Vidyavardhini's college of Engineering & Technology Vasai(w)
Department of Computer Engineering
Course Outcomes for R-2012 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 change.

Program Specific Outcomes
PSO1: Analyze problems and design applications of database, networking, security, web technology, cloud computing, machine learning using mathematical skills, and computational tools.
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	
FEC101	**Applied Mathematics I**
FEC101.1	Apply the concepts of Complex Numbers,hyperbolic functions and logarithms to solve engineering problems.
FEC101.2	Solve and Analyze Partial Derivatives and apply it in related field of Engineering.
FEC101.3	Apply principals of basic operations of matrices , rank and echelon form of matrices to solve linear simultaneous equations & Curve Fitting.
FEC101.4	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	Students will be able 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	Students will be able Determine the output of LED, photoconductor and photovoltaic cell applying concepts of semiconductor physics.
FEC102.3	Students will be able Classify dia,Para and Ferro magnetic material based on susceptibility value using qualitative treatment of Langvein and Weiss
FEC102.4	Students will be able Design acoustic of hall/auditorium using reasons for acoustic defects and Select method for production of ultrasonic waves.
FEC103	**Applied Chemistry I**
FEC103.1	Students will be able Analyze the quality of water and suggest methods of treatment.
FEC103.2	Students will be able Illustrate the knowledge of polymers, fabrication methods, conducting polymers in industrial fields.
FEC103.3	Students will be able Apply the knowledge of lubricants, their properties & mechanism to avoid frictional resistance and interpret phase transformations using thermodynamics
FEC103.4	Students will be able Demonstrate knowledge of portland cement.
FEC104	**Engineering Mechanics**
FEC104.1	Students will be able to Illustrate the concept of resultant for different types of force systems and locate the centroid for plane composite lamina.
FEC104.2	Students will be able to Analyse the support reactions, trusses and real life application of friction by using conditions of equilibrium.
FEC104.3	Students will be able to Analyse the motion of particles and rigid bodies by establishing the kinematic relation between displacemnt, velocity and acceleration.
FEC104.4	Students will be able to Analyse body in motion using force and acceleration, work-energy, impulse- momentum principles.
FEC105	**Basic Electrical & Electronics Engineering**
FEC105.1	Students will be able to understand fundamentals of DC circuits and apply knowledge for analyzing network theorems in DC circuits.
FEC105.2	Students will be able to learn the fundamentals and analyze single phase AC circuits and three phase AC circuits.
FEC105.3	Students will able to learn the basic operation and analyze the performance of single-phase transformer.
FEC105.4	Students will be able to Illustrate the concepts of semiconductor devices diode,BJT and its applications(Rectifeir,filter).

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	Students will be 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	Students will be 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	Students will be able to Apply Beta, Gamma functions and D.U.I.S.to evaluate definite integrals.
FEC201.4	Students will be 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	Students will be able to 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
FEC202.2	Students will be able to Calculate critical angle, angle of acceptance, V number, number of modes of propagation, numerical aperture of step index fibre and compare characteristics of images received by photography and holography
FEC202.3	Students will be able to determine non-existence of electrons in the nucleus using uncertainty principle and calculate motion of free particle using time
FEC202.4	Students will be able to Apply concept of electromagnetism in focussing system and CRO
FEC203	Applied Chemistry II
FEC203.1	Students will be able to Illustrate types of corrosion & suggest control measures in industries.
FEC203.2	Students will be able to Analyze the quality of fuel & calculate the oxygen required for combustion of fuel.
FEC203.3	Students will be able to Illustrate composition, properties of alloys & properties & application of composite material.
FEC203.4	Students will be able to Illustrate the principles of green chemistry.
FEC204	Engineering Drawing
FEC204.1	Students will be able Apply the basic principles of projections in Projection of Lines, Planes and Engineering Curves.
FEC204.2	Students will be able Apply the basic principles of projections in Projection of Solids & Section of solids
FEC204.3	Students will be able Visualize the given 3D object and draw Orthographic projections
FEC204.4	Students will be able Draw Isometric view from the given orthographic projections
FEC204.5	Students will be able Draw Orthographic and Isometric Projection using AutoCad
FEC205	Structured Programming Approach
FEC205.1	Students will be able to write an algorithm to support Structure Programming approach.
FEC205.2	Students will be able to use variables, derived data types and control structures to write c program
FEC205.3	Students will be able to use Strings and Functions to solve complex computational problem
FEC205.4	Students will be able to use Pointers, Structure-Union and Files for solving complex computational problem
FEC206	Communication Skills
FEC206.1	Students will be able to develop the ability to understand the importance of communication fundamentals.
FEC206.2	Students will be able to apply techniques to improve oral communication & develop their own speaking style.
FEC206.3	Students will be able to acquire the letter writing skills and produce the letters in any given situation.
