

**Vidyavardhini's college of Engineering & Technology Vasai(w)**  
**Department of Information Technology**  
**R 2016**

<b>Program Outcomes</b>	
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 analyse 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 modelling 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.	
<b>Program Specific Outcomes</b>	
1. Graduates will be able to apply and implement IT solutions in allied fields of engineering to solve real word	
2. Graduates will be able to identify social and industrial problems, provide creative solutions and become quality asset	
3. Graduates will be able to deploy secured solution using Information Technology practices and strategies.	
<b>Course Outcomes</b>	
	<b>At the end of the semester student will able to</b>
<b>FEC101</b>	<b>Applied Mathematics I</b>
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.
<b>FEC102</b>	<b>Applied Physics I</b>
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.diffractionmeter application.rotating crystal method & powder method
FEC102.3	Calculate parameters of superconductor viz. Critical temperature, critical magnetic field and differentiate application of superconductor based on Mesinner effect and Josephson effect photovoltaic cell measurements.
FEC102.4	Design acoustic of hall/auditorium using reasons for acoustic defects and Select method for production of ultrasonic waves.capacitors.
<b>FEC103</b>	<b>Applied Chemistry I</b>
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.
<b>FEC104</b>	<b>Engineering Mechanics</b>
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
<b>FEC105</b>	<b>Basic Electrical Engineering</b>
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.
<b>FEC106</b>	<b>Environmental Studies</b>
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.
<b>FEL101</b>	<b>Basic Workshop Practice I</b>
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.
<b>FEC201</b>	<b>Applied Mathematics II</b>
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 3/8 th rule to solve definite integrals numerically 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. to evaluate definite integrals.
FEC201.4	Able to apply double /triple integration to find area, mass, volume and find length of the curve using scilab and rectification method.
<b>FEC202</b>	<b>Applied Physics II</b>
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
<b>FEC203</b>	<b>Applied Chemistry II</b>
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
<b>FEC204</b>	<b>Engineering Drawing</b>
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
<b>FEC205</b>	<b>Structured Programming</b>
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.
<b>FEC206</b>	<b>Communication Skills</b>
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
<b>FEL201</b>	<b>Basic Workshop II</b>
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.
<b>ITC301</b>	<b>Applied Mathematics III</b>
ITC301.1	Apply the Set theory, Relation and functions concepts for application in hand.
ITC301.2	Apply Laplace transform & Inverse Laplace transform to different applications.
ITC301.3	Examine the probability of events by applying the permutations and combinations.
ITC301.4	Understand complex variables and functions and perform mapping using different techniques
<b>ITC302</b>	<b>Logic Design</b>
ITC302.1	Illustrate the concepts of various components to design stable analog circuits
ITC302.2	Calculate represent numbers and perform arithmetic operations.
ITC302.3	Design it using logic gates and combinational circuits, minimize the Boolean expression using Boolean algebra
ITC302.4	Design and develop sequential circuits
<b>ITC303</b>	<b>Data Structures &amp; Analysis</b>
ITC303.1	Illustrate criteria for defining algorithm and to discover the complexities associated with of algorithms.
ITC303.2	Identify linear data structures (Arrays, Linked Lists, Stacks and Queue) and Experiment data structure operations on it.
ITC303.3	Use searching and sorting algorithms.
ITC303.4	Identify non-linear data structures (Trees and Graphs) and experiment data structure operations on it.
<b>ITC304</b>	<b>Database Management System</b>
ITC304.1	Understand the features of RDBMS and design the conceptual model of database using ER modelling for real life application
ITC304.2	Create RDBMS with constraints and keys and retrieve any type of information from database by using SQL and Relational algebra
ITC304.3	Analyze the existing design of database schema and apply concept of normalization to design an optimal database
ITC304.4	Build indexing mechanism for efficient retrieval of information from the database
<b>ITC305</b>	<b>Principles of Communications</b>
ITC305.1	Differentiate analogue and digital communication systems and identify different types of noise occurred, its minimization and able to apply Fourier analysis.
ITC305.2	Design/construct generation and detection of AM, DSB, SSB, FM transmitter and receiver.

