplicate data from compromised systems.
CSDLO7032	**Robotics**
CSDLO7032.1	Determine workspace and specify the characteristics of a Robot
CSDLO7032.2	Analyze direct/ indirect kinematics parameters of a robotic manipulator upto four axis and identify actuators sensor, controller for a robotic application.
CSDLO7032.3	Apply Task Planning and Motion Planning algorithms for a Robotic application
CSDLO7032.4	Apply Robot Vision techniques and develop program for Robotic application.
ILO7013	**Management Information System**
ILO7013.1	Identify the impact of information systems on an organization
ILO7013.2	Use tools and technologies to access database information for improving business performance and decision making
ILO7013.3	Design an IT infrastructure for MIS
ILO7013.4	Identify the Transaction Processing, Functional Area Information and ERP system for enterprise-wide knowledge management
ILO7016	**Cyber Security and Laws**
ILO7016.1	Illustrate the concept of cybercrime, cyber-frauds, cybercriminal types with their motives and relate legal issues with respect to cybercrime.
ILO7016.2	Analyze and discriminate cyberattack types with tools used for attacks.
ILO7016.3	Identify the security challenges presented by mobile devices and infer measures for protecting the same.
ILO7016.4	Discover and apply different aspects of cyber law and Information Security Standards compliance.
ILO7017	**Disaster Management and Mitigation Measures**
ILO7017.1	Illustrate scenario of disaster and its effects in India
ILO7017.2	Compare Manmade and Natural disasters and their extent and possible effects on the economy
ILO7017.3	Outline the Government Policies, acts and administration
ILO7017.4	Employ the knowledge of Institutional Framework for Disaster Management in India
ILO7017.5	Apply the knowledge of Financing and Relief Measures
ILO7017.6	Utilize the knowledge of preventive and mitigation measures to know the simple do's and don'ts in disasters
CSL701	**Digital Signal & Image Processing Lab**
CSL701.1	Apply Convolution, Correlation on discrete time signals
CSL701.2	Implement DFT and FFT on discrete time signals
CSL701.3	Implement spatial domain Image enhancement techniques

CSL701.4	Implement Edge detection techniques using first order derivative filters.
CSL702	**Mobile App.Devlopment Lab**
CSL702.1	Develop communication applications for Bluetooth
CSL702.2	Implement Code Division Multiple Access (CDMA) to test the orthogonality and autocorrelation of a code.
CSL702.3	Develop mobile application using GUI components and database.
CSL702.4	Use GPS location tracking technology in an application.
CSL703	**Artificial Intelligence & Soft Computing Lab**
CSL703.1	Analyze PEAS descriptors of an Intelligent agent.
CSL703.2	Create knowledge base and apply appropriate search techniques used in problem solving.
CSL703.3	Implement Neuron Model and supervised/unsupervised learning algorithm.
CSL703.4	Design fuzzy controller system for a specific problem.
CSL704	**Computational Lab-I (ASSDF)**
CSL704.1	Analyze Static code using open source tools-RATS / Flawfinder and use Nessus to scan Vulnerability
CSL704.2	Analyze security tools to detect web application and browser vulnerabilities
CSL704.3	Use tools to secure wireless networks,routers and mobile devices and perform penetration testing.
CSL704.4	Implement Authentication,access Control using RADIUS /TACACS and use OpenStego tool to detect data hiding or unauthorized file copying.
CSL704	**Computational Lab-I (Robotics)**
CSL704.1	Determine the workspace of a Robot and specify its characteristics
CSL704.2	Analyze kinematics parameters of Robotic Manipulator
CSL704.3	Perform transformation related to Task and Motion planning for a Robot
CSL704.4	Develop algorithm for robot vision techniques and design an expert system
CSP705	**Major Project-I**
CSP705.1	Explore beyond the curriculum to identify problem of society, industrial or research needs; investigate the problem through in-depth literature survey and propose appropriate solution to solve the problem.
CSP705.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
CSP705.3	Analyze and compare the results with the standard results.
CSP705.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
CSP705.5	Write and present their work effectively with ethical values.
CSP705.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
CSC801	**Human Machine Interaction**
CSC801.1	Apply human psychological knowledge of good interfacing in day-to-day activities for HMI.
