

Criterion 1 - Curricular Aspects

1.1.1 - Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which are reflected in Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the various Programmes offered by the Institution:

Program code	Programme name	Website link
UG-CH	Chemical Engineering	https://mitaoe.ac.in/mitaoe-school-of-chemical-engineering-course-structure.php
UG-CV	Civil Engineering	https://mitaoe.ac.in/school-of-civil-engineering-course.php
UG-CS	Computer Engineering	https://mitaoe.ac.in/school-of-computer-engineering-and-technology-comp-bachelor-course-structure.php
UG-EX	Electronics Engineering	https://mitaoe.ac.in/school-of-electrical-engineering-etx-course-structure.php
UG-ET	Electronics and Telecommunication Engineering	https://mitaoe.ac.in/btech-electronics-and-telecommunication-engineering-course-structure.php
UG-IT	Information Technology*	*From the academic year (2021-22) UG-Bachelor of Technology (B Tech) Information Technology is merged to UG-Bachelor of Technology (B Tech) Computer
UG-ME	Mechanical Engineering	https://mitaoe.ac.in/school-of-mechanical-engineering-course
UG-BD	Design (B. Des)	https://www.mitsd.edu.in/institute.php#visionmission
PG-CS	Computer Engineering	https://mitaoe.ac.in/school-of-computer-engineering-and-technology-mtech-couse-structure.php
PG-ME	Mechanical Engineering	https://mitaoe.ac.in/school-of-mechanical-engineering-MTech-course.php
PG-EX	Electronics Engineering	https://mitaoe.ac.in/school-of-electrical-engineering-etx-course-structure.php



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UG-ET	Electronics and Telecommunication Engineering	https://mitaoe.ac.in/btech-electronics-and-telecommnication-engineering-course-structure.php
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PG-ME	Mechanical Engineering	https://mitaoe.ac.in/school-of-mechanical-engineering-MTech-course.php
PG-EX	Electronics Engineering	https://mitaoe.ac.in/school-of-electrical-engineering-etx-course-structure.php

MIT Academy of Engineering, Alandi(D.), Pune – 412 105

Course Outcomes (2019 – 2023 Pattern)

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MIT Academy of Engineering, Alandi(D.), Pune

List of Program Outcomes Given By NBA

PO No.	PO Statement
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 team work: 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 ones 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.

MIT Academy of Engineering, Alandi(D.), Pune

List of Program Specific Outcomes

PSO No.	PSO Statement
Department :- Chemical Engineering	
PSO1	Evaluate and identify separation process for the system.
PSO2	Apply the knowledge of unit operations and unit processes for design the chemical plant.
PSO3	Evaluate the energy scenario & environment related issues in Chemical Plants.
Department :- Civil Engineering	
PSO1	Analyze, Design, Construct, Maintain and Operate infrastructure projects.
PSO2	Assess the environmental impact of various projects and required measures to curb environmental deterioration.
PSO3	Able to use latest software pertaining to various streams of Civil Engineering.
Department :- Computer Engineering	
PSO1	Logic Building: Participate in Planning, Implementing and evaluating language – specific team programming solutions to specific application in system programming, networking, databases and machine intelligence.
PSO2	Application development skill: Complete individual practical experiences in a variety of programming languages and situations for solving real life problems.
PSO3	Competency Development: Develop the IT competencies using knowledge, skills and disposition to prepare or global workplace.
Department :- Electronics Engineering	
PSO1	Design building blocks of real time applications and automation by using modern engineering tools and multidisciplinary concepts
PSO2	Build confidence to participate and succeed in competitive examinations and technical competitions.
PSO3	Broaden the knowledge in various administrative skill sets, exposure to entrepreneurial setup and society outreach program as a whole
Department :- Electronics and Telecommunication Engineering	
PSO1	Analyze and simulate diverse problems in the field of communication.
PSO2	Design and analyze a system with applications in signal and image processing.
PSO3	Build, test and evaluate an embedded system with real time constraints.
PSO4	Design and implement a system towards automatic control in varied engineering problems.
Department :- Information Technology	
PSO1	Logic Building: Participate in Planning, Implementing and evaluating language – specific team programming solutions to specific application in system programming, networking, databases and machine intelligence.
PSO2	Application development skill: Complete individual practical experiences in a variety of programming languages and situations for solving real life problems.
PSO3	Competency Development: Develop the IT competencies using knowledge, skills and disposition to prepare or global workplace.
Department :- Mechanical Engineering	
PSO1	To apply design and development principles to provide solutions in Machine Design, Production Technology, Thermal Engineering and CAD-CAM domain to meet desired needs.
PSO2	To apply competency and proficiency in the field of allied engineering.

Course Outcomes

First Year, B. Tech.

(Common To All Programmes)

(2019 – 2023)



CO's	CO Statement	BT Level
First Year, BTech (Common To All Programmes)		
Course Name and Course Code		Calculus And Differential Equations (AS105)
AS105.CO.1	Solve First order and First degree ordinary differential equations	L2
AS105.CO.2	Analyze and solve real world phenomenon governed by First order ordinary differential equations	L4
AS105.CO.3	Apply concepts of linear differential equations of second and higher order to solve systems in engineering world	L3
AS105.CO.4	Infer the problems based on properties of partial differentiation	L3
AS105.CO.5	Examine the applications of partial differentiation.	L4
AS105.CO.6	Solve and examine the solution of partial differential equations by theoretical methods	L3
Course Name and Course Code		Statistics and Integral Calculus (AS107)
AS107.CO.1	Analyze and evaluate statistical problems	L4
AS107.CO.2	Solve the probability distribution problems	L3
AS107.CO.3	Evaluate complex integrals	L3
AS107.CO.4	Sketch curves by analyzing the given equation of curves	L3
AS107.CO.5	Evaluate the multiple integrals	L4
AS107.CO.6	Apply the knowledge of multiple integrals to solve engineering problems	L3
Course Name and Course Code		Engineering Physics (AS106)
AS106.CO.1	Evaluate the importance of order of all physical quantities and compare the order of size of different objects	L6, L4
AS106.CO.2	Apply the theoretical knowledge of optics to understand the physics behind engineering applications	L3
AS106.CO.3	Apply that light is transverse in nature	L3
AS106.CO.4	Demonstrate the necessity of quantum mechanics and the distinction between the domains of classical and quantum mechanics	L3, L2
AS106.CO.5	Evaluate and apply the Schrdingers equation to the motion of an electron orbiting round the shell	L6
AS106.CO.6	Apply the concepts of Quantum Physics in different branches of engineering	L4
Course Name and Course Code		Science of Nature (CH101)
CH101.CO.1	Explain natural biological processes and their technical aspects in view of optimizing Engineering solutions	L1
CH101.CO.2	Explain important inventions that changed the human life and their impact on engineering.	L3
CH101.CO.3	Apply the basic knowledge of chemistry to solve the engineering problems.	L3
CH101.CO.4	Categorize the different engineering materials and to solve engineering problems.	L3
CH101.CO.5	Apply basic concepts of analytical techniques for analysis of various chemical compounds	L3
CH101.CO.6	Identify different methodologies for water quality analysis for industrial applications.	L4

CO's	CO Statement	BT Level
Course Name and Course Code		Application Programming - Python (CS102)
CS102.CO.1	Debug syntax and semantics in Python programs.	L2
CS102.CO.2	Demonstrate proficiency in handling strings and file system.	L3
CS102.CO.3	Implement the programs using core data structures like Lists and Dictionaries.	L3
CS102.CO.4	Interpret the concepts of Object Oriented Programming in Python.	L4
CS102.CO.5	Develop solution for real life problems using Python.	L4
Course Name and Course Code		LOGIC DEVELOPMENT - USING C PROG (CS101)
CS101.CO.1	List the various data types, control structures and looping structures supported by C language	L1
CS101.CO.2	Diferentiate between various data types supported by C language.	L2
CS101.CO.3	Implement the solutions for various algorithms in C language.	L3
CS101.CO.4	Analyze various parameter passing methods to functions in C language.	L4
Course Name and Course Code		Applied Mechanics (CV102)
CV102.CO.1	Determine the resultant and support reactions.	L3
CV102.CO.2	Equilibrium Analysis of bodies involving frictional forces.	L4
CV102.CO.3	Evaluate Centroid of bodies and moment of inertia of sections.	L3
CV102.CO.4	Identify the type of motion and its kinematic parameters.	L3
CV102.CO.5	Analyze the motion under action of constant and variable forces.	L4
CV102.CO.6	Apply energy and momentum methods for kinetics problems.	L4
Course Name and Course Code		Engineering Graphics (ME104)
ME104.CO.1	Develop and/or comprehend a simple engineering drawing in both First and Third angle orthographic projections.	L1
ME104.CO.2	Interpret engineering drawings.	L2
ME104.CO.3	Apply visualization skills to development of surfaces.	L3
ME104.CO.4	Analyze engineering drawings.	L3
ME104.CO.5	Decide annotations for two dimensional drawings.	L2
ME104.CO.6	Create manual drawing & CAD data using SP46 standards.	L4
Course Name and Course Code		Experimental Tools and Techniques (ME105)
ME105.CO.1	Recall the tools required for the measurements.	L2
ME105.CO.2	Summarize the application of various engineering tools used.	L2
ME105.CO.3	Identify the right tools for selected purpose.	L3
ME105.CO.4	Inspect various parts of the system.	L4
ME105.CO.5	Justify the most appropriate technique which can be compatible with the existing environment.	L5
ME105.CO.6	Develop the system which will give appropriate solution to the identified problem.	L6

CO's	CO Statement	BT Level
Course Name and Course Code		Electrical and Electroincs Engineering (EX102)
EX102.CO.1	Develop Renewable energy system (PV) & power factor improvement circuits.	L3
EX102.CO.2	Distinguish behavior of three phase circuits & power measurement methods.	L2
EX102.CO.3	Analyze analog circuits.	L4
EX102.CO.4	Design Digital circuits.	L4
EX102.CO.5	Demonstrate the use of Instrumentation system in various fields.	L6
EX102.CO.6	Identify electrical machines used in typical domestic and industrial sector Application.	L4
Course Name and Course Code		English for Engineers (HP103)
HP103.CO.1	Interpret texts written in English.	L2, L5
HP103.CO.2	Apply English grammar rules correctly.	L3
HP103.CO.3	Choose and employ appropriate words from AWL and NAWL in communication.	L3, L6
HP103.CO.4	Develop sentence and text in English coherently and formally.	L3, L6
HP103.CO.5	Demonstrate overall improvement in communication skills.	L2
HP103.CO.6	Analyze and infer from written, audio and video texts.	L2, L4
Course Name and Course Code		Design Thinking (ME106)
ME106.CO.1	Recall fundamental principles of design thinking.	L1
ME106.CO.2	Explain all the dimensions of user and his needs using design thinking approach.	L2
ME106.CO.3	Outline user centric problem by using information gathering techniques.	L2
ME106.CO.4	Compare multiple solutions through ideation process.	L2
ME106.CO.5	Interpret most appropriate solution for defined user centric problem.	L2
ME106.CO.6	Develop the most optimum solution.	L3

Course Outcomes

B. Tech

(Chemical Engineering)

(2019 – 2023)



COs	CO Statement	BT Level
Second Year, BTech (Chemical Engineering)		
SEMESTER - III		
Course Name and Course Code :- Material Engineering (ME221)		
ME221.CO1	Relate the applications of various engineering materials and heat treatment processes in material processing industry.	L2
ME221.CO2	Interpret the specifications, composition, concepts and fundamental properties of engineering materials applied in industrial/research field	L3
ME221.CO3	Select the suitable materials, manufacturing process for specified application to meet the product performance requirements within its product service life.	L3
ME221.CO4	Analyze the suitable material testing and characterization technique to ensure service life for specific product without any failure or deterioration in its	L4
Course Name and Course Code :- Material and Energy Balance (CH221)		
CH221.CO1	Interpret the data presented in different unit systems	L3
CH221.CO2	Apply the various gas laws to calculate the unknowns in the given system	L3
CH221.CO3	Develop the material balance equation for the given system	L3
CH221.CO4	Analyze the heating value of the given fuel	L4
CH221.CO5	Calculate the heat of reaction for the given reaction at the specific conditions	L3
CH221.CO6	Calculate the energy requirement for the given system	L3
Course Name and Course Code :- Inorganic and Analytical Chemistry (CH222)		
CH222.CO1	Predict the geometry of various chemical compounds	L2
CH222.CO2	Appreciate the importance and applications of transition metals and coordination compounds in our day to day life.	L2
CH222.CO3	Describe Colligative properties of solutions and correlate these with molar masses of the solutes	L3
CH222.CO4	Describe the basic principle of different analytical techniques.	L3
CH222.CO5	Suggest possible analytical techniques for identification and quantification of organic compounds	L3
CH222.CO6	Apply the knowledge of various Biomolecules used in biochemical processes	L3
Course Name and Course Code :- Momentum transfer (CH223)		
CH223.CO1	Apply concepts of momentum transfer to different processes in chemical engineering.	L3
CH223.CO2	Find out the dimensions of unknown variable by using dimensional analysis.	L3
CH223.CO3	Calculate pressure drop by setting momentum balance.	L3
CH223.CO4	Perform design calculations related to flow measurements and pumping of fluids.	L3
CH223.CO5	Calculate different losses in piping.	L3
CH223.CO6	Apply the equation of motion.	L3

COs	CO Statement	BT Level
Course Name and Course Code :- Chemical Engineering Thermodynamics (CH224)		
CH224.CO1	State the importance of thermodynamic laws and their applications in chemical engineering	L2
CH224.CO2	Evaluate the thermodynamic properties of pure substances as well as mixtures	3
CH224.CO3	Apply the knowledge of thermodynamics in chemical engineering problems	L3
CH224.CO4	Use appropriate thermodynamic models to predict the equilibrium characteristics of a system	L3
CH224.CO5	Implement knowledge of heat cycles in day to day applications	L3
CH224.CO6	Evaluate the feasibility of a reaction using thermodynamic concepts	L5
Course Name and Course Code :- Rapid Prototyping (ET235)		
ET235.CO1	Consolidate the techniques, skills & modern engineering tools.	L2
ET235.CO2	Apply acquired skills to the construction of a prototype project.	L3
ET235.CO3	Develop a prototype project by performing tasks in team.	L3
ET235.CO4	Demonstrate the work carried out in a team.	L3
Course Name and Course Code :- Minor Project - Design (CH230)		
CH230.CO1	Delineate the problem to be solved	L2
CH230.CO2	Comprehend the paramount of the health, safety and welfare of the public in the practice of engineering profession	L3
CH230.CO3	Embark project planning and design	L2
CH230.CO4	Inculcate problem solving skills and critically analyze the options available to solve the problem	L2
CH230.CO5	Cognize the importance of documentation and report writing	L2
Course Name and Course Code :- Environmental Science (CV203)		
CV203.CO1	Summarize the importance of ecosystem and biodiversity for maintaining ecological balance.	L2
CV203.CO2	Identify environmental problems arising due to engineering and technological activities and the science behind those problems of engineering profession	L2
CV203.CO3	Categorize the major pollutants along with sources and abatement devices for the environmental management.	L2
CV203.CO4	Perceive the social and professional responsibility towards the environment	L2
SEMESTER - IV		
Course Name and Course Code :- Applied Mathematics (AS203)		
AS203.CO1	Evaluate the Laplace and Inverse Laplace transform and will solve the differential equations	L3
AS203.CO2	Rewrite the periodic and non-periodic functions as a series of sines and cosines	L3
AS203.CO3	Differentiate a vector valued function in plane or space.	L3
AS203.CO4	Solve and compute the area and volume of the objects	L3
AS203.CO5	Apply the numerical methods to problems of calculus and differential equations.	L3
AS203.CO6	Execute the program codes using MATLAB.	L3

COs	CO Statement	BT Level
Course Name and Course Code :- Heat Transfer (CH231)		
CH231.CO1	Identify the different modes of heat transfer and use the conduction calculations for various geometries	L3
CH231.CO2	Apply the principles of convection for thermal systems	L3
CH231.CO3	Implement the concepts of heat transfer with phase changes	L2
CH231.CO4	Analyze the systems involving radiation and to solve problems pertaining to them	L4
CH231.CO5	Analyze different types of heat exchangers based on fundamental concepts	L4
CH231.CO6	Develop the basic designs of heat transfer equipment	L5
Course Name and Course Code :- Advanced Chemistry (CH232)		
CH232.CO1	Predict the rates of given chemical and photochemical processes	L3
CH232.CO2	Recognize how the MSDS improves your access to vital safety, health, and environmental information about chemicals used in the workplace	L2
CH232.CO3	Apply adsorption & catalysis technique for purification & unit processes.	L3
CH232.CO4	Predict the mechanism of given organic reaction	L3
CH232.CO5	Interpret spectral data and identify unknown compounds	L3
CH232.CO6	Interpret the thermograms, analyze and present the result of the measurements	L3
Course Name and Course Code :- Mass Transfer (CH233)		
CH233.CO1	Calculate the molar flux for different systems	L3
CH233.CO2	Determine the individual and overall transfer coefficients	L3
CH233.CO3	Use the Psychrometric chart for humidification operations	L3
CH233.CO4	Analyze the drying rate of the given material	L4
CH233.CO5	Develop the equilibrium data for crystallization operation	L5
CH233.CO6	Design equipment for various mass transfer operations	L6
Course Name and Course Code :- Professional Communication (HP202)		
HP202.CO1	Express themselves effectively in routine and real-world interactions through oral and written communication.	L2
HP202.CO2	Show Confident Public Speaking skills	L2
HP202.CO3	Showcase leadership qualities during tough tasks, make decisions and actions effectively within time	L2
Course Name and Course Code :- Digital Prototyping (ET224)		
ET224.CO1	Consolidate the techniques, skills & modern engineering tools	L2
ET224.CO2	Apply acquired skills to the construction of a prototype project	L3
ET224.CO3	Develop a prototype project by performing tasks in team	L3
ET224.CO4	Demonstrate the work carried out in a team	L3