ITC305.3	Apply sampling theorem to quantify the fundamental relationship between channel bandwidth, symbol rate and bit rate, explain line coding techniques.
ITC305.4	Describe Electromagnetic Radiation and discuss propagation of waves.
<b>ITL301</b>	<b>Digital Design Lab</b>
ITL301.1	Illustrate the Boolean algebra and design it using logic gates
ITL301.2	Calculate and Realize given function using combinational circuit.
ITL301.3	Design and Analyze combinational circuit.
ITL301.4	Design and Analyze sequential circuits and PLD
<b>ITL302</b>	<b>Data Structure Lab</b>
ITL302.1	Demonstrate data structure operations on Linked List.
ITL302.2	Use and explain stack and queue data structures.
ITL302.3	Compare sorting algorithms.
ITL302.4	Experiment data structure operations on trees and graph.
<b>ITL303</b>	<b>SQL Lab</b>
ITL303.1	Select an appropriate problem definition for real life problem and construct a database for the same
ITL303.2	Design conceptual models of a database using ER modeling for real life applications construct queries in Relational Algebra.
ITL303.3	Construct queries in SQL to retrieve any type of information from a data base. OR Create and populate a RDBMS, using SQL.
ITL303.4	Implement indexes for a database using techniques like B or B+ trees.
<b>ITL304</b>	<b>Java Programming Lab</b>
ITL304.1	Students will be able to identify social problems and design programming solution using object oriented concepts.(Create)
ITL304.2	Students will be able to manipulate strings using String class and regular expressions(apply)
ITL304.3	Students will be able to demonstrate use of collections framework(apply)
ITL304.4	Students will be able to access database to perform CRUD operations(apply)
<b>ITC401</b>	<b>Applied Mathematics IV</b>
ITC401.1	Apply the Number Theory, graphs and trees concepts to different applications using theorem
ITC401.2	Apply probability theory and find statistical measures for discrete and continuous random variables.
ITC401.3	Perform data analysis using sampling theory and correlation
ITC401.4	Apply group's theory & Lattice theory for coding
<b>ITC402</b>	<b>Computer Networks</b>
ITC402.1	Differentiate between OSI and TCP/IP model.
ITC402.2	Explain the functions of Application layer and Presentation layer paradigms and Protocols and describe the Session layer design issues and transport layer protocol.
ITC402.3	Classify the routing protocols and analyze how to assign the IP addresses for the given network, describe the functions of data link layer.
ITC402.4	Explain the types of transmission media with real time applications.
<b>ITC403</b>	<b>Operating Systems</b>
ITC403.1	Apply the knowledge of basic structure, functioning of operating systems and compare various operating systems using the knowledge of different file systems.
ITC403.2	Identify problems related to process management, IPC and synchronization and apply learned methods to solve basic problems on preemptive and non-preemptive scheduling algorithms.

ITC403.3	Examine cause and effect related to deadlocks, I/O manager and analyze them related to common circumstances in operating systems.
ITC403.4	Apply the knowledge of basics of memory management techniques, the use of virtual memory in modern operating systems.
<b>ITC404</b>	<b>Computer Organization And Architecture</b>
ITC404.1	Identify basic structure of computer for performing computer arithmetic operations.
ITC404.2	Examine computer arithmetic operation and design memory organization for different word size operations.
ITC404.3	Illustrate the concepts of cache mapping techniques and I/O organization.
ITC404.4	Implement instruction level parallelism.
<b>ITC405</b>	<b>Automata Theory</b>
ITC405.1	Illustrate regular language, expression and Grammar and design different types of finite automata
ITC405.2	Illustrate context free language expression and Grammar and design different types of Push down automata
ITC405.3	Design different types of Turing Machine
ITC405.4	Categorize languages and design different types of machine as acceptor, verifier and translator
<b>ITL401</b>	<b>Networking Lab</b>
ITL401.1	Execute and evaluate network administration commands and demonstrate their use in different network scenarios.
ITL401.2	Demonstrate the installation and configuration of network simulator and measure different network scenarios and their performance behaviour
ITL401.3	Analyse the packet contents of different protocol using wireshark.
ITL401.4	Implement the socket programming for client and server architecture and design and set up an organization network using packet tracer.
<b>ITL402</b>	<b>Unix Lab</b>
ITL402.1	Identify basic Unix general purpose commands.
ITL402.2	Change the ownership and file permissions using advanced Unix commands.
ITL402.3	Use the awk, grep, perl scripts.
ITL402.4	Implement shell scripts and SED.
ITL402.5	Apply basic administrative tasks.
ITL402.6	Apply Unix networking commands.
<b>ITL403</b>	<b>Microprocessor Programming Lab</b>
ITL403.1	Build a program on a microprocessor using arithmetic & logical instruction set of 8086.
ITL403.2	Develop the assembly level programming using 8086 loop instruction set.
ITL403.3	Design programs based on string and procedure for 8086 microprocessor.
ITL403.4	Analyze abstract problems and apply a combination of hardware and software to address the Problem
<b>ITL404</b>	<b>Python Lab</b>
ITL404.1	Students will be able to design solution using python(create)
ITL404.2	Students will be able to manipulate strings using String class and regular expressions(apply)
ITL404.3	Students will be able to demonstrate use of collections framework(apply)
ITL404.4	Students will be able to access database to perform CRUD operations(apply)
<b>ITC501</b>	<b>Microcontroller and Embedded Programming</b>
ITC501.1	Illustrate the Embedded system concepts and Architecture of embedded system.
ITC501.2	Implement basic programs using Microcontroller 8051.