CSC801.2	Identify the goal directed design guidelines of human centric interface.
CSC801.3	Modify existing interface designs and improve them using design principles.
CSC801.4	Design Human Machine Interaction for social and technical tasks.
CSC802	**Distributed Computing**
CSC802.1	Compare types of distributed system, model and apply RPC, RMI,Object based middleware technologies to develop distributed applications.
CSC802.2	Analyze techniques used for clock synchronization and mutual exclusion.
CSC802.3	Use Resource, Process management, Consistency and Replication Management to improve the performance of distributed system.
CSC802.4	Analyze NFS, AFS distributed file systems
CSDLO8011	**High Performance Computing**
CSDLO8011.1	Identify parallel and pipeline processing approaches
CSDLO8011.2	Design a parallel algorithm for searching problems and compare it with sequential algorithm
CSDLO8011.3	Analyze the performance of parallel computing systems for clusters in terms of execution time, total parallel overhead, speedup
CSDLO8011.4	Develop efficient and high-performance parallel programming using message passing paradigm
CSDLO8012	**Natural Language Processing**
CSDLO8012.1	Identify Challenges of NLP and ambiguities in natural language.
CSDLO8012.2	Apply Morphological analysis approach on given input.
CSDLO8012.3	Apply syntax and semantics analysis by using formal language grammar.
CSDLO8012.4	Design real world NLP applications.
ILO8021	**Project Management**
ILO8021.1	Identify appropriate projects from various options and mention their selection criteria.
ILO8021.2	Prepare Work Break Down Structure for a project and also prepare a schedule using GANTT chart, CPM, PERT
ILO8021.3	Identify opportunities and threats to decide risk response strategy of a project.
ILO8021.4	Apply Earned Value Management techniques to determine & predict status of the project and implement project termination process.
ILO8025	**Professional Ethics and CSR**
ILO8025.1	Use professional ethics to express rights and duties of business also explore professional ethics in the marketplace.
ILO8025.2	Demonstrate professional ethics of consumer protection and job discrimination.
ILO8025.3	Distinguish different aspects of corporate social responsibility.
ILO8025.4	Criticise corporate social responsibility in globalizing India
ILO8026	Research Methodology
CSL801	**Human Machine Interaction Lab**

CSL801.1	Apply human psychological knowledge of good interfacing in day-to-day activities for HMI.
CSL801.2	Design the goal directed human centric interface.
CSL801.3	Modify existing interface designs and improve them.
CSL801.4	Design Human Machine Interaction for social and technical tasks.
CSL802	**Distributed Computing Lab**
CSL802.1	Develop, test and debug RPC/RMI based client-server programs.
CSL802.2	Implement IPC, name resolution and file system components of distributed systems.
CSL802.3	Implement logical and physical clock synchronization techniques.
CSL802.4	Design and implement mutual exclusion algorithm for distributed systems.
CSL803	**Cloud Computing Lab**
CSL803.1	Compare cloud computing services SaaS/PaaS/IaaS for a given application.
CSL803.2	Create and use virtual machine using open source technology.
CSL803.3	Demonstrate service models for SaaS, IaaS and PaaS using Open source technology.
CSL803.4	Use cloud computing software EC2 / Microsoft Azure for cloud application.
CSL804	**Computational Lab-II (HPC)**
CSL804.1	Develop a parallel algorithm to solve a given problem on MPI platform.
CSL804.2	Build the logic to parallelize the programming task.
CSL804.3	Analyze and measure performance of parallel computing systems.
CSL804.4	Design a parallel algorithm for searching/sorting and compare it with sequential algorithm.
CSL804	**Computational Lab-II (NLP)**
CSL804.1	Write programs for text pre-processing on a given input.
CSL804.2	Implement Morphological Analysis of NLP.
CSL804.3	Implement POS tagging and Named Entity Recognition on a suitable input.
CSL804.4	Analyze a case study on NLP application.
CSP805	**Project - II**
CSP805.1	Explore beyond the curriculum to identify problem of society, industrial or research needs; investigate the problem through in-depth literature survey and propose appropriate solution to solve the problem.
CSP805.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
CSP805.3	Analyze and compare the results with the standard results.
CSP805.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
CSP805.5	Write and present their work effectively with ethical values.
CSP805.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.