COs	CO Statement	BT Level
Course Name and Course Code :- Minor Project - Implementation (CH240)		
CH240.CO1	Select appropriate method for making of solution	L2
CH240.CO2	Compare various engineering tools/technique to develop solution	L4
CH240.CO3	Justify the selected method/tools opted for making of solution	L4
CH240.CO4	Develop tangible solution to defined problem	L3
CH240.CO5	Test the developed solution	L3
CH240.CO6	Document solution in the form of Project report / IPR drafts	L2
Course Name and Course Code :- Liberal Learning (HP203)		
HP203.CO1	Develop a skill in the domain of their interest	L3
HP203.CO2	Demonstrate the skills learnt in the course	L2
HP203.CO3	Apply the concepts learnt in real-life situations	L3

COs	CO Statement	BT Level
Third Year, B.Tech (Chemical Engineering)		
SEMESTER - V		
Course Name and Course Code :- Chemical Engineering Operations (CH341)		
CH341.CO1	Explain parts of equipments used in Solid-solid, solid-fluid separation	L2
CH341.CO2	Distinguish between various solid transportation equipments	L4
CH341.CO3	Calculate power requirement for various equipments with laws	L3
CH341.CO4	Classify size reduction, mixing and solid-fluid separation equipments	L4
CH341.CO5	Calculate pressure drop across solid- fluid systems	L3
CH341.CO6	Select appropriate equipments for solid-solid and solid-fluid separation	L3
Course Name and Course Code :- Separation Process (CH342)		
CH342.CO1	Generate the vapor - liquid equilibrium data for the given system	L3
CH342.CO2	Perform material balance for batch and continuous distillation	L3
CH342.CO3	Calculate the mass transfer coefficient for the different system	L3
CH342.CO4	Analyze the effectiveness of the given separation column	L4
CH342.CO5	Perform material balance calculations for different types of extraction units	L3
CH342.CO6	Design equipment for various separation process	L6
Course Name and Course Code :- Chemical Reaction Engineering (CH343)		
CH343.CO1	Identify different reaction types and mechanisms	L3
CH343.CO2	Classify the various reactor types and their applications	L4
CH343.CO3	Apply rate equations to determine the kinetic parameters of a reaction	L3
CH343.CO4	Compare the behavior of different reaction order systems	L4
CH343.CO5	Analyze the data obtained for different reactor systems	L4
CH343.CO6	Design a reactor based on the reaction kinetic data	L6
Course Name and Course Code :- Process Engineering (CH351)		
CH351.CO1	Relate the role of process engineer	L2
CH351.CO2	Implement the appropriate symbol in process diagram	L3
CH351.CO3	Correlate the devices in process designing	L3
CH351.CO4	Calculate the process synthesis and equipmen	L3
CH351.CO5	Evaluate the data for process development	L5
CH351.CO6	Design the process equipment as per given requirement	L6
Course Name and Course Code :- Energy Engineering (CH352)		
CH352.CO1	Describe the conventional and renewable energy sources	L3
CH352.CO2	Illustrate the various applications of each form of energy	L3
CH352.CO3	Utilize the energy conversion tools appropriately	L2
CH352.CO4	Discover a system based on non-conventional energy sources	L2

COs	CO Statement	BT Level
Course Name and Course Code :- Project Management (HP304)		
HP304.CO1	Identify the Project Management Knowledge Areas and Processes	L2
HP304.CO2	Classify the responsibilities while designing the Project Master Plan	L3
HP304.CO3	Outline the Cost Estimating and Cost Escalation Process	L3
HP304.CO4	Demonstrate and highlight The Processes of Project Quality Management	L3
HP304.CO5	Analyze Project Management Maturity and Maturity Models	L4
Course Name and Course Code :- Skill Development Lab (CFD) (CH344)		
CH344.CO1	Use a CAD tool for preparing CFD specific CAD models	L3
CH344.CO2	Create high quality CFD simulation meshes from imported CAD geometry	L3
CH344.CO3	Complete a basic CFD simulation including defining the problem, calculating the solution and post-processing the results	L3
CH344.CO4	Learn to interpret the results by qualitative and quantitative post-processing	L2
CH344.CO5	Perform all steps of a CFD simulation from CAD import to meshing to solution to results	L3
CH344.CO6	Perform a flow and heat transfer simulation	L3
Course Name and Course Code :- Project Design (CH345)		
CH345.CO1	Delineate the problem to be solved	L2
CH345.CO2	Inculcate problem solving skills by critically analyzing real world needs, possible solutions and challenges	L3
CH345.CO3	Carry out systematic literature review, planning and project design	L3
CH345.CO4	Cognize the importance of documentation and report writing	L3
SEMESTER - VI		
Course Name and Course Code :- Process Dynamics and Control (CH361)		
CH361.CO1	Experiment transfer functions of different systems and their response required for stability analysis.	L3
CH361.CO2	Categorize controller tuning for stable systems in chemical process plants	L3
CH361.CO3	Apply various software's used for control systems	L3
CH361.CO4	Identify multiple loops and use the computers in process control in chemical process industries.	L3
CH361.CO5	Compare stable & unstable systems by Bode Stability criterion	L4
CH361.CO6	Evaluate control system for various process operations	L3
Course Name and Course Code :- Chemical Equipment Design - I (CH362)		
CH362.CO1	Describe the basics of process equipment design and important parameters of equipment design.	L3
CH362.CO2	Design different types of pressure vessels.	L6
CH362.CO3	Apply the complete knowledge of equipment fabrication and testing methods.	L3
CH362.CO4	Implement the various codes and standards used for equipment design.	L3
CH362.CO5	Find out the suitable material of construction, fabrication methods for various process equipment.	L3
CH362.CO6	Apply their knowledge for designing of process equipment	L3

COs	CO Statement	BT Level
Course Name and Course Code :- Chemical Process Technology (CH363)		
CH363.CO1	Classify chemical industries	L2
CH363.CO2	Interpret manufacturing Flowsheet	L3
CH363.CO3	Recognize specification of different raw material and its importance	L3
CH363.CO4	Evaluate effect of operating parameter on quality	L5
CH363.CO5	Apply appropriate parameters for process selection	L3
CH363.CO6	Interpret major engineering problems associated with process	L4
Course Name and Course Code :- Process Modelling and Simulation (CH371)		
CH371.CO1	Construct mathematical model and exercise model building procedure for steady and unsteady processes	L2
CH371.CO2	Formulate material, energy and momentum balance equations for chemical processes	L3
CH371.CO3	Develop mathematical model for heat and mass transfer operations	L3
CH371.CO4	Formulate model for chemical reactor systems	L3
CH371.CO5	Simulate the model using numerical techniques and software	L3
CH371.CO6	Optimize the various parameters to enhance the efficiency of the process	L4
Course Name and Course Code :- Energy Analysis and Modeling (CH372)		
CH372.CO1	Understand energy analysis	L2
CH372.CO2	Design wind energy systems	L3
CH372.CO3	Understand concept of nuclear energy	L2
CH372.CO4	Apply various modeling techniques for energy systems	L3
CH372.CO5	Apply various simulation tools for energy systems	L3
CH372.CO6	Understand optimization tools for energy applications	L2
Course Name and Course Code :- Employability Skills (HP305)		
HP305.CO1	Relate the importance of Employability Career Development	L2
HP305.CO2	Build necessary, specific professional skills	L3
HP305.CO3	Analyze the environment of employability	L4
HP305.CO4	Develop various techniques of effective team building in their professional life	L3
Course Name and Course Code :- Skill Development Lab (ASPEN ONE) (CH364)		
CH364.CO1	Identify the operation/process required to solve an engineering problem	L2
CH364.CO2	Match calculation with computer simulation	L3
CH364.CO3	Apply the knowledge of chemical engineering basics to computational techniques	L3
CH364.CO4	Categorize different types of equipments based upon application	L3
CH364.CO5	Assess complex chemical engineering problems	L4
CH364.CO6	Evaluate a chemical engineering process/plant	L5

COs	CO Statement	BT Level
Course Name and Course Code :- Project Implementation (CH365)		
CH365.CO1	Analyze techniques, algorithms and design process related to the project	L4
CH365.CO2	Infer conclusions by implementing/developing/experimenting/simulating/testing the different techniques/processes	L3
CH365.CO3	Cognize the importance of documentation and report writing	L3

COs	CO Statement	BT Level
Final Year, B. Tech (Chemical Engineering)		
SEMESTER - VII		
Course Name and Course Code : Equipment Design and Costing (CH461)		
CH461.CO1	Apply the concept for designing storage vessel.	L3
CH461.CO2	Analyze key criteria involved for the heating system used in reaction vessel.	L3
CH461.CO3	Apply knowledge about the designing tray column used in chemical processes.	L3
CH461.CO4	Design the Piping for Equipment.	L6
CH461.CO5	Design of packed column.	L6
CH461.CO6	Demonstrate the cost estimating process	L3
Course Name and Course Code :- Petroleum Refining Technology (CH483)		
CH483.CO1	Apply characteristics of crude oil for classification and separation	L3
CH483.CO2	Analyze the importance of pre refining operation	L4
CH483.CO3	Interpret specification and test methods for fuel	L3
CH483.CO4	Identify processes used in refinery with its importance	L3
CH483.CO5	Build Hydrogen and sulphur production Flowsheet	L2
CH483.CO6	Interpret Lube oil and Bitumen production Flowsheet and specification	L3
Course Name and Course Code : Petroleum Refining Technology (CH484)		
CH484.CO1	Identify basics of Biology and Overview of Biotechnology	L3
CH484.CO2	Model cell and enzyme kinetics	L2
CH484.CO3	Apply methods of immobilization	L3
CH484.CO4	Illustrate sterilization methods	L2
CH484.CO5	Inspect Bio-product Recovery & Bio-separations, Manufacture of Biochemical Products	L3
CH484.CO6	Design, Analysis and Stability of Bioreactors	L3
Course Name and Course Code :- Environmental Engineering (CH485)		
CH485.CO1	Understand the importance of environment and environmental standards	L2
CH485.CO2	Identify the sources of Air pollution & suggest the steps to mitigate air pollution	L3
CH485.CO3	Specify control devices for air pollution	L3
CH485.CO4	Calculate BOD / COD for a given composition of effluent stream	L3
CH485.CO5	Identify tools and techniques for tertiary waste water treatment	L3
CH485.CO6	Predict the different strategies for solid waste management	L3

COs	CO Statement	BT Level
Course Name and Course Code : Process Intensification and Integration (CH471)		
CH471.CO1	Apply the concept of process integration and intensification	L3
CH471.CO2	Interpret the pinch analysis and methodology	L3
CH471.CO3	Apply process integration approach to given process	L3
CH471.CO4	Identify bottlenecks in process for minimization of energy requirements	L3
CH471.CO5	Design optimal process route	L6
CH471.CO6	Synthesize the reactor with given process requirements	L3
Course Name and Course Code :- Skill Development Lab (Aspen EDR) (CH463)		
CH463.CO1	Identify the operation/process required to solve an engineering problem.	L3
CH463.CO2	Match manual calculation with computer simulation.	L3
CH463.CO3	Apply the knowledge of chemical engineering basics to computational techniques.	L3
CH463.CO4	Categorize different types of equipment's based upon application.	L3
CH463.CO5	Assess complex chemical engineering problems.	L3
CH463.CO6	Design a chemical engineering process/plant.	L5
SEMESTER - VIII		
Course Name and Course Code :- Plant Design and Piping (CH461)		
CH461.CO1	Identify the operation/process required to solve an engineering problem.	L3
CH461.CO2	Complete conceptual or preliminary plant design	L3
CH461.CO3	Match manual calculation with simulation outcomes.	L3
CH461.CO4	Design a piping layout and construction.	L6
CH461.CO5	Apply the knowledge of chemical engineering basics to computational techniques.	L3
CH461.CO6	Assess complex industrial refineries problems.	L4
Course Name and Course Code :- Petrochemical Technology (CH493)		
CH493.CO1	Understand Indian and world scenario for production and demand for Petrochemical	L3
CH493.CO2	Understand specification of different raw material and its importance	L3
CH493.CO3	Select proper unit operation and processes in synthesis of various Petrochemicals	L3
CH493.CO4	Interpret the petrochemical Flowsheet and its major engineering problems	L6
CH493.CO5	Select proper process from available process	L3
CH493.CO6	Understand uses of petrochemicals product	L4

COs	CO Statement	BT Level
Course Name and Course Code :- Bio Process Technology (CH494)		
CH494.CO1	Identify role of bioprocess engineering	L3
CH494.CO2	Select Appropriate Bioreactor Configurations and Operation	L3
CH494.CO3	Interpret preliminary design for a bioreactor	L3
CH494.CO4	Compare which unit operations are required before and after a bioreactor	L4
CH494.CO5	Develop block flow diagram and process flow diagram for bioprocesses	L3
CH494.CO6	Analyze kinetics of cell growth	L4
Course Name and Course Code :- Chemical Plant safety (CH495)		
CH495.CO1	Apply the basic principles of safety	L3
CH495.CO2	Develop the roots for hazard analysis	L3
CH495.CO3	Identify the event tree and fault tree analysis	L3
CH495.CO4	Analyze the hazards in a given process and assess them to provide solutions for operating safely	L4
CH495.CO5	Knowledge to choose the safety requirements for storage and handling of a given chemical	L3
CH495.CO6	Formulate the important of risk factors	L2
Course Name and Course Code :- Engineering Economics (HP405)		
HP405.CO1	Understand the basic concepts of engineering economics	L2
HP405.CO2	Apply the economic approach in firm/organization under different market conditions	L3
HP405.CO3	Summarize the bank structures and schemes	L3
HP405.CO4	Use the effective way of financial budget and skills	L3

Course Outcomes

B. Tech

(Civil Engineering)

(2019 – 2023)



CO's	CO Statement	BT Level
Second Year, BTech (Civil Engineering)		
Course Name and Course Code		Material Engineering (ME221)
ME221.CO.1	Relate the applications of various engineering materials and heat treatment processes in material processing industry.	L3
ME221.CO.2:	Interpret the specifications, composition, concepts and fundamental properties of engineering materials applied in industrial/research field	L2
ME221.CO.3:	Select the suitable materials, manufacturing process for specified application to meet the product performance requirements within its product service life.	L4
ME221.CO.4:	Analyze the suitable material testing and characterization technique to ensure service life for specific product without any failure or deterioration in its performance.	L4
Course Name and Course Code		Geotechnical Engineering (CV204)
CV204.CO.1	Grade engineering properties of soil based on index property by performing relevant experiments.(Evaluate)	L5
CV204.CO.2	Calculate seepage and flow net. (Apply)	L3
CV204.CO.3	Choose suitable method for improvement in soil characteristics. (Evaluate)	L5
CV204.CO.4	Apply basic soil mechanics principle to calculate various stresses induced in soil. (Apply)	L3
CV204.CO.5	Calculate the stability of slope. (Apply)	L3
CV204.CO.6	Evaluate bearing capacity of different types of soils. (Evaluate)	L5
Course Name and Course Code		Building Design & Construction (CV205)
CV205.CO.1	Design functionally a single/multi-storied building for various components of residential/commercial units.	L4
CV205.CO.2	Implement relevant bye laws in functional design of buildings in a prescribed locality in India.	L2
CV205.CO.3	Select suitable types of basic building material and masonry used for construction of various types of buildings	L1
CV205.CO.4	Explain various components of buildings namely forms of doors, roofs, doors, windows, arches, lintels, staircases.	L2
CV205.CO.5	Select suitable type of formwork and scaffolding.	L1
CV205.CO.6	Describe green building concept and Rating Systems.	L2

CO's	CO Statement	BT Level
Course Name and Course Code		Mechanics of Solids (CV206)
CV206.CO.1	Enlist and explain different types of actions on a structural component[Understand].	L2
CV206.CO.2	Draw axial force diagrams for axially loaded members, shear force diagrams and bending moment diagrams for statically determinate beams and twisting moment diagram for statically determinate shafts[Apply].	L3
CV206.CO.3	Draw bending stress distribution diagram for beams and shear stress distribution diagrams for beams and shafts. [Apply].	L3
CV206.CO.4	Calculate load corresponding to elastic instability for columns with various end conditions[Apply].	L3
CV206.CO.5	Calculate principal stresses and absolute maximum shear stresses at various locations of a structural component using analytical method and Mohrs circle whichever is suitable[Analyse].	L4
CV206.CO.6	Select particular shape of cross section to economically carry calculated bending/shear stresses under flexure/shear[Evaluate]	L5
Course Name and Course Code		Minor Project- Design (CV230)
ME230.CO.1:	Delineate the problem to be solved.	L1
ME230.CO.2:	Comprehend the paramount of the health, safety and welfare of the public in the practice of engineering profession.	L2
ME230.CO.3	Embark project planning and design.	L1
ME230.CO.4	Inculcate problem solving skills and critically analyze the options available to solve the problem.	L3
ME230.CO.5	Cognize the importance of documentation and report writing.	L2
Course Name and Course Code		Skill Development Course 1 - REVIT (CV232)
CV232.CO.1	Describe building information modeling methodology and its benefits	L2
CV232.CO.2	Draw all Architectural components.	L3
CV232.CO.3	Design detail views, add 3D and 2D elements and detail components.	L4
CV232.CO.4	Create construction documentation.	L4
Course Name and Course Code		Environmental Science (CV203)
CV203.CO.1:	Summarize the importance of ecosystem and biodiversity for maintaining ecological balance.	L2
CV203.CO.2:	Identify environmental problems arising due to engineering and technological activities and the science behind those problems.	L2
CV203.CO.3:	Categorize the major pollutants along with sources and abatement devices for the environmental management.	L3
CV203.CO.4:	Perceive the social and professional responsibility towards the environment.	L1