ITC501.3	Examine basic components of ARM processor for real time applications.
ITC501.4	Design conceptual embedded system using RTOS.
<b>ITC502</b>	<b>Internet Programming</b>
ITC502.1	Design Web site and Web Application using HTML, CSS, Javascript and also design Responsive web site using HTML5 and CSS3.
ITC502.2	Design Rich Internet Application using AJAX Programming Technique, JSON and design dynamic web site using PHP and MYSQL.
ITC502.3	Examine web Extensions and Web services.
ITC502.4	Design Web application using Python web Framework-Django
<b>ITC503</b>	<b>Advanced Data Management Technology</b>
ITC503.1	Design alternate path for query execution and provide security to avoid any type of security incidents.
ITC503.2	Apply concept of transaction and perform Database Recovery.
ITC503.3	Design distributed database and object-oriented database system.
ITC503.4	Organize Strategic data in an enterprise and built dataware house and analyze data using OLAP operations, to take strategic decisions.
<b>ITC504</b>	<b>Cryptography &amp; Network Security</b>
ITC504.1	Identify and apply network security basics and classical encryption techniques.
ITC504.2	Compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication.
ITC504.3	Evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
ITC504.4	Analyze different attacks and evaluate the performance of firewalls, security protocols.
<b>ITDL5011</b>	<b>Advanced Data Structure &amp; Analysis of Algorithm</b>
ITDL5011.1	calculate complexity of algorithms including recursive algorithms and apply divide and conquer approach to solve problems.
ITDL5011.2	choose appropriate advanced data structure for given problem.
ITDL5011.3	apply the greedy programming technique to solve the problems.
ITDL5011.4	apply the dynamic programming technique to solve the problems and to apply pattern matching algorithm for given problem.
<b>ITDL5012</b>	<b>Image Processing</b>
ITDL5012.1	Explain the fundamental concepts of image processing and use different Image enhancement techniques.
ITDL5012.2	Illustrate and apply image transforms.
ITDL5012.3	Analyze the basic algorithms used for image compression with morphological image processing and Image Segmentation and Representation.
ITDL5012.4	Synthesize Color image processing and its real world applications.
<b>ITDL5013</b>	<b>E-Commerce &amp; E-Business</b>
ITDL5013.1	Differentiate E-Commerce Websites and specify the hardware and software technologies.
ITDL5013.2	Choose appropriate payment systems for E-Commerce.
ITDL5013.3	Develop the process of selling and marketing on web using the concept of E-Business and its Models.
ITDL5013.4	Examine E-Business strategies.
<b>ITL501</b>	<b>Internet Programming Lab</b>