FEC206.4	Students will be able to learn all the important aspects of reading including skimming, scanning , note making and understand discourse coherence.
FEL201	Basic Workshop practice-II
FEL201.1	Students will be able to Model different prototypes in the carpentry trade such as Cross cut lap joint, Tee lap joint, Dovetel lap joint.
FEL201.2	Students will be able to Model various basic prototypes in the trade of fitting such as Square, Hexagonal and V Male Female joint.
FEL201.3	Students will be able to Read various basic Layout drawing; make positive and negative film, and perform PCB etching and drilling, Tinning and
FEL201.4	Students will be able to 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	Apply Principles of Vector differentiation and Integral calculus to the analysis of engineering problems.
CSC301.4	Understand complex variables and functions and perform mapping using different techniques.
CSC302	Object Oriented Programming Methodology
CSC302.1	Apply Object Oriented Programming principles and implement the program using Control Structures and Recursion
CSC302.2	Implement the concept of Class, Method, Object, Inheritance in Java.
CSC302.3	Apply the concepts of Interface , Packages, Thread and Exception handling in Java.
CSC302.4	Use AWT and Applet for developing user Interface in Java
CSC303	Data Structures

CSC303.1	Identify data structure suitable to the problem definition
CSC303.2	Demonstrate operations on linear data structures
CSC303.3	Use methods of organizing large amounts of data for non linear data structures.
CSC303.4	Use appropriate searching and/or sorting technique for application development
CSC304	**Digital Logic Design and Analysis**
CSC304.1	Apply logic for the conversion of one number system to other number system and design logic circuits using gates.
CSC304.2	Analyze and design combinational circuits using gates/multiplexers.
CSC304.3	Analyze and design sequential circuits using Flip Flops.
CSC304.4	Analyze framework of VHDL program, CPLD and FPGA.
CSC305	**Discrete Structures**
CSC305.1	Apply set notations and rules of mathematical logic for problem solving.
CSC305.2	Analyze lattices using relation between sets.
CSC305.3	Solve problems based on functions and draw graphs, trees for programming applications.
CSC305.4	Use algebraic structures for groups. And apply codes for Encoding – Decoding.
CSC306	**Electronic Circuits and Communication Fundamentals**
CSC306.1	Analyze the Junction Field Effect Transistor and Compare oscillators, power amplifiers in communication systems.
CSC306.2	Analyze inverting/non-inverting operational amplifiers and their applications and implement them.
CSC306.3	Analyze AM/FM Modulation/Demodulation techniques.
CSC306.4	Compare and analyze Pulse Modulation generation/detection and Multiplexing techniques.
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	Evaluate contour Integration and expand the analytic functions inside circle.
CSC401.4	Solve the problems using various optimization techniques to optimize LPP & NLPP and correlation & regression.
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 method and Dynamic Programming problem solving strategies to solve real world problems.
CSC402.3	Analyze problems on backtracking, branch and bound strategies.
CSC402.4	Analyze strategies for solving problems not solvable in polynomial time and use String Matching Algorithms.
CSC403	**Computer Organization and Architecture**
CSC403.1	Classify different levels in computer systems and apply arithmetic algorithms for solving ALU operations.
CSC403.2	Analyze the data processing operations of central processing and compare RISC/CISC.
CSC403.3	Classify parameters of cache/virtual memory and implement memory mapping techniques.
CSC403.4	Compare I/O modules, 8089 IO processor and Classify data transfer techniques.
CSC404	**Database Management System**
CSC404.1	Demonstrate data models and schemas in database management system
CSC404.2	Design ER/EER model for given case study and relational databases.
CSC404.3	Apply SQL queries for relational databases.
CSC404.4	Use normalization, transaction, concurrency and query processing techniques in database systems
CSC405	**Theoretical Computer Science**
CSC405.1	Apply NFA/DFA techniques for pattern matching
CSC405.2	Apply specified well defined rules for syntax verification
CSC405.3	Analyze and design PDA, Deterministic Turing Machine for formal languages
CSC405.4	Use computability, decidability, undecidability, complexity classes for formal languages.
CSC406	**Computer Graphics**
CSC406.1	Apply scan conversions algorithms to draw point, line, circle, ellipse and scan line, flood fill, boundary fill algorithms to fill the polygon area.
CSC406.2	Apply 2D geometric transformations, viewing and line/polygon clipping algorithms on graphical objects
CSC406.3	Apply 3D geometric transformations, clipping algorithm on graphical objects, construct the curves, and derive the matrix for projection.
CSC406.4	Analyze visible surface detection techniques, illumination models and fractals.
CPC501	**Microprocessor**
CPC501.1	Identify the components and their functions in 16 bit microprocessors.
CPC501.2	Write assembly and Mixed language programs for 8086 microprocessor.