CO's	CO Statement	BT Level
Course Name and Course Code		Applied Mathematics (AS203)
AS203.CO.1	Evaluate the Laplace and Inverse Laplace transform and will solve the differential equations.	L2
AS203.CO.2	Rewrite the periodic and non-periodic functions as a series of sines and cosines.	L1
AS203.CO.3	Differentiate a vector valued function in plane or space.	L2
AS203.CO.4	Solve and compute the area and volume of the objects.	L3
AS203.CO.5	Apply the numerical methods to problems of calculus and differential equations.	L3
AS203.CO.6	Execute the program codes using MATLAB	L2
Course Name and Course Code		Mechanics of fluids (CV214)
CV214.CO.1	Interpret the properties and behavior of the fluid at rest and in motion.	L2
CV214.CO.2	Utilize equations of motion for various flow conditions and compute discharge of the flows	L3
CV214.CO.3	Analyze laminar and turbulent flows through pipes considering the losses.	L4
CV214.CO.4	Evaluate various parameters related to the flow around immersed bodies.	L5
CV214.CO.5	Explain different terms related to open channel flow along with critical flow.	L3
CV214.CO.6	Analyze the different types of open channel flow using various governing equations.	L4
Course Name and Course Code		Surveying and Geospatial Engineering (CV215)
CV215.CO.1	Apply the techniques of levelling to solve engineering problems.	L3
CV215.CO.2	Interpret and implement the principles of trigonometry for surveying using standardized methods.	L2
CV215.CO.3	Perform traversing and triangulation by implementing the basic principles of surveying.	L3
CV215.CO.4	Construct different types of curves for alignment of roads and railways and lay out civil engineering structure on field.	L3
CV215.CO.5	Record and interpret spatial data and perform analysis by using modern surveying tools	L3
CV215.CO.6	Analyze field data to minimize errors using mathematical models.	L4
Course Name and Course Code		Structural Analysis (CV216)
CV216.CO.1	Determine internal forces in structure and sketch deflected shapes.	L3
CV216.CO.2	Determine displacements of determinate structures.	L3
CV216.CO.3	Analyse indeterminate structures by force methods.	L4
CV216.CO.4	Analyse indeterminate structures by displacements methods.	L4
CV216.CO.5	Analyse determinate structures for moving loads.	L4
CV216.CO.6:	Estimate the collapse load for indeterminate structures.	L5

CO's	CO Statement	BT Level
Course Name and Course Code		Rapid Prototyping (ET235)
ET235.CO.1	Consolidate the techniques, skills and modern engineering tools	L5
ET235.CO.2	Apply acquired skills to the construction of a prototype project	L3
ET235.CO.3	Develop a prototype project by performing tasks in team.	L6
ET235.CO.4	Demonstrate the work carried out in a team.	L3
Course Name and Course Code		Minor Project - Implementation (CV240)
ME240.CO.1	Select appropriate method for making of solution.	L1
ME240.CO.2	Compare various engineering tools/technique to develop solution.	L2
ME240.CO.3	Justify the selected method/tools opted for making of solution.	L2
ME240.CO.4	Develop tangible solution to de□fined problem.	L3
ME240.CO.5	Test the developed solution.	L2
ME240.CO.6	Document solution in the form of Project report / IPR drafts.	L2
Course Name and Course Code		Professional Skills (HP202)
HP202.CO.1	Express themselves effectively in routine and real-world interactions through verbal and	L2
HP202.CO.2	Show confident Public Speaking skills.	L3
HP202.CO.3	To showcase leadership qualities during tough tasks, make decisions and actions effectively within time.	L3

CO's	CO Statement	BT Level
Third Year, BTech (Civil Engineering)		
Course Name and Course Code		Concrete Technology (CV305)
CV305.CO.1	Describe different type's concrete ingredients with their properties.	L1
CV305.CO.2	Illustrate properties of concrete using various IS tests.	L3
CV305.CO.3	Produce a concrete with specific mix.	L4
CV305.CO.4	Explain special types of concrete techniques.	L2
CV305.CO.5	Describe different concrete related equipment.	L2
CV305.CO.6	Analyze Methods of Concrete Repair.	L3
Course Name and Course Code		Drinking Water & Sanitary Engineering (CV306)
CV306.CO.1	Analyze the characteristics of water and wastewater.	B4
CV306.CO.2	Estimate the quantity of drinking water and domestic wastewater generated.	B3
CV306.CO.3	Design the various units of water treatment plant.	B4
CV306.CO.4	Summarize the advancement in water distribution system.	B2
CV306.CO.5	Design the various units of sewerage treatment plant.	B4
Course Name and Course Code		Design of steel structures (CV307)
CV307.CO.1	Explain the various design philosophies	L2
CV307.CO.2	Design connections of structural elements for the actions they are subjected to, using limit state method.	L4
CV307.CO.3	Design axially loaded steel elements using Limit state method.	L4
CV307.CO.4	Design steel elements subjected to bending and shear using Limit state method.	L4
Course Name and Course Code		Construction Planning and Management (CV325)
CV325.CO.1	Relate various project managerial and planning concepts with onsite work.	L2
CV325.CO.2	Analyze the technique of project scheduling & network analysis	L4
CV325.CO.3	Utilize the methods of project controlling & inventory management	L4
CV325.CO.4	Contrast on earned value management with administrative incentive schemes	L4
CV325.CO.5	Illustrate various concepts and methods for quality and safety management	L2
CV325.CO.6	Functionally design a schedule for a residential building	L4

CO's	CO Statement	BT Level
Course Name and Course Code		Solid waste management (CV326)
CV326.CO.1	Describe the functional elements of a solid waste management system.	L1
CV326.CO.2	Identify the methods of collection, storage and transportation of solid waste.	L2
CV326.CO.3	Evaluate recovery, treatment and disposal alternatives according to properties of solid	L2
CV326.CO.4	Understand basic concepts in hazardous waste management and integrated waste man-	L2
CV326.CO.5	Recognize the relevant smart techniques for collection, transport disposal of waste.	L1
CV326.CO.6	Acquire knowledge on waste to energy productions in the perspective of sustainable development..	L3
Course Name and Course Code		Project Management (CS361)
CS361.CO.1	Identify the Project Management Knowledge Areas and Processes.	
CS361.CO.2	Classify the responsibilities while designing the Project Master Plan.	
CS361.CO.3	Outline the Cost Estimating and Cost Escalation Process.	
CS361.CO.4	Demonstrate and highlight The Processes of Project Quality Management.	
CS361.CO.5	Analyze Project Management Maturity and Maturity Models.	
Course Name and Course Code		Skill Development Course 2-ETABS (CV342)
CV304.CO.1	Prepare structural framing plan. [Applying]	3
CV304.CO.2	Assigning material properties, boundary conditions and loading to structural elements. [Applying]	3
CV304.CO.3	Analyze the R.C. and steel structures for various load combinations. [Analysis]	4
Course Name and Course Code		Mini Project - Design (CV350)
CV350.CO.1	Delineate the problem to be solved.	L1
CV350.CO.2	Inculcate problem solving skills by critically analyzing real world needs, possible solutions and challenges.	L2
CV350.CO.3	Carry out systematic literature review, planning and project design.	L2
CV350.CO.4	Cognize the importance of documentation and report writing.	L3
Course Name and Course Code		Design of Reinforced Concrete Structures (CV312)
CV312.CO.1	Describe the concept of elastic, ultimate, working stress and limit state method of design for reinforced concrete structures.	L1
CV312.CO.2	Design one way, two way, rectangular slab, singly and doubly reinforced Rectangular beam and flanged beam by Limit State Method.	L2
CV312.CO.3	Design RC members for combined bending shear and torsion using Limit State	L3
CV312.CO.4	Design short columns for various conditions.	L3
CV312.CO.5	Design axially and eccentrically loaded rectangular footing.	L4

CO's	CO Statement	BT Level
Course Name and Course Code		Transportation Engineering (CV313)
CV313.CO.1	Explain basic transportation planning process.	L2
CV313.CO.2	Design systems for traffic operations.	L4
CV313.CO.3	Design highway geometry.	L4
CV313.CO.4	Design bituminous mixes.	L4
CV313.CO.5	Explain basics of bridge engineering.	L2
CV313.CO.6	Demonstrate use of BIS, IRC & MORTH codes.	L3
Course Name and Course Code		Water Resources Engineering (CV314)
CV314.CO.1	Analyze hydro-meteorological data.	L2
CV314.CO.2	Estimate reservoir capacities, and yield.	L4
CV314.CO.3	Design irrigation canals and canal network.	L3
CV314.CO.4	Estimate aquifer parameters.	L4
CV314.CO.5	Apply system analysis techniques and solve complex problems in water resources Engineering	L3
CV314.CO.6	Develop rainfall-runoff relationship hydrological models.	L3
Course Name and Course Code		Operation Research (CV332)
CV332.CO.1	Solve the optimization problems based on real scenario.	L3
CV332.CO.2	Apply Linear programming for minimizing the project cost and maximizing its profit.	L3
CV332.CO.3	Apply LPP to Transportations problems & solve assignment problems in an easy way.	L3
CV332.CO.4	Make decision of replacing for suitable outcome using assignment modeling & games theory.	L4
CV332.CO.5	Examine the real conditions of a project so that loss can be avoided.	L5
CV332.CO.6	Organize an appropriate order of operations to service facilities.	L3
Course Name and Course Code		Unit operations and Processes in Effluent Treatment (CV333)
CV333.CO.1	Identify and solve complex engineering problems.	L2
CV333.CO.2	Suggest and apply the suitable treatment processes for Industrial Effluent same in the field application.	L2
CV333.CO.3	Design various unit processes for effluent treatment.	L3
CV333.CO.4	Identify and assess the characteristics of effluent water along with their environmental impacts.	L2
Course Name and Course Code		Skill Development Course - 3 OpenRoad Designer (CV343)
CV343.CO.1	Demonstrate use of basic functions of OpenRoad Designer.	L2
CV343.CO.2	Model terrain using total station data in OpenRoad Designer Environment.	L4
CV343.CO.3	Create horizontal & vertical alignment.	L4
CV343.CO.4	Create 3D model of 2 / 4 lane rural corridor.	L4
CV343.CO.5	Create and annotate cross section sheets and plan and profile sheets.	L2

CO's	CO Statement	BT Level
Course Name and Course Code		Skill Development Course - 3 Water Gems (CV344)
CV344.CO. 1	Summarize the basic principles of water distribution modeling.	L2
CV344.CO. 2	Apply Water GEMS models to solve common water distribution system problems..	L3
CV344.CO. 3	Develop a deeper understanding of model creation and analysis using WaterGEMS.	L4
Course Name and Course Code		Employability Skills (HP305)
HP305.CO.1	Relate the importance of Employability Career Development.	L2
HP305.CO.2	Build necessary, specific professional skills.	L3
HP305.CO.3	Analyze the environment of employability.	L4
HP305.CO.4	Develop various techniques of effective team building in their professional life.	L6

CO's	CO Statement	BT Level
Final Year, BTech (Civil Engineering)		
Course Name and Course Code		Estimation and Costing (CV405)
CV405.CO.1	Describe the importance of estimation and able to use approximate estimate for rough estimation.	L2
CV405.CO.2	Write specification for construction materials and activities	L6
CV405.CO.3	Prepare detailed estimate for building, road and industrial structure	L6
CV405.CO.4	Calculate rates for various items of construction	L4
CV405.CO.5	Prepare valuation report for residential building	L6
CV405.CO.6	Describe types of contracts and to draft tender notices	L2
Course Name and Course Code		Building Services (CV471)
CV471.CO.1	Analyze plumbing and drainage plan.	L3
CV471.CO.2	Explain the concepts and techniques of water proofing and rain water harvesting	L2
CV471.CO.3	Prepare reflected ceiling plan	L3
CV471.CO.4	Define principles of air conditioning and thermal insulation.	L2
CV471.CO.5	Illustrate firefighting system	L2
CV471.CO.6	Identify materials of acoustics and sound insulation.	L2
Course Name and Course Code		Structural Dynamics & Earthquake Engineering (CV472)
CV472.CO.1	Apply fundamentals of structural dynamics and earthquake engineering to different structures.	L3
CV472.CO.2	Analyse and design of structural components from seismic considerations.	L4
CV472.CO.3	Analyse and implement protective measures and strengthening techniques.	L4
Course Name and Course Code		Railway Engineering (CV473)
CV473.CO.1	Explain Components of Railway Track, different Railway Gauges.	L2
CV473.CO.2	Design track Gradients as per given requirements.	L4
CV473.CO.3	Discuss various Types of Track Turnouts.	L2
CV473.CO.4	Describe purposes and facilities at Railway Stations.	L2
CV473.CO.5	Explain Interlocking and modern signal system.	L2
CV473.CO.6	Describe Surface Defects on Railway Track and Their Remedial Measures.	L3

CO's	CO Statement	BT Level
Course Name and Course Code		Numerical Methods in Civil Engineering (CV474)
CV474.CO.1	Describe various concepts of Numerical Methods and Mathematical Modelling.	L2
CV474.CO.2	Select appropriate Numerical Methods to Find the Roots of the Equations.	L2
CV474.CO.3	Analyse simultaneous Equation to solve the problems.	L4
CV474.CO.4	Discover relationship between experimental values in the form of Mathematical Equation.	L3
CV474.CO.5	Illustrate Solutions for real life problem using Numerical Integration.	L4
CV474.CO.6	Evaluate a solution of Differential Equation in given area for various boundary conditions.	L5
Course Name and Course Code		Financial Management (CV422)
CV422.CO.1	Understand the role of financial management in business operation.	L2
CV422.CO.2	Analyze the finances of individual corporation in term of capital requirements.	L3
CV422.CO.3	Have a understanding of risk within the context of financial decision making.	L2
CV422.CO.4	Have a understanding of supply chain management.	L2
Course Name and Course Code		Environmental Impact assessment & Climate Change (CV423)
CV423. CO.1	To identify the need to appraise and estimate the impact on environment.	L2
CV423. CO.2	To understand the basic principles of environmental impact assessment.	L2
CV423.CO.3	To learn its different components and methods of documentation and monitoring.	L2
CV423. CO.4	To illustrate about climate system its changes and causes.	L3
CV423. CO.5	To impart knowledge about impacts, adaptation and mitigation of climate change.	L3
Course Name and Course Code		Skill Development Course - 4 CFD (CV433)
CV343.CO.1	Prepare CFD-specific CAD models.	L3
CV343.CO.2	Prepare quality CFD simulation meshes from imported CAD geometry.	L3
CV343.CO.3	Select the appropriate boundary conditions for CFD simulation.	L4
CV343.CO.4	Analyze the solution of a CFD simulation.	L4
CV343.CO.5	Interpret the results by qualitative and quantitative post-processing.	L4
Course Name and Course Code		Skill Development Course - 4 QGIS (CV434)
CV434.CO.1	Use GIS to identify, explore, understand, and solve spatial problems.	L3
CV434.CO.2	Demonstrate GIS modeling skills.	L3
CV434.CO.3	Design and implement a GIS project.	L4
CV434.CO.4	Formulate applications of GIS technology.	L5

CO's	CO Statement	BT Level
Course Name and Course Code		Project Evaluation (CV464)
CV464.CO.1	Show the evidence of independent evaluation.	L1
CV464.CO.2	Critically analyzed the result and their implementation methodology.	L2
CV464.CO.3	Validate the results with standard tools and techniques.	L3
CV464.CO.4	Recognize the importance of documentation and report writing.	L4
Course Name and Course Code		Design of Hydraulics Structures (CV406)
CV406.CO.1	Perform the stability analysis of gravity dams.	L4
CV406.CO.2	Explain the causes of failure of different types of dams and their design criteria.	L2
CV406.CO.3	Design components of dam outlet works.	L3
CV406.CO.4	Design minor irrigation structures.	L3
CV406.CO.5	Integrate relevant concept and methodologies in the area of hydraulics, water resources and geotechnical engineering.	L3
Course Name and Course Code		Foundation Engineering (CV475)
CV475.CO.1	Adopt suitable soil exploration technique & interpretation of related data	L3
CV475.CO.2	Design both shallow and deep foundation	L5
CV475.CO.3	Solve the engineering behaviour of expansive soils & selection of suitable foundation.	L3
CV475.CO.4	Selection of geosynthetic materials and its application in foundation problems.	L4
Course Name and Course Code		Geospatial Tools and Techniques (CV476)
CV476.CO.1	Explain the concept of Geodetic Surveying for fixing the ground control points	L2
CV476.CO.2	Apply knowledge of Hydrographic Surveying to identify points & solve problems	L3
CV476.CO.3	Utilize the concepts of astronomical surveying	L3
CV476.CO.4	Apply the relevant concepts of hydrographic surveying	L3
CV476.CO.5	Analyse the various characteristics of remote sensing system	L4
CV476.CO.6	Distinguish working of various spaces-based positioning systems	L4
Course Name and Course Code		Air and Noise Pollution (CV477)
CV437.CO.1	Explain the Details About Source, Types and Impacts of Air Pollution.	L1
CV437.CO.2	Understand Meteorological Aspects of Air Pollution.	L2
CV437.CO.3	Identify Sampling and Analysis Techniques for Air Quality Assessment.	L2
CV437.CO.4	Illustrate The Various Air Pollution Control Measures.	L4
CV437.CO.5	Summarize Various Policies Related to Air Pollution Prevention and Control	L2
CV437.CO.6	Understand Noise Pollution Control Methods.	L2