ITL501.1	Design Web site and Web Application using HTML5, CSS3 to demonstrate responsive web design and implement web pages with validation using Javascript objects by applying event handling mechanism.
ITL501.2	Design Rich Internet Application using AJAX Programming Technique and JSON and design web application using PHP and MYSQL.
ITL501.3	Build well-inform XML Document and implement web services using Java.
ITL501.4	Design Web application using Python web Framework-Django
<b>ITL502</b>	<b>Security Lab</b>
ITL502.1	Apply the knowledge of symmetric cryptography to implement simple ciphers.
ITL502.2	Analyse and implement public key algorithms like RSA and El Gamal.
ITL502.3	Analyse and evaluate performance of hashing algorithms.
ITL502.4	Explore different network reconnaissance tools to gather information about networks.
ITL502.5	Explore and use different tools like sniffers, port scanners for analysing packets in a network.
ITL502.6	Analyse firewalls, intrusion detection systems and explore email security.
<b>ITL503</b>	<b>OLAP Lab</b>
ITL503.1	design complex queries using SQL and apply concept of transaction and recovery.
ITL503.2	measure query costs and design alternate efficient paths for query execution.
ITL503.3	design distributed databases and apply advanced models like mobile, spatial databases.
ITL503.4	design enterprise data and organize data to perform analysis and take strategic decisions.
<b>ITL504</b>	<b>IoT (Mini Project) Lab</b>
ITL504.1	Identify the requirements for the real world problems and illustrate the problem solution as per the requirements.
ITL504.2	Examine and select appropriate software and hardware components for project.
ITL504.3	Construct the hardware circuit using hardware components, implement the code and test.
ITL504.4	Demonstrate to work in teams and illustrate the conduct of research study.
<b>ITL505</b>	<b>Business Communication &amp; Ethics</b>
ITL505.1	Develop the interpersonal skills to progress professionally by building stronger relationships
ITL505.2	Design a technical document using precise language, suitable vocabulary and apt style
ITL505.3	Apply the techniques to participate in Group Discussions, Interviews and resume writing for self recruitment.
ITL505.4	Display competence required for professional career growth
<b>ITC601</b>	<b>Software Engineering with Project Management</b>
ITC601.1	illustrate software development life cycle, select process models, apply techniques to collect requirements and apply estimation techniques to estimate project cost and effort.
ITC601.2	construct design model from requirement model.
ITC601.3	demonstrate testing concepts, software quality assurance and configuration management
ITC601.4	illustrate the concepts of project management like risk management, project scheduling and tracking
<b>ITC602</b>	<b>Data Mining and Business Intelligence</b>
ITC602.1	Apply the concepts of data exploration, preprocessing, and data visualization tools to get the data ready for application of data mining algorithms.
ITC602.2	Apply data mining algorithms on large datasets to get the patterns which can be used as a knowledge.
ITC602.3	Choose appropriate data mining algorithm by analyzing metrics to measure their performance.
ITC602.4	Evaluate performance of data mining algorithms for practical problems and Apply BI to make strategic decisions.



<b>ITC603</b>	<b>Cloud Computing &amp; Services</b>
ITC603.1	Students will be able to commercially Evaluate various platrforms for deployment of solution(evalute)
ITC603.2	Students will be able to create virtualized platform to deploy solution(create)
ITC603.3	Students will be able to analyze Openstack as inhouse cloud solution provider(analyze)
ITC603.4	Students will be able to deploy solution over commercial cloud platform.(apply)
<b>ITC604</b>	<b>Wireless Networks</b>
ITC604.1	Explain the basic concepts of wireless network and examine wireless generations
ITC604.2	Demonstrate the different wireless technologies and Appraise the importance of Ad-hoc and Wireless Sensor networks
ITC604.3	Compare the emerging wireless technologies standards analyze the design considerations for deploying the wireless network infrastructure
ITC604.4	Differentiate security measures, standards, services and layer wise security considerations
<b>ITDLO6023</b>	<b>Digital Forensic</b>
ITDLO6023.1	Identify need of digital forensic and role of digital evidences.
ITDLO6023.2	Identify methodology of incident response for security issues and digital forensic tools for data collection.
ITDLO6023.3	Apply the knowledge of IDS to secure network (devices router, firewall) and network analysis.
ITDLO6023.4	Select the method to generate legal evidence and supporting investigation reports.
<b>ITL601</b>	<b>Soft. Design Lab</b>
ITL601.1	define a system/problem, write its requirement specifications and construct ER diagram
ITL601.2	design structural model
ITL601.3	design behavioral model
ITL601.4	estimate project cost, define project schedule and use a project management tool
<b>ITL602</b>	<b>Business Intelligence Lab</b>
ITL602.1	Apply the concepts of data exploration, preprocessing, relevant data mining techniques and data visualization tools.
ITL602.2	Use relevant supervised and unsupervised techniques of data mining to conceptualize a DM solution.
ITL602.3	Apply concept of frequent patterns, how and when data mining can be used as a problem-solving technique in business context.
ITL602.4	Acquire hands-on experience in using conventional data mining software, build a BI application and evaluate its strength and limitations.
<b>ITL603</b>	<b>Cloud Service Design Lab</b>
ITL603.1	Students will be able to Evaluate various virtualization platrforms for deployment of solution(evalute)
ITL603.2	Students will be able to create inhouse cloud with Openstack(create)
ITL603.3	Students will be able to demonstrate deployment of solution over google cloud platform.(apply)
ITL603.4	Students will be able to demonstrate deployment of solution over AWS cloud platform.(apply)
<b>ITL604</b>	<b>Sensor Network Lab</b>
ITL604.1	Identify the requirements for the real-world problems. Examine literatures in the preferred field of study.
ITL604.2	Appraise software/ hardware skills
ITL604.3	Construct project successfully by infusing hardware/sensor requirements, coding, emulating, and testing.
ITL604.4	Summarize the study conducted and assemble in teams to work in the preferred domain