CPC501.3	Design 16-bit 8086 microprocessor based system using memory chips and peripheral chips.
CPC501.4	Classify multicore processors with its advantages
CPC502	**Operating System**
CPC502.1	Identify role of OS in terms of process and synchronization management.
CPC502.2	Use deadlock handling techniques in OS.
CPC502.3	Differentiate algorithms used for memory management.
CPC502.4	Distinguish Unix , Linux and Windows 7 Operating System based on their features.

CPC503	**Structured and Object Oriented Analysis and Design**
CPC503.1	Use different process models for a given application
CPC503.2	Analyze the system requirements and compare traditional approach and object oriented approach.
CPC503.3	Design the system using Unified Modeling Language Tool.
CPC503.4	Build a system using architectural, user interface and component level design techniques
CPC504	**Computer Network**
CPC504.1	Compare different topologies , terminology of computer networking area and types of transmission media.
CPC504.2	Analyze algorithms for error detection,error correction , multiple access control and identify IP Addressing
CPC504.3	Analyze routing algorithms and congestion control algorithms
CPC504.4	Apply sliding Window technique for TCP Flow control and Use HTTP, SMTP, Telnet, FTP, DHCP ,SNMP protocol at application layer.
CPL501	**Web Design Lab**
CPL501.1	Design web pages using appropriate HTML tags and CSS properties.
CPL501.2	Develop web pages using JavaScript and XML.
CPL501.3	Use Kompozer web tool for creating web pages.
CPL501.4	Creating web pages using HTML and PHP server side scripting language
CPL502	**Business Communication And Ethics**
CPL502.1	Develop the interpersonal skills to progress professionally by building stronger relationships
CPL502.2	Write a technical document using precise language, suitable vocabulary and apt style
CPL502.3	Apply the techniques to participate in Group Discussions, Interviews and resume writing for self recruitment.
CPL502.4	Display competence required for professional career growth
CPC601	**System Programming and Compiler Construction**
CPC601.1	Identify the system programs, application programs and describe functioning of systems programs.
CPC601.2	Design the system programs biz assembler,macro-processor,linker and loader
CPC601.3	Design the modules/phases of Compiler.
CPC601.4	Use software tools LEX and YACC for lexical analyzing and parsing.
CPC602	**Software Engineering**
CPC602.1	Select process models for software project development
CPC602.2	Prepare SRS, project plan and manage the change in a software project.
CPC602.3	Design, develop, & validate the quality software project
CPC602.4	Design Web Applications using Software Engineering principles.
CPC603	**Distributed Database**
CPC603.1	Design Distributed database for enterprise applications.
CPC603.2	Identify transaction ,concurrency control and use deadlock recovery management techniques in DDB
CPC603.3	Analyze solutions for query processing and optimization
CPC603.4	Provide solution for heterogeneous databases and use XML for schema integration.
CPC604	**Mobile Communication and Computing**
CPC604.1	Classify cellular, antenna and satellite systems of mobile communication.
CPC604.2	Compare 3G/4G Systems and develop Android application
CPC604.3	Use mobile IP facilities for data communication over telecommunication network.
CPC604.4	Communicate data over wireless LAN and identify security issues in mobile computing.
CPE6012	**Project Management**
CPE6012.1	Identify appropriate projects from various options and mention their selection criteria.
CPE6012.2	Prepare Work Break Down Structure for a project and also prepare a schedule using GANTT chart, CPM, PERT
CPE6012.3	Identify opportunities and threats to decide risk response strategy of a project.
CPE6012.4	Apply Earned Value Management techniques to determine & predict status of the project and implement project termination process.
CPE6013	**Foreigh Language-German**
CPE6013.1	Demonstrate German Language in holistic manner.
CPE6013.2	Assemble and construct the sentences while reading the text, develop the skill of speaking of German Language.
CPE6013.3	Examine the culture, day-to-day life of German family culture.
CPE6013.4	Examine the professional approach using German Language.
CPL601	**Network Programming Laboratory**
CPL601.1	Use Linux commands, networking Commands and Network Configuration Files and Setting up multiple IP addresses on a single LAN.
CPL601.2	Use GUI configuration tools to add/configure Ethernet card and Linux as a router by enabling IP Forwarding.
CPL601.3	Configure Web server/ Email Server and design a Wireless Network using Packet Tracer
CPL601.4	Design and Implement RPC application program .
CPC701	**Digital Signal Processing**
CPC701.1	Classify discrete time signal and perform signal manipulation
CPC701.2	Analyze discrete time system in time domain
CPC701.3	Develop FFT flow graph upto 8 points and Fast DSP algorithms
CPC701.4	Design DSP system for real time signal processing

CPC702	**Cryptography And System Security**
CPC702.1	Use classical encryption techniques for data encryption.