CO's	CO Statement	BT Level
Course Name and Course Code		Capstone project (CV466)
CV466.CO.1	Portray individual skill for solving the problem.	L4
CV466.CO.2	Showcase and exhibit the best techniques and suitable methodology.	L5
CV466.CO.3	Cognize the significance of report and comprehend its reflections.	L4
CV466.CO.4	Assimilate digital and visual literacies.	L5
Course Name and Course Code		Engineering Economics (HP405)
HP405.CO.1	The students would have understood the basic concepts of Economics.	L2
HP405.CO.2	The students would have acquired knowledge, with respect to concepts, principles and practical applications of Economics, which govern the functioning of a firm/organization under different market conditions	L3
HP405.CO.3	The course is designed to improve critical thinking, problem solving skills by using economic models and theories and predict economic relationships	L3
HP405.CO.4	Students entering any profession in the workforce today must be able to utilize these basic economic principles. The course expected to develop critical understanding of current topics in economics and able to formulate their own opinions on economic issues	L4
Course Name and Course Code		Sociology (HP402)
HP402.CO.1	Get acquainted to sociology as a social science.	L1
HP402.CO.2	Explain the significance of sociology in solving problems.	L2
HP402.CO.3	Derive solutions to critical social issues.	L2
HP402.CO.4	Change their attitude towards social issues.	L3

Course Outcomes

B. Tech

(Computer Engineering)

(2019 – 2023)



CO's	CO Statement	BT Level
Second Year, BTech (Computer Engineering)		
Course Name and Course Code :- Data Structures (CS221)		
CS221.CO.1	Explain the concept of data structure.	L2
CS221.CO.2	Develop efficient algorithm for a given problem.	L3
CS221.CO.3	Analyze appropriate algorithm for solving the real world problem	L4
CS221.CO.4	Demonstrate advantages and disadvantages of data structures for variety of problems.	L3
CS221.CO.5	Choose effective data structures in approaching a problem solution	L2
CS221.CO.6	Make use of appropriate sorting and searching algorithm for a given application.	L3
Course Name and Course Code :- Computer Graphics (CS223)		
CS223.CO1	To explain different graphics primitives	L2
CS223.CO2	To apply related mathematical concepts to develop Computer graphics operations	L3
CS223.CO3	To demonstrate 2D and 3D transformation	L3
CS223.CO4	To apply various methods for projection	L3
CS223.CO5	To illustrate programs on clipping algorithms	L2
CS223.CO6	To develop animation and gaming application	L3
Course Name and Course Code :- DIG PROTO (ET224)		
ET206.CO1	Consolidate the techniques, skills and modern engineering tools.	L2
ET206.CO2	Apply acquired skills to the construction of a prototype project.	L3
ET206.CO3	Develop a prototype project by performing tasks in team.	L4
ET206.CO3	Demonstrate the work carried out in a team.	L3
Course Name and Course Code :- # JAVA Skill (CS227L)		
CS227.CO1	Implement Object Oriented Programming Concepts in java	L3
CS227.CO2	Use and create packages and interfaces in Java.	L3
CS227.CO3	Use graphical user interface in Java programs.	L3
CS227.CO4	Perform file handling operations.	L2
CS227.CO5	Implement exception handling in Java.	L3
CS227.CO6	Implement applications using JDBC .	L3
Course Name and Course Code :- #CPP Skill (CS226L)		
CS226.CO.1	Make use of class and objects using C++.	L3
CS226.CO.2	Demonstrate control structures using C++.	L2
CS226.CO.3	Implement the programs using data structures in C++.	L3
CS226.CO.4	Develop solution for real world problems using inheritance and polymorphism.	L3
CS226.CO.5	Apply standard template library to solve real world instances.	L3
CS226.CO.6	Make use of various file handling and exception handling operations in C++.	L3

CO's	CO Statement	BT Level
Course Name and Course Code :- Engineering Informatics (IT221)		
IT221.CO.1	Interpret Data, Information and Knowledge.	L2
IT221.CO.2	Make use of data acquisition techniques for an information system.	L3
IT221.CO.3	Categories different storage techniques.	L4
IT221.CO.4	Develop dashboard for effective communication of information.	L3
IT221.CO.5	Determine components of Human computer interaction.	L5
IT221.CO.6	Model IoT based information system.	L4
Course Name and Course Code :- Discrete Structure and Graph Theory (CS211)		
CS211.CO1	To learn logic and proof techniques to explore mathematical reasoning	L2
CS211.CO2	To formulate the problems precisely and solve the problems.	L3
CS211.CO3	To use appropriate set, function, or relation models to analyze practical examples.	L3
CS211.CO4	Model and analyze computational processes using combinatorial methods.	L3
CS211.CO5	To explore number of logical possibilities and algebraic structures.	L2
CS211.CO6	To use graph theory and associated terminology in practical example.	L3
Course Name and Course Code :- Appiled Mathematics (AS201)		
AS201.CO1	Evaluate the rank of a matrix and solve the system of equations.	L3
AS201.CO2	Determine the eigenvalues and eigenvectors of a matrix.	L2
AS201.CO3	Differentiate a vector valued function in plane or space.	L2
AS201.CO4	Compute the area and volume of the objects.	L2
AS201.CO5	Apply the Cauchy's Integral Theorem and evaluate the integrations.	L3
AS201.CO6	Execute the program codes using MATLAB.	L4
Course Name and Course Code :- Minor Project- Design (CS230)		
CS230.CO1	Delineate the problem to be solved.	L2
CS230.CO2	Comprehend the paramount of the health, safety and welfare of the public in the practice of engineering profession.	L3
CS230.CO3	Embark project planning and design.	L4
CS230.CO4	Inculcate problem solving skills and critically analyze the options available to solve the problem	L4
CS230.CO5	Cognize the importance of documentation and report writing.	L3
Course Name and Course Code :- Database Managment System (CS231)		
CS231.CO1	Perform basic operation with DBMS.	L2
CS231.CO2	Design and develop database application using ER diagram and normalization.	L3
CS231.CO3	Implement validation framework like integrity constraints and trigger.	L4
CS231.CO4	Apply ACID properties for transaction management.	L3
CS231.CO5	Explain concurrency control mechanism using lock based and timestamp based protocol	L2
CS231.CO6	Execute the basic operation on NoSQL database	L3

CO's	CO Statement	BT Level
Course Name and Course Code :- Advanced Data Structures (CS228)		
CS228.CO.1	Explain the working of basic and advanced data structures like trees, graphs, heaps, disjoint sets, hash tables, bloom filters.	L2
CS228.CO.2	Demonstrate the advantages and disadvantages of various data structures.	L3
CS228.CO.3	Choose appropriate data structures while building the applications.	L3
CS228.CO.4	Implement various applications using data structures like trees, graphs, hash tables, heaps.	L3
CS228.CO.5	Evaluate the performance of various data structures in terms of time and memory complexity .	L5
CS228.CO.6	Design own data structures using the build in data structures.	L6
Course Name and Course Code :- Computer Organization & Architecture (CS229)		
CS228.CO.1	Explain the architecture of the microprocessor 80386.	L2
CS228.CO.2	Develop assembly language programs using 32/64 bit registers	L3
CS228.CO.3	Illustrate Control unit and IO organizations	L2
CS228.CO.4	Explain the memory organization in the computer system	L2
CS228.CO.5	Illustrate arithmetic operations.	L2
CS228.CO.6	Explain Pipelining processing environment.	L2
Course Name and Course Code :- Professional Skill (HP202)		
HP202.CO1	Express themselves effectively in routine and real-world interactions through oral and written communication.	L3
HP202.CO2	Show Confident Public Speaking skills	L5
HP202.CO3	To showcase leadership qualities during tough tasks, make decisions and actions effectively within time.	L5
Course Name and Course Code :- Programming Lab (CS224)		
CS224.CO1	Explain the concept of data structure.	L2
CS224.CO2	Develop efficient algorithm for a given problem.	L3
CS224.CO3	Analyze appropriate algorithm for solving the real world problem.	L4
CS224.CO4	Demonstrate advantages and disadvantages of data structures for variety of problems.	L3
CS224.CO5	Choose effective data structures in approaching a problem solution.	L2
CS224.CO6	Make use of appropriate sorting and searching algorithm for a given application.	L3
Course Name and Course Code :- Minor Project - Implementation (CS240)		
CS240.CO1	Select appropriate method for making of solution.	L1
CS240.CO2	Compare various engineering tools/technique to develop solution.	L2
CS240.CO3	Justify the selected method/tools opted for making of solution.	L2
CS240.CO4	Develop tangible solution to dened problem.	L5
CS240.CO5	Test the developed solution.	L4
CS240.CO6	Document solution in the form of Project report / IPR drafts.	L3

CO's	CO Statement	BT Level
Third Year, BTech (Computer Engineering)		
Course Code and Course Name :- Operating System (CS341)		
CS341.CO1	Illustrate the role of OS in the management of system resources.	L2
CS341.CO2	Organize process and threads execution in operating system effectively	L3
CS341.CO3	Identify deadlock to resolve the related issues.	L3
CS341.CO4	Analyze the memory management and its allocation policies	L4
CS341.CO5	Make use of the file system, protection and security aspects of OS effectively	L3
Course Code and Course Name :- Theory of Computation (CS342)		
CS342.CO1	Differentiate between types of languages and respective recognition automata.	L2
CS342.CO2	Construct various types of automata and grammar from language and vice versa.	L3
CS342.CO3	Make use of the properties of languages and automata to design complex automata prove equivalence of automata	L3
CS342.CO4	Decide the type of automata to be used to recognize the particular language.	L5
CS342.CO5	Identify decidability of languages.	L3
Course Code and Course Name :- Minor Project - Implementation (CS343)		
CS343.CO1	Comprehend signals and communications types.	L2
CS343.CO2	Build different types of network topologies and protocols.	L2
CS343.CO3	Evaluate routing protocols for different real time systems.	L4
CS343.CO4	Analyze connection oriented and connectionless services.	L3
CS343.CO5	Demonstrate different application/systems related to networking.	L5
Course Code and Course Name :- Descriptive Analytics (CS351)		
CS351.CO1	Outline the data warehouse architecture. (Understanding-L2)	L2
CS351.CO2	Build data marts using different modeling techniques for given application(Apply-L3)	L3
CS351.CO3	Create OLAP cubes and Visualize data using visualizing tools.(Apply-L3)	L3
CS351.CO4	Recognize trends, detect outliers, and summarize data sets(Apply-L3)	L3
CS351.CO5	Validate hypothesis using various testing methods for a real-life problem statement(Evaluate-L4)	L4
CS351.CO6	Predict output by applying correct regression model.(Apply-L3)	L3
Course Code and Course Name :- Artificial Intelligence (CS352)		
CS352.CO1	Apply basic principles of knowledge representation, inference and reasoning in Artificial Intelligence[L3].	L3
CS352.CO2	Apply problem solving and searching techniques of Artificial Intelligence to reach desired goals [L3].	L3
CS352.CO3	Analyze appropriate methods of Machine Learning based on the particular characteristics of the domains and applications under consideration[L4].	L4
CS352.CO4	Accurately formulate, test and evaluate hypothesis and performance of machine learning algorithms[L4].	L4

CO's	CO Statement	BT Level
Course Code and Course Name :- Cloud Computing Foundations (CS353)		
CS353.CO1	To classify various cloud computing services and models	L2
CS353.CO2	To build various compute services in cloud	L3
CS353.CO3	To distinguish between various storage related services used during application development	L4
CS353.CO4	To select appropriate database service during application development	L3
CS353.CO5	To choose various networking and security options during application development	L3
CS353.CO6	To estimate the resource requirements for the application with high availability and reliability features	L5
Course Code and Course Name :- Cryptography & System Security (IT351)		
IT351.CO1	Identify the security threats, and the security services and mechanisms to counter them [L3].	L3
IT351.CO2	Apply security principles to protect the data.[L3]	L3
IT351.CO3	Analyze symmetric key and asymmetric key algorithm. [L4]	L4
IT351.CO4	Identify the different Authentication method in digital signature [L3]	L3
IT351.CO5	Analyze network security protocols [L4].	L4
IT351.CO6	Identify and investigate network security threat and provide solution to protect the network [L3].	L3
Course Code and Course Name :- Project Management (CS361)		
CS361.CO1	Identify the Project Management Knowledge Areas and Processes	L1
CS361.CO2	Classify the responsibilities while designing the Project Master Plan	L2
CS361.CO3	Outline the Cost Estimating and Cost Escalation Process	L2
CS361.CO4	Demonstrate and highlight The Processes of Project Quality Management	L3
CS361.CO5	Analyze Project Management Maturity and Maturity Models	L4
Course Code and Course Name :- Skill Development :WebTechnology (CS346)		
CS346.CO1	To understand the concepts and principles of web applications and development.	L2
CS346.CO2	To apply current web technologies and web business models.	L3
CS346.CO3	To understand and apply Web development processes.	L3
CS346.CO4	To understand the world wide web client-server request and response.	L2
Course Code and Course Name :- Skill Development Red Hat Linux (CS344)		
CS344.CO1	Illustrate essential Linux administration tasks.	L2
CS344.CO2	Experiment with installation, networking and user profile files.	L3
CS344.CO3	Examine physical storage, file systems and log files.	L3
CS344.CO4	Inspect the Linux processes, control services, daemons and basic security administration.	L3
CS344.CO5	Analyze Redhat Linux System with a comprehensive and systematic approach.	L4

CO's	CO Statement	BT Level
Course Code and Course Name :- Project Design (CS350)		
CS350.CO1	Delineate the problem to be solved.	L3
CS350.CO2	Inculcate problem solving skills by critically analyzing real world needs, possible solutions and challenges.	L4
CS350.CO3	Carry out systematic literature review, planning and project design.	L4
CS350.CO4	Cognize the importance of documentation and report writing.	L3
Course Code and Course Name :- Design and Analysis of Algorithms (CS347)		
CS347.CO1	Make use of the Five problem solving strategy to design an algorithm.	L3
CS347.CO2	Analyze the given algorithm in terms of its computational complexity.	L4
CS347.CO3	Apply prior knowledge of standard algorithm to solve new problem.	L3
CS347.CO4	Evaluate the intractable problems using approximation algorithms.	L5
CS347.CO5	Compare various string matching Algorithms.	L2
Course Code and Course Name :- Software Engineering (CS349)		
CS349.CO1	Classify process models.	L2
CS349.CO2	Analyze conformance of the requirement related to project development.	L4
CS349.CO3	Develop design models using UML diagram.	L3
CS349.CO4	Mitigate the risk associated with project development.	L4
CS349.CO5	Evaluate the schedule, cost and staff associated with project.	L5
CS349.CO6	Review quality assurance through test driven development.	L4
Course Code and Course Name :- Compiler Design (CS348)		
CS348.CO1	Use different compiler construction tools to show the working of every compiler phase(L3)	L3
CS348.CO2	Demonstrate working of lexical analyser and parser by using FLEX & BISON(L3)	L3
CS348.CO3	Choose efficient parsing techniques for given grammar(L4)	L4
CS348.CO4	Develop Syntax Directed Translation Schemes for the given grammar(L6)	L6
CS348.CO5	Apply code generation and optimization techniques(L3)	L3
Course Code and Course Name :- Employability & Career Development (HP305)		
HP305.CO1	Relate the importance of Employability Career Development (L2)	L2
HP305.CO2	Build necessary, specific professional skills (L3)	L3
HP305.CO3	Analyze the environment of employability (L4)	L4
HP305.CO4	Develop various techniques of effective team building in their professional life (L6)	L6

CO's	CO Statement	BT Level
Course Code and Course Name :- Machine Learning (CS355)		
CS355.CO1	Design and implement various machine learning algorithms in a range of real-world applications	L3
CS355.CO2	Analysis of the fundamental issues and challenges of model selection and its complexity	L4
CS355.CO3	Make use of various algorithms for Natural Language Processing and Information Retrieval	L3
CS355.CO4	Decide appropriate methods for applications of machine learning in Computer Vision and Pattern Recognition.	L4
Course Code and Course Name :- Predictive Analytics (CS354)		
CS354.CO1	Analyze various Association Algorithms.	L3
CS354.CO2	Apply the classification and prediction techniques to solve real world problems.	L3
CS354.CO3	Use advanced classification techniques.	L3
CS354.CO4	Apply artificial neural network on a real application.	L3
CS354.CO5	Analyze the unsupervised learning methods.	L4
CS354.CO6	Apply the conceptual clustering and ensemble learning methods on a real-life	L3
Course Code and Course Name :- Cloud Native Application Development (CS356)		
CS356.CO1	To configure the software development kit for various AWS services	L3
CS356.CO2	To develop various compute services in cloud	L3
CS356.CO3	To access various database services through a web application	L3
CS356.CO4	To distinguish between protocols for developing own API	L4
CS356.CO5	To select an appropriate configuration for provisioning infrastructure as a code	L3
CS356.CO6	To develop a web application using various cloud services	L3
Course Code and Course Name :- Cyber Security & Forensic (CS352)		
CS352.CO1	Identify different cybercrimes and offences that can attack a network.	L1
CS352.CO2	Complete Implementing a secure wireless network in the organization.	L2
CS352.CO3	Articulate a secure network environment with the help of various network components.	L2
CS352.CO4	Illustrate the fundamental risk management principles related to Cyber intelligence.	L4
CS352.CO5	Analyze the Digital evidences and Digital Forensics Life Cycle.	L3
CS352.CO6	Evaluate the security vulnerabilities in the system with the help of forensics tools.	L4
Course Code and Course Name :- SDL : Advanced Java (CS357)		
CS357.CO1	Construct java applications using multithreading and networking concepts	L3
CS357.CO2	Build web applications using Servlet, JSP.	L3
CS357.CO3	Explore JSF framework for the better user interfaces.	L2
CS357.CO4	Integrate Hibernate and spring framework with applications	L4
CS357.CO5	Develop advanced enterprise web applications	L4