<b>ITM605</b>	<b>Mini-Project</b>
ITM605.1	Explore beyond the curriculum to identify problem of society, industrial or research needs.
ITM605.2	Investigate the problem through in-depth literature survey and propose appropriate solution to solve the problem.
ITM605.3	Choose appropriate modern tools and plan/implement the proposed solution with effective utilization of the resources available.
ITM605.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
ITM605.5	Write and present their work effectively with ethical values.
ITM605.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
<b>ITC701</b>	<b>Enterprise Network Design</b>
ITC701.1	Analyze the customer requirements and Apply a Methodology to Network Design(Analyze)
ITC701.2	Design Basic Campus and Data Center Network.(create)
ITC701.3	Design IP Addressing and Select suitable Routing Protocols for the Network(create)
ITC701.4	Analyse Software defined networks for problems in hand.(analyze)
<b>ITC702</b>	<b>Infrastructure Security</b>
ITC702.1	Understand the concept of vulnerabilities, attacks and discover protection mechanisms available
ITC702.2	Analyze and evaluate software vulnerabilities and attacks on databases and operating systems
ITC702.3	Relate the need of security protocols in wireless communication and identify security solutions in Web and Cloud infrastructure
ITC702.4	Examine attacks on Open Web Applications / services and outline appropriate security policies to protect infrastructure components
<b>ITC703</b>	<b>Artificial Intelligence</b>
ITC703.1	Illustrate the basic building blocks of AI required for constructing intelligent agents for toy problems.
ITC703.2	Illustrate the basic building blocks of AI required for constructing intelligent agents for toy problems.
ITC703.3	Infer decisions, develop applications including expert systems using logic language and also use certain & uncertain knowledge & reasoning
ITC703.4	construct solutions using planning & learning methods.
<b>ITDLO7034</b>	<b>Software Testing and Quality Assurance</b>
ITDLO7034.1	Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs for quality improvement.
ITDLO7034.2	Analyze and apply different software testing methodologies and techniques for general and specialized environments.
ITDLO7034.3	Examine software quality by designing accurate test plan and managing test process.
ITDLO7034.4	Automate test processes to improve quality and get familiar with quality assurance models.
<b>ITDLO7035</b>	<b>Soft Computing</b>
ITDLO7035.1	apply fuzzy logic concepts, fuzzy principles and relations and design fuzzy controller
ITDLO7035.2	demonstrate the basic architecture of ANN, apply Learning Algorithms and use ANN as function approximation
ITDLO7035.3	illustrate Genetic Algorithm and its applications to soft computing.
ITDLO7035.4	illustrate Hybrid system,its usage, application and optimization
<b>ILO7016</b>	<b>Cyber Security &amp; Laws</b>