CPC702.2	Evaluate the performance of firewall, SSL and recognize malicious code using firewall
CPC702.3	Apply the cryptographic checksum and message digest algorithms to check data integrity
CPC702.4	Apply ELGAMAL and Schnorr digital signature algorithms to achieve authentication and design secure applications
CPC703	**Artificial Intelligence**
CPC703.1	Analyze PEAS properties and use suitable intelligent agents for given AI applications.
CPC703.2	Choose and apply an appropriate informed / uninformed / heuristic searching technique for solving given problem.
CPC703.3	Apply First Order Predicate logic for logical reasoning and planning problems.
CPC703.4	Identify and Analyze NLP and Expert System AI Application
CPE7023	**Image Processing**
CPE7023.1	Represent the image in jpeg, tiff, png,bmp and video in mpeg-4 format
CPE7023.2	Select spatial domain and frequency domain filtering techniques for image enhancement and perform segmentation.
CPE7023.3	Implement fast image transform flowgraph up to 16 point and perform Binary image processing Operations.
CPE7023.4	Apply image compression & decompression techniques
CPE7025	**Soft Computing**
CPE7025.1	Apply supervised and Unsupervised learning algorithms on a given data set
CPE7025.2	Solve problems on fuzzy sets, fuzzy relations and fuzzy controllers.
CPE7025.3	Identify Neuro Fuzzy Inference System and Classify Derivative based & Derivative free optimization techniques.
CPE7025.4	Apply genetic model on a given data.
CPP701	**Project-I**
CPP701.1	Explore beyond the curriculum to identify problem of society, industrial or research needs; investigate the problem through in-depth literature survey and
CPP701.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
CPP701.3	Analyze and compare the results with the standard results.
CPP701.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
CPP701.5	Write and present their work effectively with ethical values.
CPP701.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
CPL701	**Network Threats and Attack Laboratory**
CPL701.1	Use network based tools WHOIS, dig and nslookup for network analysis.
CPL701.2	Detect ARP spoofing using nmap and monitor network packets using wireshark packet sniffer tool
CPL701.3	Use ARPWATCH and SNORT to simulate intrusion detection system
CPL701.4	Install a firewall and recognize malicious code using firewall.
CPC801	**Data Warehousing And Mining**
CPC801.1	Apply supervised and unsupervised mining algorithms for a given data set
CPC801.2	Analyze the given transactional data and apply appropriate techniques to identify interesting patterns.
CPC801.3	Design a data warehouse for a given application and perform OLAP operations to take business decisions.
CPC801.4	Apply pre-processing techniques for a given data set.
CPC802	**Human Machine Interaction**
CPC802.1	Identify the goal directed design guidelines of human centric interface.
CPC802.2	Apply human psychological knowledge of good interfacing in day-to-day activities for HMI.
CPC802.3	Modify existing interface designs and improve them using design principles.
CPC802.4	Design Human Machine Interaction for social and technical tasks.
CPC803	**Parallel And Distributed System**
CPC803.1	Compare types of distributed system, model and apply RPC, RMI,Object based middleware technologies to develop distributed applications.
CPC803.2	Analyze techniques used for clock synchronization and mutual exclusion.
CPC803.3	Use Resource, Process management, Consistency and Replication Management to improve the performance of distributed system.
CPC803.4	Compare performance and reliability of distributed and parallel programs.
CPE8034	**Digital Forensic**
CPE8034.1	Classify cybercrimes and use incident response methodology to detect incident.
CPE8034.2	Analyze ,extract and classify digital evidences.
CPE8034.3	Investigate and recover evidence using Investigation/Hacker tools.
CPE8034.4	Apply laws of computer forensics for criminal cases.
CPE8031	**Machine Learning**
CPE8031.1	Identify and classify machine learning applications.
CPE8031.2	Apply decision tree algorithm, Bayesian and regression techniques on a given data set
CPE8031.3	Apply linear/non-linear data separation, clustering and dimensionality reduction technique on a given data set.
CPE8031.4	Identify elements of reinforcement learning and classify model based learning with temporal difference.
CPP802	**Project-II**

CPP802.1	Explore beyond the curriculum to identify problem of society, industrial or research needs; investigate the problem through in-depth literature survey and
CPP802.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
CPP802.3	Analyze and compare the results with the standard results.
CPP802.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
CPP802.5	Write and present their work effectively with ethical values.
CPP802.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
CPL801	**Cloud Computing Lab**
CPL801.1	Compare cloud computing services SaaS/PaaS/IaaS for a given application.
CPL801.2	Create and use virtual machine using open source technology.
CPL801.3	Demonstrate service models for SaaS, IaaS and PaaS using Open source technology.
CPL801.4	Use cloud computing software EC2 / Microsoft Azure for cloud application.