CO's	CO Statement	BT Level
Course Code and Course Name :- SDL: .DOT NET (CS358)		
CS358.CO1	Implement object-oriented programming and C# multitasking concepts(L3)	L3
CS358.CO2	Explore application development with C# 8.0 and .NET (L3)	L2
CS358.CO3	Design windows forms for different applications(L6)	L3
CS358.CO4	Use Entity Framework and work with relational databases(L3)	L3
CS358.CO5	Develop web applications using a combination of client-side and server-side technologies (L3)	L3
Course Code and Course Name :- SDL : RED HAT LINUX (CS359)		
CS349.CO1	Illustrate essential Linux administration tasks.	L2
CS349.CO2	Experiment with installation, networking and user profiles.	L3
CS349.CO3	Examine physical storage, file systems and log files.	L3
CS349.CO4	Inspect the Linux processes, control services, daemons and basic security administration.	L2
CS349.CO5	Analyze Redhat Linux System with a comprehensive and systematic approach.	L4
Course Code and Course Name :- Minor Project - Implementation (CS360)		
CS360.CO1	Analyze techniques, algorithms and design process related to the project.	L4
CS360.CO2	Infer conclusions by implementing/developing/experimenting/simulating/testing the different techniques/processes.	L4
CS360.CO3	Cognize the importance of documentation and report writing.	L3

CO's	CO Statement	BT Level
Final Year, BTech (Computer Engineering)		
Course Code and Course Name :- Distributed Systems (CS481)		
CS481.CO1	Identify the goals of Distributed System for a particular Architecture type.	L2
CS481.CO2	Implement the MPI programs for distributed system applications.	L3
CS481.CO3	Differentiate between different clock synchronization algorithms.	L3
CS481.CO4	Choose appropriate algorithms for incorporating replication and consistency in the given distributed system application.	L5
CS481.CO5	Decide fault tolerance mechanism to be used for particular distributed system application	L5
CS481.CO6	Explain distributed File System with reference to scalability, concurrency, transparency, replication and Fault Tolerance.	L2
Course Code and Course Name :- Wireless and Mobile Networks (CS472)		
CS472.C01	Determine issues and challenges in Wireless Networks.	L3
CS472.C02	Categories different types of wireless networks.	L4
CS472.C03	Determine issues and challenges of Mobile Ad-Hoc Networks.	L3
CS472.C04	Assessing the features of Mobile Ad-Hoc Networks.	L3
CS472.C05	Assessing the features of Wireless Sensor Networks.	L3
CS472.C06	Apply different security algorithms in wireless Network.	L3
Course Code and Course Name :- Information Retrieval (CS473)		
CS473.CO1	Understand the process of representing, retrieving and analyzing IR models and advanced IR models.	L2
CS473.CO2	Understand structure of web and working of crawlers	L2
CS473.CO3	Develop IR models form standard IR models	L6
CS473.CO4	Demonstrate the standard methods for web indexing and evaluation	L3
CS473.CO5	To analyze optimization techniques & various algorithms used in web search	L4
Course Code and Course Name :- Computer Vision (CS477)		
CS477.CO1	Explain image formation and operations.	L2
CS477.CO2	Implement Binary Image Processing operations.	L3
CS477.CO3	Compare different image enhancement and feature extraction techniques.	L3
CS477.CO4	Apply methods of computer vision for image segmentation and recognition.	L3
CS477.CO5	Identify the design requirement of video processing.	L2
CS477.CO6	Suggest a design of a computer vision system for a specific problem.	L5

CO's	CO Statement	BT Level
Course Code and Course Name :- Skill Development Course - Android Application Development (CS456)		
CS456.CO1	Learn Android application development tools and environment.	L2
CS456.CO2	Prepare User Interfaces for the Android platform.	L3
CS456.CO3	Apply SQLite light weight database and store information in persistence storage	L3
CS456.CO4	Create various Layouts and Widgets in Android Applications	L4
CS456.CO5	Build Android application	L5
Course Code and Course Name :- Skill Development Course - AWS Cloud Services (CS485)		
CS485.CO1	Define different types of cloud computing models and review the AWS Cloud Adoption Framework (AWS CAF)	L2
CS485.CO2	Create VPC and add additional components to produce customized network	L5
CS485.CO3	Demonstrate when to use AWS Elastic Beanstalk, AWS Lambda.	L2
CS485.CO4	Implement Amazon RDS database such as launching, configuring and interacting.	L3
CS485.CO5	Design and configure different types of security credentials in IAM	L5
Course Code and Course Name :- Ethical Hacking (IT461)		
IT461.CO1	Describe hacking concepts, and scopes.	L2
IT461.CO2	Apply different approaches to perform Footprinting through search engine, web and network sites.	L3
IT461.CO3	Analyze vulnerability assessment reports.	L3
IT461.CO4	Apply different techniques to privilege escalation and gain the access to a system.	L4
IT461.CO5	Perform various web server attacks its countermeasures.	L2
IT461.CO6	Demonstratedifferent techniques to perform various web application attack.	L5
Course Code and Course Name :- Big Data Analytics (CS461)		
CS461.CO1	Prepare for data summarization, query, and analysis.	L2
CS461.CO2	Apply data modeling techniques to large data sets.	L3
CS461.CO3	Inspect applications for Big Data analytics.	L4
CS461.CO4	Build a complete business data analytic solution.	L5
Course Code and Course Name :- Deep Learning (CS462)		
CS462.CO1	Understand the fundamentals of deep learning.	L2
CS462.CO2	Recognize significances of deep learning algorithms to handle high dimensional data.	L2
CS462.CO3	Interpret the application requirements in field of Computer vision and Natural language processing.	L3
CS462.CO4	Analyze experimental results of different algorithms in deep learning.	L4
CS462.CO5	Optimize algorithms using various approaches to improve performance of model.	L5
CS462.CO6	Assemble variety of deep learning algorithm to develop the model.	L5

CO's	CO Statement	BT Level
Course Code and Course Name :- Cloud Native Apps (CS463)		
CS463.CO1	To develop the automated the SDLC Process	L5
CS463.CO2	To summerize the various advanced facilities available to launch infrastructure using cloudformation.	L2
CS463.CO3	To differentiate between AWS Elastic Container Service, AWS Fargate and AWS Elastic Kubernetes Service.	L2
CS463.CO4	To implement the various policies and standards required for automation.	L3
CS463.CO5	To design the systems with detailed plan for High Availability and Disaster Recovery.	L4
CS463.CO6	To develop a infrastructure using Jenkins.	L5

Course Outcomes

B. Tech

(Electronics Engineering)

(2019 – 2023)



CO's	CO Statement	BT Level
Second Year, BTech (Electronics Engineering)		
Course Name and Course Code		Electronic Devices and Circuits (ET221)
ET221.CO.1	Identify and correctly utilize the external lead structure and basic electrical characteristics of common semiconductor devices (PN junctions, MOSFETs, and BJTs)	L3
ET221.CO.2	Illustrate the feedback mechanism in the design of electronic circuits	L3
ET221.CO.3	Scrutinize and project electronic circuits for various signals at low and high frequencies	L4
ET221.CO.4	Analyze performance parameters of various electronics circuits	L4
ET221.CO.5	Compile component ideas into electronic circuits	L6
Course Name and Course Code		Digital Systems & Applications (ET222)
ET222.CO.1	Design combinational circuits and its applications	L3
ET222.CO.2	Design various sequential circuits	L4
ET222.CO.3	Construct state diagrams for various sequential circuits	L4
ET222.CO.4	Identify various logic families and semiconductor memories	L3
ET222.CO.5	Develop VHDL code for various combinational and sequential digital circuits	L3
Course Name and Course Code		Signals and Systems (ET223)
ET223.CO.1	Classify various types of signals and systems.	L2
ET223.CO.2	Classify systems based on their properties and determine the response of LTI system using convolution.	L4
ET223.CO.3	Analyze the spectral characteristics of continuous-time periodic and a periodic signals using Fourier analysis.	L4
ET223.CO.4	Describe sampling theorem and reconstruction of signal.	L2
ET223.CO.5	Apply the Laplace transform and Z- transform for analyze of continuous-time and discrete-time signals and systems.	L3
Course Name and Course Code		Digital Prototyping (ET224)
ET224.CO.1	Consolidate the techniques, skills and modern engineering tools.	L5
ET224.CO.2	Apply acquired skills to the construction of a prototype project.	L3
ET224.CO.3	Develop a prototype project by performing tasks in team.	L6
ET224.CO.4	Demonstrate the work carried out in a team.	L3
Course Name and Course Code		Minor Project Design (ET230)
ET230.CO.1	Delineate the problem to be solved.	L2
ET230.CO.2	Comprehend the paramount of the health, safety and welfare of the public in the practice of engineering profession.	L1
ET230.CO.3	Embark project planning and design.	L5
ET230.CO.4	Inculcate problem solving skills and critically analyze the options available to solve the problem.	L2
ET230.CO.5	Cognize the importance of documentation and report writing.	L1

CO's	CO Statement	BT Level
Course Name and Course Code		Object Oriented Programming using JAVA (ET227)
ET227.CO.1	Describe the principles of object oriented programming	L2
ET227.CO.2	Apply the concepts of classes, methods & inheritance to write Java program	L3
ET227.CO.3	Describe and use the concepts in Java to develop simple user friendly applications	L2
Course Name and Course Code		Electromagnetic Theory (ET231)
ET231.CO.1	Apply appropriate coordinate system and transformations to describe spatial variation of EM quantities.	L3
ET231.CO.2	Explain laws governing electrostatics and magnetostatics for wireless communication and antenna systems.	L2
ET231.CO.3	Analyze basic electromagnetic problems using Maxwell's equation to demonstrate propagation of fluctuating electric and magnetic fields.	L3
ET231.CO.4	Appreciate the working of transmission line, waveguides and impedance calculations using Smith chart.	L3
ET231.CO.5	Explain different modes of wave propagations for terrestrial, satellite and 5G communication.	L2
Course Name and Course Code		Network Analysis Techniques (ET232)
ET232.CO.1	Analyze complex linear circuits analytically and graphically.	L4
ET232.CO.2	Examine the performance of first and second order circuits in time and frequency domain.	L4
ET232.CO.3	Design and analyze the response of resonance circuits.	L4
ET232.CO.4	Analyze different filter configurations and applications there-of.	L4
ET232.CO.5	Inspect two port network of a given electronic circuit.	L4
ET232.CO.6	Derive general solution of a transmission line and extend the concept to distortion-less line.	L3
Course Name and Course Code		Microcontroller and Interfacing (ET233)
ET233.CO.1	Compare the features of different families of the microcontrollers.	L2
ET233.CO.2	Explain the architecture and features of the 8 bit microcontroller.	L2
ET233.CO.3	Categorize the software and hardware tools for embedded system development.	L2
ET233.CO.4	Apply the interfacing techniques for various peripherals with the microcontroller.	L3
Course Name and Course Code		Minor Project Implementation (ET240)
ET240.CO.1	Select appropriate method for making of solution.	L1
ET240.CO.2	Compare various engineering tools/technique to develop solution.	L4
ET240.CO.3	Justify the selected method/tools opted for making of solution.	L5
ET240.CO.4	Develop tangible solution to defined problem.	L6
ET240.CO.5	Test the developed solution.	L4
ET240.CO.6	Document solution in the form of Project report / IPR drafts.	L3

CO's	CO Statement	BT Level
Third Year, BTech (Electronics Engineering)		
Course Name and Course Code		Control Systems (ET341)
ET341.CO.1	Develop the mathematical model of the physical systems.	L3
ET341.CO.2	Develop and analyze state space models.	L3
ET341.CO.3	Analyze the response of the closed and open loop systems.	L4
ET341.CO.4	Analyze the stability of the closed and open loop systems.	L4
ET341.CO.5	Explain a closed loop motion control system with an application.	L2
Course Name and Course Code		Digital Signal Processing (ET342)
ET342.CO.1	Analyze LTI systems using DFT	L2
ET342.CO.2	Model & Synthesize IIR and FIR filters	L2
ET342.CO.3	Develop single stage and multi-stage sampling rate converters	L4
ET342.CO.4	Build practical applications using DSP processor in the context of architecture and programming	L4
Course Name and Course Code		Embedded System Design (ET343)
ET343.CO.1	Interpret H/W & S/W co-design.	L3
ET343.CO.2	Explain architecture of ARM processor	L2
ET343.CO.3	Analyze ARM cortex microcontroller with its applications in embedded system.	L4
ET343.CO.4	Develop applications using ARM Cortex based microcontroller.	L4
Course Name and Course Code		IoT Architecture & Sensors (ET352)
ET352.CO.1	Apply the basic fundamental to build an IoT application	L3
ET352.CO.2	Analyze various M2M and IoT architectures	L4
ET352.CO.3	Create IoT solutions using sensors, actuators and Devices	L5
ET352.CO.4	Analyze the IoT data with the help of Cloud Computing	L3
ET352.CO.5	Analyze IoT platform design methodology and its constraints	L3
Course Name and Course Code		Skill Development Course: Data Science (ET345)
ET345.CO.1	Apply python programming concepts	L3
ET345.CO.2	Relate basic concepts of algebra, calculus and statistics	L2
ET345.CO.3	Apply different data visualization libraries and feature engineering techniques	L3
Course Name and Course Code		Power Electronics (ET361)
ET361.CO.1	Design and implement a triggering / gate drive circuit for power converters.	L4
ET361.CO.2	Design and analyze different power electronic converters.	L4
ET361.CO.3	Analyze various power quality issues and their remedies.	L3
ET361.CO.4	Analyze applications of power electronics.	L3

CO's	CO Statement	BT Level
Course Name and Course Code		Principles of Communication Systems (ET362)
ET362.CO.1	Illustrate the fundamental concepts and terminologies of communication systems	L2
ET362.CO.2	Inspect different analog modulation, demodulation schemes along with transmitter and receiver circuitry	L4
ET362.CO.3	Explain the concept of random variables and processes with statistical parameters	L3
ET362.CO.4	Analyze various source and channel coding methods	L4
ET362.CO.5	Examine optimum receiving techniques and error performances of digital modulation schemes	L4
Course Name and Course Code		Soft Computing (ET363)
ET363.CO.1	Explain fundamentals of machine learning.	L2
ET363.CO.2	Describe supervised and unsupervised learning.	L2
ET363.CO.3	Analyze mathematically various machine learning approaches and paradigms.	L3
ET363.CO.4	Implement machine learning solutions for classification, regression, and clustering problems.	L4
ET363.CO.5	Compare various machine learning techniques and to get an insight of when to apply a particular machine learning approach.	L4
Course Name and Course Code		IoT Network and Protocols (ET372)
ET372.CO.1	Interpret fundamentals underlying principles of networking	L2
ET372.CO.2	Prioritize networking protocol as per the real time applications	L3
ET372.CO.3	Articulate the cryptography techniques used in network security	L3
ET372.CO.4	Defend various security parameters related to network	L4
Course Name and Course Code		Skill Development Course - Networking (ET364)
ET364.CO.1	Assign various IP address in network	L2
ET364.CO.2	Install and configure the web server	L3
ET364.CO.3	Configure network for routing and switching	L4
Course Name and Course Code		Robot Dynamics and Control (EX371)
EX371.CO.1	Explain block schematic of robotic control system	L2
EX371.CO.2	Design of controller using state space.	L4
EX371.CO.3	Develop control law for a given application	L4
EX371.CO.4	Compute the manipulator motion and statics	L4
EX371.CO.5	Apply knowledge of mathematics to obtain the dynamic model of robotic arm	L3

CO's	CO Statement	BT Level
Final Year, BTech (Electronics Engineering)		
Course Name and Course Code		HDL-Digital Circuit Design (ET461)
ET461.CO.1	Analyse different architectures of PLDs (L2)	L4
ET461.CO.2	Comprehend the basic concepts of Verilog (L2)	L2
ET461.CO.3	Model digital circuits with Verilog, simulate, synthesis and prototype in PLDs. (L4)	L4
ET461.CO.4	Examine verification types and associated parameters (L3)	L3
Course Name and Course Code		Deep Learning (ET481)
ET481.CO.1	Explain fundamentals of Neural Network and Deep Learning	L2
ET481.CO.2	Describe Convolution Neural Network	L2
ET481.CO.3	Explain Sequence Model and Encoder Decoder Model	L2
ET481.CO.4	Develop Deep Learning model for classification and object detection	L3
ET481.CO.5	Evaluate the performance of Deep Learning models	L5
Course Name and Course Code		Digital Image Processing (ET482)
ET482.CO.1	Illustrate the fundamental concepts and process of image processing	L2
ET482.CO.2	Construct an algorithm for spatial and frequency domain filtering	L2
ET482.CO.3	Determine various image compression and segmentation techniques	L4
ET482.CO.4	Examine digital image processing techniques to real world applications	L3
ET482.CO.5	Analyze the problems in the field of robotics and other applications	L3
Course Name and Course Code		Electric Vehicle (ET483)
ET483.CO.1	Model vehicle parameters	L3
ET483.CO.2	Explore the EV motors and their controllers	L2
ET483.CO.3	Develop the battery modelling and its parameters	L3
ET483.CO.4	Illustrate the Model Based Development using MATLAB and SIMULINK	L2
ET483.CO.5	Analyse different Electric vehicle case studies	L4
Course Name and Course Code		RTOS (ET484)
ET484.CO.1	Explain the characteristics of real-time embedded applications	L2
ET484.CO.2	Interpret the RTX Kernel Structure	L2
ET484.CO.3	Apply Scheduling and synchronization in RTX	L3
ET484.CO.4	Utilize the inter task communication in RTX for an application	L3
ET484.CO.5	Summarize popular RTOS available for different applications	L2