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.
<b>ITL701</b>	<b>Network Design Lab</b>
ITL701.1	To demonstrate configuration of Cisco IOS using Packet tracer(apply)
ITL701.2	Design Basic Campus using Cisco packet Tracer.(create)
ITL701.3	Design network by configuration of Routing algorithms(creata)
ITL701.4	Demonstrate SDN using Openflow.(apply)
<b>ITL702</b>	<b>Adv. Security Lab</b>
ITL702.1	Interpret AAA using RADUIS and TACACS
ITL702.2	Implement and analyze, program and database vulnerabilities Buffer overflow and SQL Injection.
ITL702.3	Explore and analyze different security tools to secure mobile devices, web browser, wireless network, and router
ITL702.4	Explore reconnaissance, attack, and forensics tools in Kali Linux
<b>ITL703</b>	<b>Intelligence System Lab</b>
ITL703.1	Illustrate the building blocks of an Intelligent Agent using PEAS representation .
ITL703.2	Illustrate the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.
ITL703.3	Infer develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
ITL703.4	Construct real life problem domains using logic based techniques and use this to perform inference or planning.
<b>ITL704</b>	<b>Android App Dev. Lab</b>
ITL704.1	Students will be able to identify social problems and design android application using android studio.(Create)
ITL704.2	Students will be able to develop front end applications that will communicate with backend platform(create)
ITL704.3	Students will be able to demonstrate use of various APIs for communicating with with other applications(apply)
ITL704.4	Students will be able to access database to perform CRUD operations(apply)
<b>ITM705</b>	<b>Project 1</b>
ITM705.1	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.
ITM705.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
ITM705.3	Analyze and compare the results with the standard results.
ITM705.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
ITM705.5	Write and present their work effectively with ethical values.
ITM705.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
<b>ITC801</b>	<b>Big Data Analysis</b>

ITC801.1	Demonstrate an ability to use frameworks like Hadoop, NOSQL to efficiently store retrieve and process Big Data for Analytics.
ITC801.2	Implement several Data Intensive tasks using the Map Reduce Paradigm
ITC801.3	Apply mining techniques on streaming data big data analytics.
ITC801.4	Apply mining techniques on static data for big data analytics.
<b>ITC802</b>	<b>Internet of Everything</b>
ITC802.1	Illustrate the concepts of IoT and Identify the different technologies.
ITC802.2	Design applications using RFID.
ITC802.3	Examine protocols used in IoT and design smart city application in IoT.
ITC802.4	Examine data received through sensors in IoT.
<b>ITDLO8044</b>	<b>Robotics</b>
ITDLO8044.1	Determine the basic concepts of Robots and specify the concepts of Kinematics of Robotics.
ITDLO8044.2	Analyse the Motions, velocities and dynamic analysis of force and evaluate Motion planning.
ITDLO8044.3	Apply the concepts of Trajectory Planning
ITDLO8044.4	Apply the concepts of Potential Functions, Visibility Graphs and Coverage Planning
<b>ILO8021</b>	<b>Project Management</b>
ILO8021.1	Identify appropriate projects from various options and mention their selection criteria.
ILO8021.2	Develop Work Breakdown Structure to prepare the schedule for the project
ILO8021.3	Identify and predict the opportunities and threats and to decide various strategic approaches to deal with projects.
ILO8021.4	Evaluate project performance using Earned value Technique and Prepare a final report considering analysis, Success and failures for the project.
<b>ILO8023</b>	<b>Entrepreneurship Dev. &amp; Management</b>
ILO8023.1	Student will be able to create a business plan with technical and commercial details(create)
ILO8023.2	Interpret key regulations and legal aspects of entrepreneurship in India and apply appropriately to given business.(apply)
ILO8023.3	Student will be able to employ government policies for promotion of business.(apply)
ILO8023.4	Student will be able to select funding option for given business plan(evaluate)
<b>ITL802</b>	<b>Internet of Everything Lab</b>
ITL802.1	Identify the requirements for the real work problems and illustrate the components used for making hardware.
ITL802.2	Construct the hardware circuit using hardware components, implement the code and test.
ITL802.3	Examine the findings of the study conducted in the preferred domain.
ITL802.4	Demonstrate to work in teams and illustrate the conduct of research study.
<b>ITL803</b>	<b>DevOps Lab</b>
ITL803.1	To demonstrate deployment of applications using containers like docker and kubernetes
ITL803.2	to demonstrate version control using git
ITL803.3	To build, deploy and test software using jenkins
ITL803.4	to automate infrastructure management and configuration control using Ansible
<b>ITL804</b>	<b>R Programming Lab</b>
ITL804.1	Write simple R programs and use functionality of R with add-on packages.
ITL804.2	Import data files and perform various data manipulation tasks on data from imported files.
ITL804.3	Use statistical functions in R on data extracted from data files and visualize results of various statistical operations using R Graphics and Tables.

ITL804.4	Perform data analytics on real life application data set by applying R knowledge.
<b>ITM805</b>	<b>Project 2</b>
ITM805.1	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.
ITM805.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
ITM805.3	Analyze and compare the results with the standard results.
ITM805.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
ITM805.5	Write and present their work effectively with ethical values.
ITM805.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.



  
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