CO's	CO Statement	BT Level
Course Name and Course Code		Data Management & Analytics (ET472)
ET472.CO.1	Demonstrate the data lifecycle	L2
ET472.CO.2	Apply basic concepts of database management system	L3
ET472.CO.3	Apply basic operations with DBMS	L3
ET472.CO.4	Infer the importance of the domain context for data analytics	L2
ET472.CO.5	Illustrate basic concepts of big data analytics and their components	L2
ET472.CO.6	Analyze the database system design, implementation, and maintenance	L4
Course Name and Course Code		Skill DevelopmentCourse: EmbeddedLinux Systems (ET463)
ET463.CO.1	Explore the features of Linux through command line and shell programming	L2
ET463.CO.2	Demonstrate the usage of file system in Linux	L3
ET463.CO.3	Apply toolchain in the embedded Linux environment	L3
ET463.CO.4	Design the various device drivers for embedded application	L4
Course Name and Course Code		Skill DevelopmentCourse: System Modelling (ET465)
ET465.CO.1	Implement methodology to improve efficiency of MATLAB programming code	L4
ET465.CO.2	Exploit the concept of OOP in MATLAB	L3
ET465.CO.3	Create an application using App Designer	L6
ET465.CO.4	Build a system model in electrical, mechanical and power domain	L6
ET465.CO.5	Design a user friendly application	L6
Course Name and Course Code		AI in Robotics (EX471)
EX471.CO.1	Apply suitable algorithm for Search and Planning for AI robotics system.	L3
EX471.CO.2	Apply Robotic vision algorithms for vision guided robotics.	L3
EX471.CO.3	Apply suitable algorithm for machine learning algorithms for AI robotics systems.	L4
EX471.CO.4	Analyze various applications in the field of AI Robotics & Vision guided Robotics.	L3
Course Name and Course Code		Biomedical Engineering (EX441)
EX441.CO.1	Elaborate the origin of various bio-signals and the electrodes used to measure them.	L2
EX441.CO.2	Illustrate the various biomedical and radiological instruments	L3
EX441.CO.3	Apply the knowledge of electrical safety while designing.	L3
EX441.CO.4	Apply the knowledge of biotelemetry and telemedicine in the fields of biomedical.	L4
EX441.CO.5	Apply the concept of biomechanics and biomaterial in biomedical Engineering.	L4

Course Outcomes

B. Tech

**(Electronics and
Telecommunication Engineering)**

(2019 – 2023)



CO's	CO Statement	BT Level
Second Year, BTech (Electronics and Telecommunication Engineering)		
Course Name and Course Code		Electronic Devices and Circuits (ET221)
ET221.CO.1	Identify and correctly utilize the external lead structure and basic electrical characteristics of common semiconductor devices (PN junctions, MOSFETs, and BJTs)	L3
ET221.CO.2	Illustrate the feedback mechanism in the design of electronic circuits	L3
ET221.CO.3	Scrutinize and project electronic circuits for various signals at low and high frequencies	L4
ET221.CO.4	Analyze performance parameters of various electronics circuits	L4
ET221.CO.5	Compile component ideas into electronic circuits	L6
Course Name and Course Code		Digital Systems & Applications (ET222)
ET222.CO.1	Design combinational circuits and its applications	L3
ET222.CO.2	Design various sequential circuits	L4
ET222.CO.3	Construct state diagrams for various sequential circuits	L4
ET222.CO.4	Identify various logic families and semiconductor memories	L3
ET222.CO.5	Develop VHDL code for various combinational and sequential digital circuits	L3
Course Name and Course Code		Signals and Systems (ET223)
ET223.CO.1	Classify various types of signals and systems.	L2
ET223.CO.2	Classify systems based on their properties and determine the response of LTI system using convolution.	L4
ET223.CO.3	Analyze the spectral characteristics of continuous-time periodic and a periodic signals using Fourier analysis.	L4
ET223.CO.4	Describe sampling theorem and reconstruction of signal.	L2
ET223.CO.5	Apply the Laplace transform and Z- transform for analyze of continuous-time and discrete-time signals and systems.	L3
Course Name and Course Code		Digital Prototyping (ET224)
ET224.CO.1	Consolidate the techniques, skills and modern engineering tools.	L5
ET224.CO.2	Apply acquired skills to the construction of a prototype project.	L3
ET224.CO.3	Develop a prototype project by performing tasks in team.	L6
ET224.CO.4	Demonstrate the work carried out in a team.	L3
Course Name and Course Code		Minor Project Design (ET230)
ET230.CO.1	Delineate the problem to be solved.	L2
ET230.CO.2	Comprehend the paramount of the health, safety and welfare of the public in the practice of engineering profession.	L1
ET230.CO.3	Embark project planning and design.	L5
ET230.CO.4	Inculcate problem solving skills and critically analyze the options available to solve the problem.	L2
ET230.CO.5	Cognize the importance of documentation and report writing.	L1

CO's	CO Statement	BT Level
Course Name and Course Code		Object Oriented Programming using JAVA (ET227)
ET227.CO.1	Describe the principles of object oriented programming	L2
ET227.CO.2	Apply the concepts of classes, methods & inheritance to write Java program	L3
ET227.CO.3	Describe and use the concepts in Java to develop simple user friendly applications	L2
Course Name and Course Code		Electromagnetic Theory (ET231)
ET231.CO.1	Apply appropriate coordinate system and transformations to describe spatial variation of EM quantities.	L3
ET231.CO.2	Explain laws governing electrostatics and magnetostatics for wireless communication and antenna systems.	L2
ET231.CO.3	Analyze basic electromagnetic problems using Maxwell's equation to demonstrate propagation of fluctuating electric and magnetic fields.	L3
ET231.CO.4	Appreciate the working of transmission line, waveguides and impedance calculations using Smith chart.	L3
ET231.CO.5	Explain different modes of wave propagations for terrestrial, satellite and 5G communication.	L2
Course Name and Course Code		Network Analysis Techniques (ET232)
ET232.CO.1	Analyze complex linear circuits analytically and graphically.	L4
ET232.CO.2	Examine the performance of first and second order circuits in time and frequency domain.	L4
ET232.CO.3	Design and analyze the response of resonance circuits.	L4
ET232.CO.4	Analyze different filter configurations and applications there-of.	L4
ET232.CO.5	Inspect two port network of a given electronic circuit.	L4
ET232.CO.6	Derive general solution of a transmission line and extend the concept to distortion-less line.	L3
Course Name and Course Code		Microcontroller and Interfacing (ET233)
ET233.CO.1	Compare the features of different families of the microcontrollers.	L2
ET233.CO.2	Explain the architecture and features of the 8 bit microcontroller.	L2
ET233.CO.3	Categorize the software and hardware tools for embedded system development.	L2
ET233.CO.4	Apply the interfacing techniques for various peripherals with the microcontroller.	L3
Course Name and Course Code		Minor Project Implementation (ET240)
ET240.CO.1	Select appropriate method for making of solution.	L1
ET240.CO.2	Compare various engineering tools/technique to develop solution.	L4
ET240.CO.3	Justify the selected method/tools opted for making of solution.	L5
ET240.CO.4	Develop tangible solution to defined problem.	L6
ET240.CO.5	Test the developed solution.	L4
ET240.CO.6	Document solution in the form of Project report / IPR drafts.	L3

CO's	CO Statement	BT Level
Third Year, BTech (Electronics and Telecommunication Engineering)		
Course Name and Course Code		Control Systems (ET341)
ET341.CO.1	Develop the mathematical model of the physical systems.	L3
ET341.CO.2	Develop and analyze state space models.	L3
ET341.CO.3	Analyze the response of the closed and open loop systems.	L4
ET341.CO.4	Analyze the stability of the closed and open loop systems.	L4
ET341.CO.5	Explain a closed loop motion control system with an application.	L2
Course Name and Course Code		Digital Signal Processing (ET342)
ET342.CO.1	Analyze LTI systems using DFT	L2
ET342.CO.2	Model & Synthesize IIR and FIR filters	L2
ET342.CO.3	Develop single stage and multi-stage sampling rate converters	L4
ET342.CO.4	Build practical applications using DSP processor in the context of architecture and programming	L4
Course Name and Course Code		Embedded System Design (ET343)
ET343.CO.1	Interpret H/W & S/W co-design.	L3
ET343.CO.2	Explain architecture of ARM processor	L2
ET343.CO.3	Analyze ARM cortex microcontroller with its applications in embedded system.	L4
ET343.CO.4	Develop applications using ARM Cortex based microcontroller.	L4
Course Name and Course Code		IoT Architecture & Sensors (ET352)
ET352.CO.1	Apply the basic fundamental to build an IoT application	L3
ET352.CO.2	Analyze various M2M and IoT architectures	L4
ET352.CO.3	Create IoT solutions using sensors, actuators and Devices	L5
ET352.CO.4	Analyze the IoT data with the help of Cloud Computing	L3
ET352.CO.5	Analyze IoT platform design methodology and its constraints	L3
Course Name and Course Code		Skill Development Course: Data Science (ET345)
ET345.CO.1	Apply python programming concepts	L3
ET345.CO.2	Relate basic concepts of algebra, calculus and statistics	L2
ET345.CO.3	Apply different data visualization libraries and feature engineering techniques	L3
Course Name and Course Code		Power Electronics (ET361)
ET361.CO.1	Design and implement a triggering / gate drive circuit for power converters.	L4
ET361.CO.2	Design and analyze different power electronic converters.	L4
ET361.CO.3	Analyze various power quality issues and their remedies.	L3
ET361.CO.4	Analyze applications of power electronics.	L3

CO's	CO Statement	BT Level
Course Name and Course Code		Principles of Communication Systems (ET362)
ET362.CO.1	Illustrate the fundamental concepts and terminologies of communication systems	L2
ET362.CO.2	Inspect different analog modulation, demodulation schemes along with transmitter and receiver circuitry	L4
ET362.CO.3	Explain the concept of random variables and processes with statistical parameters	L3
ET362.CO.4	Analyze various source and channel coding methods	L4
ET362.CO.5	Examine optimum receiving techniques and error performances of digital modulation schemes	L4
Course Name and Course Code		Soft Computing (ET363)
ET363.CO.1	Explain fundamentals of machine learning.	L2
ET363.CO.2	Describe supervised and unsupervised learning.	L2
ET363.CO.3	Analyze mathematically various machine learning approaches and paradigms.	L3
ET363.CO.4	Implement machine learning solutions for classification, regression, and clustering problems.	L4
ET363.CO.5	Compare various machine learning techniques and to get an insight of when to apply a particular machine learning approach.	L4
Course Name and Course Code		IoT Network and Protocols (ET372)
ET372.CO.1	Interpret fundamentals underlying principles of networking	L2
ET372.CO.2	Prioritize networking protocol as per the real time applications	L3
ET372.CO.3	Articulate the cryptography techniques used in network security	L3
ET372.CO.4	Defend various security parameters related to network	L4
Course Name and Course Code		Skill Development Course - Networking (ET364)
ET364.CO.1	Assign various IP address in network	L3
ET364.CO.2	Install and configure the web server	L4
ET364.CO.3	Configure network for routing and switching	L4
Course Name and Course Code		Robot Fundamentals and Kinematics (ME352)
ME352.CO.1	List the key components of Industrial robot	L1
ME352.CO.2	Classify , sensors and actuators of industrial robots.	L2
ME352.CO.3	Select transmission system for robots.	L4
ME352.CO.4	Apply the kinematics and Inverse kinematics principles to robot	L3
ME352.CO.5	Determine Trajectory for given robot.	L5
ME352.CO.6	Build the task based robot by applying knowledge of sensors, actuators	L6

CO's	CO Statement	BT Level
Final Year, BTech (Electronics and Telecommunication Engineering)		
Course Name and Course Code		HDL-Digital Circuit Design (ET461)
ET461.CO.1	Analyse different architectures of PLDs	L4
ET461.CO.2	Comprehend the basic concepts of Verilog	L2
ET461.CO.3	Model digital circuits with Verilog, simulate, synthesis and prototype in PLDs.	L4
ET461.CO.4	Examine verification types and associated parameters	L3
Course Name and Course Code		Deep Learning (ET481)
ET481.CO.1	Explain fundamentals of Neural Network and Deep Learning	L2
ET481.CO.2	Describe Convolution Neural Network	L2
ET481.CO.3	Explain Sequence Model and Encoder Decoder Model	L2
ET481.CO.4	Develop Deep Learning model for classification and object detection	L3
ET481.CO.5	Evaluate the performance of Deep Learning models	L5
Course Name and Course Code		Digital Image Processing (ET482)
ET482.CO.1	Illustrate the fundamental concepts and process of image processing	L2
ET482.CO.2	Construct an algorithm for spatial and frequency domain filtering	L2
ET482.CO.3	Determine various image compression and segmentation techniques	L4
ET482.CO.4	Examine digital image processing techniques to real world applications	L3
ET482.CO.5	Analyze the problems in the field of robotics and other applications	L3
Course Name and Course Code		Electric Vehicle (ET483)
ET483.CO.1	Model vehicle parameters	L3
ET483.CO.2	Explore the EV motors and their controllers	L2
ET483.CO.3	Develop the battery modelling and its parameters	L3
ET483.CO.4	Illustrate the Model Based Development using MATLAB and SIMULINK	L2
ET483.CO.5	Analyse different Electric vehicle case studies	L4
Course Name and Course Code		RTOS (ET484)
ET484.CO.1	Explain the characteristics of real-time embedded applications	L2
ET484.CO.2	Interpret the RTX Kernel Structure	L2
ET484.CO.3	Apply Scheduling and synchronization in RTX	L3
ET484.CO.4	Utilize the inter task communication in RTX for an application	L3
ET484.CO.5	Summarize popular RTOS available for different applications	L2

CO's	CO Statement	BT Level
Course Name and Course Code		Data Management & Analytics (ET472)
ET472.CO.1	Demonstrate the data lifecycle	L2
ET472.CO.2	Apply basic concepts of database management system	L3
ET472.CO.3	Apply basic operations with DBMS	L3
ET472.CO.4	Infer the importance of the domain context for data analytics	L2
ET472.CO.5	Illustrate basic concepts of big data analytics and their components	L2
ET472.CO.6	Analyze the database system design, implementation, and maintenance	L4
Course Name and Course Code		Skill DevelopmentCourse: EmbeddedLinux Systems (ET463)
ET463.CO.1	Explore the features of Linux through command line and shell programming	L2
ET463.CO.2	Demonstrate the usage of file system in Linux	L3
ET463.CO.3	Apply toolchain in the embedded Linux environment	L3
ET463.CO.4	Design the various device drivers for embedded application	L4
Course Name and Course Code		Skill DevelopmentCourse: System Modelling (ET465)
ET465.CO.1	Implement methodology to improve efficiency of MATLAB programming code	L4
ET465.CO.2	Exploit the concept of OOP in MATLAB	L3
ET465.CO.3	Create an application using App Designer	L6
ET465.CO.4	Build a system model in electrical, mechanical and power domain	L6
ET465.CO.5	Design a user friendly application	L6
Course Name and Course Code		Biomedical Engineering (EX441)
EX441.CO.1	Elaborate the origin of various bio-signals and the electrodes used to measure them.	L2
EX441.CO.2	Illustrate the various biomedical and radiological instruments	L3
EX441.CO.3	Apply the knowledge of electrical safety while designing.	L3
EX441.CO.4	Apply the knowledge of biotelemetry and telemedicine in the fields of biomedical.	L4
EX441.CO.5	Apply the concept of biomechanics and biomaterial in biomedical Engineering.	L4

Course Outcomes

B. Tech

(Information Technology)

(2019 – 2023)



CO's	CO Statement	BT Level
Second Year, BTech (Information Technology)		
Course Name and Course Code :- Data Structures (CS221)		
CS221.CO.1	Explain the concept of data structure.	L2
CS221.CO.2	Develop efficient algorithm for a given problem.	L3
CS221.CO.3	Analyze appropriate algorithm for solving the real world problem	L4
CS221.CO.4	Demonstrate advantages and disadvantages of data structures for variety of problems.	L3
CS221.CO.5	Choose effective data structures in approaching a problem solution	L2
CS221.CO.6	Make use of appropriate sorting and searching algorithm for a given application.	L3
Course Name and Course Code :- Computer Graphics (CS223)		
CS223.CO1	To explain different graphics primitives	L2
CS223.CO2	To apply related mathematical concepts to develop Computer graphics operations	L3
CS223.CO3	To demonstrate 2D and 3D transformation	L3
CS223.CO4	To apply various methods for projection	L3
CS223.CO5	To illustrate programs on clipping algorithms	L2
CS223.CO6	To develop animation and gaming application	L3
Course Name and Course Code :- DIG PROTO (ET224)		
ET206.CO1	Consolidate the techniques, skills and modern engineering tools.	L2
ET206.CO2	Apply acquired skills to the construction of a prototype project.	L3
ET206.CO3	Develop a prototype project by performing tasks in team.	L4
ET206.CO3	Demonstrate the work carried out in a team.	L3
Course Name and Course Code :- # JAVA Skill (CS227L)		
CS227.CO1	Implement Object Oriented Programming Concepts in java	L3
CS227.CO2	Use and create packages and interfaces in Java.	L3
CS227.CO3	Use graphical user interface in Java programs.	L3
CS227.CO4	Perform file handling operations.	L2
CS227.CO5	Implement exception handling in Java.	L3
CS227.CO6	Implement applications using JDBC .	L3
Course Name and Course Code :- #CPP Skill (CS226L)		
CS226.CO.1	Make use of class and objects using C++.	L3
CS226.CO.2	Demonstrate control structures using C++.	L2
CS226.CO.3	Implement the programs using data structures in C++.	L3
CS226.CO.4	Develop solution for real world problems using inheritance and polymorphism.	L3
CS226.CO.5	Apply standard template library to solve real world instances.	L3
CS226.CO.6	Make use of various file handling and exception handling operations in C++.	L3

CO's	CO Statement	BT Level
Course Name and Course Code :- Engineering Informatics (IT221)		
IT221.CO.1	Interpret Data, Information and Knowledge.	L2
IT221.CO.2	Make use of data acquisition techniques for an information system.	L3
IT221.CO.3	Categories different storage techniques.	L4
IT221.CO.4	Develop dashboard for effective communication of information.	L3
IT221.CO.5	Determine components of Human computer interaction.	L5
IT221.CO.6	Model IoT based information system.	L4
Course Name and Course Code :- Discrete Structure and Graph Theory (CS211)		
CS211.CO1	To learn logic and proof techniques to explore mathematical reasoning	L2
CS211.CO2	To formulate the problems precisely and solve the problems.	L3
CS211.CO3	To use appropriate set, function, or relation models to analyze practical examples.	L3
CS211.CO4	Model and analyze computational processes using combinatorial methods.	L3
CS211.CO5	To explore number of logical possibilities and algebraic structures.	L2
CS211.CO6	To use graph theory and associated terminology in practical example.	L3
Course Name and Course Code :- Applied Mathematics (AS201)		
AS201.CO1	Evaluate the rank of a matrix and solve the system of equations.	L3
AS201.CO2	Determine the eigenvalues and eigenvectors of a matrix.	L2
AS201.CO3	Differentiate a vector valued function in plane or space.	L2
AS201.CO4	Compute the area and volume of the objects.	L2
AS201.CO5	Apply the Cauchy's Integral Theorem and evaluate the integrations.	L3
AS201.CO6	Execute the program codes using MATLAB.	L4
Course Name and Course Code :- Minor Project- Design (CS230)		
CS230.CO1	Delineate the problem to be solved.	L2
CS230.CO2	Comprehend the paramount of the health, safety and welfare of the public in the practice of engineering profession.	L3
CS230.CO3	Embark project planning and design.	L4
CS230.CO4	Inculcate problem solving skills and critically analyze the options available to solve the problem	L4
CS230.CO5	Cognize the importance of documentation and report writing.	L3
Course Name and Course Code :- Database Management System (CS231)		
CS231.CO1	Perform basic operation with DBMS.	L2
CS231.CO2	Design and develop database application using ER diagram and normalization.	L3
CS231.CO3	Implement validation framework like integrity constraints and trigger.	L4
CS231.CO4	Apply ACID properties for transaction management.	L3
CS231.CO5	Explain concurrency control mechanism using lock based and timestamp based protocol	L2
CS231.CO6	Execute the basic operation on NoSQL database	L3

CO's	CO Statement	BT Level
Course Name and Course Code :- Advanced Data Structures (CS228)		
CS228.CO.1	Explain the working of basic and advanced data structures like trees, graphs, heaps, disjoint sets, hash tables, bloom filters.	L2
CS228.CO.2	Demonstrate the advantages and disadvantages of various data structures.	L3
CS228.CO.3	Choose appropriate data structures while building the applications.	L3
CS228.CO.4	Implement various applications using data structures like trees, graphs, hash tables, heaps.	L3
CS228.CO.5	Evaluate the performance of various data structures in terms of time and memory complexity .	L5
CS228.CO.6	Design own data structures using the build in data structures.	L6
Course Name and Course Code :- Computer Organization & Architecture (CS229)		
CS228.CO.1	Explain the architecture of the microprocessor 80386.	L2
CS228.CO.2	Develop assembly language programs using 32/64 bit registers	L3
CS228.CO.3	Illustrate Control unit and IO organizations	L2
CS228.CO.4	Explain the memory organization in the computer system	L2
CS228.CO.5	Illustrate arithmetic operations.	L2
CS228.CO.6	Explain Pipelining processing environment.	L2
Course Name and Course Code :- Professional Skill (HP202)		
HP202.CO1	Express themselves effectively in routine and real-world interactions through oral and written communication.	L3
HP202.CO2	Show Confident Public Speaking skills	L5
HP202.CO3	To showcase leadership qualities during tough tasks, make decisions and actions effectively within time.	L5
Course Name and Course Code :- Programming Lab (CS224)		
CS224.CO1	Explain the concept of data structure.	L2
CS224.CO2	Develop efficient algorithm for a given problem.	L3
CS224.CO3	Analyze appropriate algorithm for solving the real world problem.	L4
CS224.CO4	Demonstrate advantages and disadvantages of data structures for variety of problems.	L3
CS224.CO5	Choose effective data structures in approaching a problem solution.	L2
CS224.CO6	Make use of appropriate sorting and searching algorithm for a given application.	L3
Course Name and Course Code :- Minor Project - Implementation (CS240)		
CS240.CO1	Select appropriate method for making of solution.	L1
CS240.CO2	Compare various engineering tools/technique to develop solution.	L2
CS240.CO3	Justify the selected method/tools opted for making of solution.	L2
CS240.CO4	Develop tangible solution to dened problem.	L5
CS240.CO5	Test the developed solution.	L4
CS240.CO6	Document solution in the form of Project report / IPR drafts.	L3

CO's	CO Statement	BT Level
Third Year, BTech (Information Technology)		
Course Code and Course Name :- Operating System (CS341)		
CS341.CO1	Illustrate the role of OS in the management of system	L2
CS341.CO2	Organize process and threads execution in operating system effectively	L3
CS341.CO3	Identify deadlock to resolve the related issues.	L3
CS341.CO4	Analyze the memory management and its allocation policies	L4
CS341.CO5	Make use of the file system, protection and security aspects of OS effectively	L3
Course Code and Course Name :- Theory of Computation (CS342)		
CS342.CO1	Differentiate between types of languages and respective recognition automata.	L2
CS342.CO2	Construct various types of automata and grammar from language and vice versa.	L3
CS342.CO3	Make use of the properties of languages and automata to design complex automata prove equivalence of automata	L3
CS342.CO4	Decide the type of automata to be used to recognize the particular language.	L5
CS342.CO5	Identify decidability of languages.	L3
Course Code and Course Name :- Minor Project - Implementation (CS343)		
CS343.CO1	Comprehend signals and communications types.	L2
CS343.CO2	Build different types of network topologies and protocols.	L2
CS343.CO3	Evaluate routing protocols for different real time systems.	L4
CS343.CO4	Analyze connection oriented and connectionless services.	L3
CS343.CO5	Demonstrate different application/systems related to networking.	L5
Course Code and Course Name :- Descriptive Analytics (CS351)		
CS351.CO1	Outline the data warehouse architecture. (Understanding-L2)	L2
CS351.CO2	Build data marts using different modeling techniques for given application(Apply-L3)	L3
CS351.CO3	Create OLAP cubes and Visualize data using visualizing tools.(Apply-L3)	L3
CS351.CO4	Recognize trends, detect outliers, and summarize data sets(Apply-L3)	L3
CS351.CO5	Validate hypothesis using various testing methods for a real-life problem statement(Evaluate-L4)	L4
CS351.CO6	Predict output by applying correct regression model.(Apply-L3)	L3
Course Code and Course Name :- Artificial Intelligence (CS352)		
CS352.CO1	Apply basic principles of knowledge representation, inference and reasoning in Artificial Intelligence[L3].	L3
CS352.CO2	Apply problem solving and searching techniques of Artificial Intelligence to reach desired goals [L3].	L3
CS352.CO3	Analyze appropriate methods of Machine Learning based on the particular characteristics of the domains and applications under consideration[L4].	L4
CS352.CO4	Accurately formulate, test and evaluate hypothesis and performance of machine learning algorithms[L4].	L4

CO's	CO Statement	BT Level
Course Code and Course Name :- Cloud Computing Foundations (CS353)		
CS353.CO1	To classify various cloud computing services and models	L2
CS353.CO2	To build various compute services in cloud	L3
CS353.CO3	To distinguish between various storage related services used during application development	L4
CS353.CO4	To select appropriate database service during application development	L3
CS353.CO5	To choose various networking and security options during application development	L3
CS353.CO6	To estimate the resource requirements for the application with high availability and reliability features	L5
Course Code and Course Name :- Cryptography & System Security (IT351)		
IT351.CO1	Identify the security threats, and the security services and mechanisms to counter them [L3].	L3
IT351.CO2	Apply security principles to protect the data.[L3]	L3
IT351.CO3	Analyze symmetric key and asymmetric key algorithm. [L4]	L4
IT351.CO4	Identify the different Authentication method in digital signature [L3]	L3
IT351.CO5	Analyze network security protocols [L4].	L4
IT351.CO6	Identify and investigate network security threat and provide solution to protect the network [L3].	L3
Course Code and Course Name :- Project Management (CS361)		
CS361.CO1	Identify the Project Management Knowledge Areas and Processes	L1
CS361.CO2	Classify the responsibilities while designing the Project Master Plan	L2
CS361.CO3	Outline the Cost Estimating and Cost Escalation Process	L2
CS361.CO4	Demonstrate and highlight The Processes of Project Quality Management	L3
CS361.CO5	Analyze Project Management Maturity and Maturity Models	L4
Course Code and Course Name :- Skill Development :WebTechnology (CS346)		
CS346.CO1	To understand the concepts and principles of web applications and development.	L2
CS346.CO2	To apply current web technologies and web business models.	L3
CS346.CO3	To understand and apply Web development processes.	L3
CS346.CO4	To understand the world wide web client-server request and response.	L2
Course Code and Course Name :- Skill Development Red Hat Linux (CS344)		
CS344.CO1	Illustrate essential Linux administration tasks.	L2
CS344.CO2	Experiment with installation, networking and user profile files.	L3
CS344.CO3	Examine physical storage, file systems and log files.	L3
CS344.CO4	Inspect the Linux processes, control services, daemons and basic security administration.	L3
CS344.CO5	Analyze Redhat Linux System with a comprehensive and systematic approach.	L4

CO's	CO Statement	BT Level
Course Code and Course Name :- Project Design (CS350)		
CS350.CO1	Delineate the problem to be solved.	L3
CS350.CO2	Inculcate problem solving skills by critically analyzing real world needs, possible solutions and challenges.	L4
CS350.CO3	Carry out systematic literature review, planning and project design.	L4
CS350.CO4	Cognize the importance of documentation and report writing.	L3
Course Code and Course Name :- Design and Analysis of Algorithms (CS347)		
CS347.CO1	Make use of the Five problem solving strategy to design an algorithm.	L3
CS347.CO2	Analyze the given algorithm in terms of its computational complexity.	L4
CS347.CO3	Apply prior knowledge of standard algorithm to solve new problem.	L3
CS347.CO4	Evaluate the intractable problems using approximation algorithms.	L5
CS347.CO5	Compare various string matching Algorithms.	L2
Course Code and Course Name :- Software Engineering (CS349)		
CS349.CO1	Classify process models.	L2
CS349.CO2	Analyze conformance of the requirement related to project development.	L4
CS349.CO3	Develop design models using UML diagram.	L3
CS349.CO4	Mitigate the risk associated with project development.	L4
CS349.CO5	Evaluate the schedule, cost and staff associated with project.	L5
CS349.CO6	Review quality assurance through test driven development.	L4
Course Code and Course Name :- Compiler Design (CS348)		
CS348.CO1	Use different compiler construction tools to show the working of every compiler phase(L3)	L3
CS348.CO2	Demonstrate working of lexical analyser and parser by using FLEX & BISON(L3)	L3
CS348.CO3	Choose efficient parsing techniques for given grammar(L4)	L4
CS348.CO4	Develop Syntax Directed Translation Schemes for the given grammar(L6)	L6
CS348.CO5	Apply code generation and optimization techniques(L3)	L3
Course Code and Course Name :- Employability & Career Development (HP305)		
HP305.CO1	Relate the importance of Employability Career Development (L2)	L2
HP305.CO2	Build necessary, specific professional skills (L3)	L3
HP305.CO3	Analyze the environment of employability (L4)	L4
HP305.CO4	Develop various techniques of effective team building in their professional life (L6)	L6

CO's	CO Statement	BT Level
Course Code and Course Name :- Machine Learning (CS355)		
CS355.CO1	Design and implement various machine learning algorithms in a range of real-world applications	L3
CS355.CO2	Analysis of the fundamental issues and challenges of model selection and its complexity	L4
CS355.CO3	Make use of various algorithms for Natural Language Processing and Information Retrieval	L3
CS355.CO4	Decide appropriate methods for applications of machine learning in Computer Vision and Pattern Recognition.	L4
Course Code and Course Name :- Predictive Analytics (CS354)		
CS354.CO1	Analyze various Association Algorithms.	L3
CS354.CO2	Apply the classification and prediction techniques to solve real world problems.	L3
CS354.CO3	Use advanced classification techniques.	L3
CS354.CO4	Apply artificial neural network on a real application.	L3
CS354.CO5	Analyze the unsupervised learning methods.	L4
CS354.CO6	Apply the conceptual clustering and ensemble learning methods on a real-life	L3
Course Code and Course Name :- Cloud Native Application Development (CS356)		
CS356.CO1	To configure the software development kit for various AWS services	L3
CS356.CO2	To develop various compute services in cloud	L3
CS356.CO3	To access various database services through a web application	L3
CS356.CO4	To distinguish between protocols for developing own API	L4
CS356.CO5	To select an appropriate configuration for provisioning infrastructure as a code	L3
CS356.CO6	To develop a web application using various cloud services	L3
Course Code and Course Name :- Cyber Security & Forensic (CS352)		
CS352.CO1	Identify different cybercrimes and offences that can attack a network.	L1
CS352.CO2	Complete Implementing a secure wireless network in the organization.	L2
CS352.CO3	Articulate a secure network environment with the help of various network components.	L2
CS352.CO4	Illustrate the fundamental risk management principles related to Cyber intelligence.	L4
CS352.CO5	Analyze the Digital evidences and Digital Forensics Life Cycle.	L3
CS352.CO6	Evaluate the security vulnerabilities in the system with the help of forensics tools.	L4

CO's	CO Statement	BT Level
Course Code and Course Name :- SDL : Advanced Java (CS357)		
CS357.CO1	Construct java applications using multithreading and networking concepts	L3
CS357.CO2	Build web applications using Servlet, JSP.	L3
CS357.CO3	Explore JSF framework for the better user interfaces.	L2
CS357.CO4	Integrate Hibernate and spring framework with applications	L4
CS357.CO5	Develop advanced enterprise web applications	L4
Course Code and Course Name :- SDL: .DOT NET (CS358)		
CS358.CO1	Implement object-oriented programming and C# multitasking concepts(L3)	L3
CS358.CO2	Explore application development with C# 8.0 and .NET (L3)	L2
CS358.CO3	Design windows forms for different applications(L6)	L3
CS358.CO4	Use Entity Framework and work with relational databases(L3)	L3
CS358.CO5	Develop web applications using a combination of client-side and server-side technologies (L3)	L3
Course Code and Course Name :- SDL : RED HAT LINUX (CS359)		
CS349.CO1	Illustrate essential Linux administration tasks.	L2
CS349.CO2	Experiment with installation, networking and user profiles.	L3
CS349.CO3	Examine physical storage, file systems and log files.	L3
CS349.CO4	Inspect the Linux processes, control services, daemons and basic security administration.	L2
CS349.CO5	Analyze Redhat Linux System with a comprehensive and systematic approach.	L4
Course Code and Course Name :- Minor Project - Implementation (CS360)		
CS360.CO1	Analyze techniques, algorithms and design process related to the project.	L4
CS360.CO2	Infer conclusions by implementing/developing/experimenting/simulating/testing the different techniques/processes.	L4
CS360.CO3	Cognize the importance of documentation and report writing.	L3

CO's	CO Statement	BT Level
Final Year, BTech (Information Technology)		
Course Code and Course Name :- Distributed Systems (CS481)		
CS481.CO1	Identify the goals of Distributed System for a particular Architecture type.	L2
CS481.CO2	Implement the MPI programs for distributed system applications.	L3
CS481.CO3	Differentiate between different clock synchronization algorithms.	L3
CS481.CO4	Choose appropriate algorithms for incorporating replication and consistency in the given distributed system application.	L5
CS481.CO5	Decide fault tolerance mechanism to be used for particular distributed system application	L5
CS481.CO6	Explain distributed File System with reference to scalability, concurrency, transparency, replication and Fault Tolerance.	L2
Course Code and Course Name :- Wireless and Mobile Networks (CS472)		
CS472.C01	Determine issues and challenges in Wireless Networks.	L3
CS472.C02	Categories different types of wireless networks.	L4
CS472.C03	Determine issues and challenges of Mobile Ad-Hoc Networks.	L3
CS472.C04	Assessing the features of Mobile Ad-Hoc Networks.	L3
CS472.C05	Assessing the features of Wireless Sensor Networks.	L3
CS472.C06	Apply different security algorithms in wireless Network.	L3
Course Code and Course Name :- Information Retrieval (CS473)		
CS473.CO1	Understand the process of representing, retrieving and analyzing IR models and advanced IR models.	L2
CS473.CO2	Understand structure of web and working of crawlers	L2
CS473.CO3	Develop IR models form standard IR models	L6
CS473.CO4	Demonstrate the standard methods for web indexing and evaluation	L3
CS473.CO5	To analyze optimization techniques & various algorithms used in web search	L4
Course Code and Course Name :- Computer Vision (CS477)		
CS477.CO1	Explain image formation and operations.	L2
CS477.CO2	Implement Binary Image Processing operations.	L3
CS477.CO3	Compare different image enhancement and feature extraction techniques.	L3
CS477.CO4	Apply methods of computer vision for image segmentation and recognition.	L3
CS477.CO5	Identify the design requirement of video processing.	L2
CS477.CO6	Suggest a design of a computer vision system for a specific problem.	L5
Course Code and Course Name :- Skill Development Course - Android Application Development (CS456)		

CO's	CO Statement	BT Level
CS456.CO1	Learn Android application development tools and environment.	L2
CS456.CO2	Prepare User Interfaces for the Android platform.	L3
CS456.CO3	Apply SQLite light weight database and store information in persistence storage	L3
CS456.CO4	Create various Layouts and Widgets in Android Applications	L4
CS456.CO5	Build Android application	L5
Course Code and Course Name :- Skill Development Course - AWS Cloud Services (CS485)		
CS485.CO1	Define different types of cloud computing models and review the AWS Cloud Adoption Framework (AWS CAF)	L2
CS485.CO2	Create VPC and add additional components to produce customized network	L5
CS485.CO3	Demonstrate when to use AWS Elastic Beanstalk, AWS Lambda.	L2
CS485.CO4	Implement Amazon RDS database such as launching, configuring and interacting.	L3
CS485.CO5	Design and configure different types of security credentials in IAM	L5
Course Code and Course Name :- Ethical Hacking (IT461)		
IT461.CO1	Describe hacking concepts, and scopes.	L2
IT461.CO2	Apply different approaches to perform Footprinting through search engine, web and network sites.	L3
IT461.CO3	Analyze vulnerability assessment reports.	L3
IT461.CO4	Apply different techniques to privilege escalation and gain the access to a system.	L4
IT461.CO5	Perform various web server attacks its countermeasures.	L2
IT461.CO6	Demonstratedifferent techniques to perform various web application attack.	L5
Course Code and Course Name :- Big Data Analytics (CS461)		
CS461.CO1	Prepare for data summarization, query, and analysis.	L2
CS461.CO2	Apply data modeling techniques to large data sets.	L3
CS461.CO3	Inspect applications for Big Data analytics.	L4
CS461.CO4	Build a complete business data analytic solution.	L5
Course Code and Course Name :- Deep Learning (CS462)		
CS462.CO1	Understand the fundamentals of deep learning.	L2
CS462.CO2	Recognize significances of deep learning algorithms to handle high dimensional data.	L2
CS462.CO3	Interpret the application requirements in field of Computer vision and Natural language processing.	L3
CS462.CO4	Analyze experimental results of different algorithms in deep learning.	L4
CS462.CO5	Optimize algorithms using various approaches to improve performance of model.	L5
CS462.CO6	Assemble variety of deep learning algorithm to develop the model.	L5
Course Code and Course Name :- Cloud Native Apps (CS463)		

CO's	CO Statement	BT Level
CS463.CO1	To develop the automated the SDLC Process	L5
CS463.CO2	To summerize the various advanced facilities available to launch infrastructure using cloudformation.	L2
CS463.CO3	To differentiate between AWS Elastic Container Service, AWS Fargate and AWS Elastic Kubernetes Service.	L2
CS463.CO4	To implement the various policies and standards required for automation.	L3
CS463.CO5	To design the systems with detailed plan for High Availability and Disaster Recovery.	L4
CS463.CO6	To develop a infrastructure using Jenkins.	L5

Course Outcomes

B. Tech

(Mechanical Engineering)

(2019 – 2023)



CO's	CO Statement	BT Level
Second Year, BTech (Mechanical Engineering)		

Course Name and Course Code	Strength of Materials (ME231)	
ME231.CO.1	Memorize the fundamental concepts including static equilibrium, geometry of deformation, and material constitutive behavior.	L1
ME231.CO.2	Understand the concept of resistance, deformation and thermal stresses and Principal Stresses.	L2
ME231.CO.3	Construct shear forces and bending moment diagrams for different beams under various loads.	L6
ME231.CO.4	Analyze concept of Slope and Deflections, Bending and Shear stresses in beams for solving numerical.	L4
ME231.CO.5	Judge suitable dimensions for Column, solid and hollow circular shafts for mechanical systems.	L5
Course Name and Course Code	Thermal Engineering (ME232)	
ME232.CO.1	Apply the basic concepts and laws of thermodynamics to various thermal processes and real systems.	L3
ME232.CO.2	Formulate performance of various thermodynamic gas power cycles.	L6
ME232.CO.3	Evaluate performance characteristics of IC engine and recent IC engine technologies.	L5
ME232.CO.4	Examine the quality of steam and performance of steam generators	L4
Course Name and Course Code	Manufacturing Technology (ME233)	
ME233.CO.1	Illustrate the working of various conventional manufacturing machines.	L3
ME233.CO.2	Choose proper tools and various machining parameters for manufacturing.	L3
ME233.CO.3	Demonstrate the working of various Machines like CNC, VMC, HMC.	L3
ME233.CO.4	Outline the concept of digital manufacturing.	L2
Course Name and Course Code	Digital Prototyping (ET224)	
ET224.CO.1	Consolidate the techniques, skills and modern engineering tools.	L3
ET224.CO.2	Apply acquired skills to the construction of a prototype project.	L3
ET224.CO.3	Develop a prototype project by performing tasks in team	L6
ET224.CO.4	Demonstrate the work carried out in a team.	L3
Course Name and Course Code	Industrial Measurements & Instrumentation (ME241)	
ME241.CO.1	Identify the correct measuring instruments for different measurements.	L2
ME241.CO.2	Summarize different types of Limits, Fits and tolerances.	L1
ME241.CO.3	Demonstrate industrial measurements using suitable instruments.	L3
ME241.CO.4	Estimate dimensions of complex geometries like groove, pitch diameter using electronic height gauge.	L5
ME241.CO.5	Verify the accuracy of measuring instruments.	L5

CO's	CO Statement	BT Level
Course Name and Course Code		Minor Project- Design (ME230)
ME230.CO.1	Delineate the problem to be solved	L2
ME230.CO.2	Comprehend the paramount of the health, safety and welfare of the public in the practice of engineering profession.	L2
ME230.CO.3	Embark project planning and design.	L1
ME230.CO.4	Inculcate problem solving skills and critically analyze the options available to solve the problem.	L3
ME230.CO.5	Cognize the importance of documentation and report writing.	L2
Course Name and Course Code		Environmental Science (CV203)
CV203.CO.1	summarize the importance of ecosystem and biodiversity for maintaining ecological balance	L2
CV203.CO.2	identify environmental problems arising due to engineering and technological activities and the science behind those problems	L2
CV203.CO.3	categorize the major pollutants along with sources and abatement devices for the environmental management	L4
CV203.CO.4	analyze material balance for different environmental systems	L4
CV203.CO.5	perceive the social and professional responsibility towards the environment	L1
CV203.CO.6	appraise the environmental factors so as to ensure sustainable development	L5
Course Name and Course Code		Materials Engineering (ME221)
ME221.CO.1	Relate the applications of various engineering materials and heat treatment processes in material processing industry.	L2
ME221.CO.2	Interpret the specifications, composition, concepts and fundamental properties of engineering materials applied in industrial/research field	L3
ME221.CO.3	Select the suitable materials, manufacturing process for specified application to meet the product performance requirements within its product service life.	L2
ME221.CO.4	Analyze the suitable material testing and characterization technique to ensure service life for specific product without any failure or deterioration in its performance	L4
Course Name and Course Code		Machines & Mechanisms (ME234)
ME234.CO.1	State the concept of degrees of freedom and select suitable mechanisms for the engineering applications	L1
ME234.CO.2	Determine kinematic analysis (Velocity, acceleration, Inertia forces) for a given mechanism using graphical methods	L3
ME234.CO.3	Calculate the velocity ratios of belt and rope drives with analytical methods and suggest suitable applications	L3
ME234.CO.4	Sketch different types of cam profiles for a given follower motions using drawing tools	L3
ME234.CO.5	Solve the numericals based on simple and epicyclic gear trains using formula methods	L3
ME234.CO.6	Analyze the effect of gyroscopic couple and turning moment diagrams for flywheel.	L4

CO's	CO Statement	BT Level
Course Name and Course Code		Fluid Mechanics (ME235)
ME235.CO.1	Interpret the properties and behavior of the fluid at rest and in motion	L3
ME235.CO.2	Explain different parameters related to fluid kinematics to visualize the fluid flow.	L2
ME235.CO.3	Utilize different equations of fluid flow to compute the velocity and discharge.	L3
ME235.CO.4	Analyze the laminar and turbulent internal flows considering the losses	L4
ME235.CO.5	Evaluate various parameters related to the flow around immersed bodies and present the governing equation in non dimensional form.	L5
Course Name and Course Code		Engineering Informatics (ME222)
ME222.CO.1	Understand data and its types, information and knowledge of information life cycle (ILC).	L2
ME222.CO.2	Make use of sensors, data acquisition systems (DAS) and design of experiment (DoE).	L6
ME222.CO.3	Identify various data storage, data transmission, data analysis, data prediction and optimization techniques.	L2
ME222.CO.4	Learn in depth knowledge of data/information visualisation and hands on experience on various data management and visualisation techniques.	L2
ME222.CO.5	Understand the human computer interaction (HCI) system and computation techniques	L2
ME222.CO.6	Design of IoT based information system	L6
Course Name and Course Code		Rapid Prototyping (ET235)
ET235.CO.1	Consolidate the techniques, skills and modern engineering tools.	L3
ET235.CO.2	Apply acquired skills to the construction of a prototype project	L3
ET235.CO.3	Develop a prototype project by performing tasks in team.	L6
ET235.CO.4	Demonstrate the work carried out in a team.	L3
Course Name and Course Code		Professional Skills (HP 202)
HP202.CO.1	Express themselves effectively in routine and real-world interactions through verbal and written communication.	L3
HP202.CO.2	Show Confident Public Speaking skills.	L3
HP202.CO.3	To showcase leadership qualities during tough tasks, make decisions and actions effectively within time.	L3
Course Name and Course Code		Minor Project- Implementation (ME 240)
ME240.CO.1	Select appropriate method for making of solution.	L4
ME240.CO.2	Compare various engineering tools/technique to develop solution.	L4
ME240.CO.3	Justify the selected method/tools opted for making of solution.	L2
ME240.CO.4	Develop tangible solution to defined problem.	L6
ME240.CO.5	Test the developed solution.	L4
ME240.CO.6	Document solution in the form of Project report / IPR drafts.	L2

CO's	CO Statement	BT Level
Course Name and Course Code	Liberal Learning (HP203)	
HP203.CO.1	Develop a skill in the domain of their interest.	L6
HP203.CO.2	Demonstrate the skills learnt in the course.	L2
HP203.CO.3	Apply the concepts learnt in real-life situations.	L3

CO's	CO Statement	BT Level
Third Year, BTech (Mechanical Engineering)		

Course Name and Course Code		Machine Design (ME341)
ME341.CO.1	Recall fundamental Design procedure and Design parameters for machine Elements.	L1
ME341.CO.2	Illustrate Design Procedure of the Machine Elements considering failure criterias.	L3
ME341.CO.3	Identify the various stresses induced in a machine elements for safer dimensions.	L2
ME341.CO.4	Examine the stresses induced in machine elements for various failure modes.	L4
ME341.CO.5	Determine the optimum and reliable solutions for the Mechanical Engineering problems based on required criterias.	L3
Course Name and Course Code		Turbomachines (ME342)
ME342.CO.1	Classify the different turbo machines. [L1]	L2
ME342.CO.2	Illustrate energy transfer in turbo machines using thermo-fluid dynamics equation. [L2]	L3
ME342.CO.3	Model rotating element of turbo machines. [L3]	L3
ME342.CO.4	Analyse the overall performance of turbo machines. [L4]	L4
ME342.CO.5	Recommend the suitable turbo machines for required application. [L5]	L5
Course Name and Course Code		Hydraulics & Pneumatics (ME343)
ME343.CO.1	Recognize principle of various components used for hydraulic & pneumatic systems.[L1]	L1
ME343.CO.2	Draw control circuits for hydraulic and pneumatic systems.[L3]	L3
ME343.CO.3	Evaluate different industrial applications of hydraulic and pneumatic system.[L5]	L5
ME343.CO.4	Design hydraulic circuits for industrial applications.[L4]	L4
ME343.CO.5	Troubleshooting of hydraulic & pneumatic circuits through Automation studio software.[L5]	L5
Course Name and Course Code		Finite Element Analysis (ME351)
ME351.CO.1	Explain the fundamentals of finite element method. [L2]	L2
ME351.CO.2	Formulate simple problems into finite elements. [L3]	L3
ME351.CO.3	Solve for modeling and meshing of structural problems. [L3]	L3
ME351.CO.4	Derive element matrix equation by different methods by applying basic laws in mechanics and integration by parts. [L4]	L4
ME351.CO.5	Use professional-level finite element software to solve engineering problems in Solid me- chanics. [L5]	L5

CO's	CO Statement	BT Level
Course Name and Course Code		Automobile System Design (ME354)
ME354.CO.1	To identify and visualize automotive parts [L1]	L2
ME354.CO.2	To select and design the different automobile system for given situation [L2]	L2
ME354.CO.3	To standardize the different parts according to norms [L3]	L3
ME354.CO.4	To optimize the parts for given condition [L4]	L4
Course Name and Course Code		Robot Fundamentals and Kinematics (ME352)
ME352.CO.1	List the key components of Industrial robot. [L1]	L1
ME352.CO.2	Classify, sensors and actuators of industrial robots. [L2]	L2
ME352.CO.3	Select transmission system for robots. [L4]	L2
ME352.CO.4	Apply the kinematics and Inverse kinematics principles to robot. [L3]	L3
ME352.CO.5	Determine the Trajectory of the given robot. [L5]	L5
ME352.CO.6	Build the task based robot by applying knowledge of sensors, actuators.[L6]	L3
Course Name and Course Code		Project Management (CS361)
CS361.CO.1	Identify the Project Management Knowledge Areas and Processes.	L2
CS361.CO.2	Classify the responsibilities while designing the Project Master Plan.	L2
CS361.CO.3	Outline the Cost Estimating and Cost Escalation Process.	L2
CS361.CO.4	Demonstrate and highlight The Processes of Project Quality Management.	L3
CS361.CO.5	Analyze Management of a Project and Maturity Models.	L4
Course Name and Course Code		Computer Aided Product Design (ME371)
ME372.CO.1	Design solid parts. [L2]	L6
ME372.CO.2	Build assemblies. [L3]	L3
ME372.CO.3	Design intent applied to solid parts and assemblies. [L4]	L6
ME372.CO.4	Create sheet metal components. [L5]	L6
ME372.CO.5	Generate the NC program using software package. [L4]	L6
Course Name and Course Code		Project Design (ME350)
ME350.CO.1	Delineate the problem to be solved.	L2
ME350.CO.2	Inculcate problem solving skills by critically analyzing real world needs, possible solutions and challenges.	L3
ME350.CO.3	Carry out systematic literature review, planning and project design.	L2
ME350.CO.4	Cognize the importance of documentation and report writing.	L2

CO's	CO Statement	BT Level
Course Name and Course Code		Design of Transmission Systems (ME344)
ME344.CO.1	Recall fundamental Design procedure and Design parameters for Transmission System elements.	L1
ME344.CO.2	Illustrate Design Procedure of the Machine Elements considering failure criteria.	L3
ME344.CO.3	Identify the various stresses induced in a Transmission element for safer dimensions.	L2
ME344.CO.4	Examine the stresses induced in transmission elements for various failure modes.	L4
ME344.CO.5	Determine the optimum and reliable solutions for the Mechanical Engineering problems based on required criterias.	L3
Course Name and Course Code		Heat Transfer (ME346)
ME346.CO.1	Define the important modes of heat transfer and state their applications.	L1
ME346.CO.2	Compare the heat transfer rate of different thermal system.	L4
ME346.CO.3	Calculate heat transfer by conduction, convection and thermal radiation for real life applications.	L3
ME346.CO.4	Analyze heat transfer in thermal systems involving several heat transfer mechanisms.	L4
ME346.CO.5	Recommend suitable Heat Exchanger for any practical application.	L6
Course Name and Course Code		Quality Management (ME347)
ME347.CO.1	Identify different quality management principles.	L2
ME347.CO.2	Explain the different types tools used in quality management.	L2
ME347.CO.3	Describe different quality management systems.	L2
ME347.CO.4	Apply QC tools in solving industrial problems.	L3
ME347.CO.5	Prepare corrective action plan for given problems using value engineering techniques.	L3
Course Name and Course Code		Computational Fluid Dynamics (ME361)
ME361.CO.1	Summarize basic physical laws for numerical modeling in fluid flow and heat transfer. [L2]	L2
ME361.CO.2	Solve the governing equations in fluid flow and heat transfer by appropriate Discretiza tion Method. [L3]	L3
ME361.CO.3	Apply appropriate numerical scheme for basic fluid flow and heat transfer problems. [L3]	L3
ME361.CO.4	Develop a CFD code for basic fluid flow and heat transfer problems. [L4]	L6
Course Name and Course Code		Vehicle Dynamics (M364)
ME364.CO.1:	Understand the dynamics of vehicle ride.	L2
ME364.CO.2:	Apply aerodynamics to find airflow and pressure distribution on automobile.	L3
ME364.CO.3:	Calculate and refer the loads and forces associated to the vehicles.	L3
ME364.CO.4:	Analyze the behavior of the vehicles under acceleration, ride and braking.	L4

CO's	CO Statement	BT Level
Course Name and Course Code		Mechanical Simulations (ME381)
ME381.CO.1	Illustrate the fundamental ideas and concepts of the FEM and CFD.	L3
ME381.CO.2	Apply machine design, mechanics of materials, fluid mechanics, and heat transfer topics to provide preliminary results used for testing the CAE results.	L3
ME381.CO.3	Understand the modeling and meshing of structural, heat transfer and fluid problems.	L2
ME381.CO.4	Analyze complex geometries and loading states to validate with analytical solution.	L4
ME381.CO.5	Solve complex problems in solid mechanics and heat transfer using commercial CAE software.	L3
Course Name and Course Code		Employability and Career Development (HP305)
HP305.CO.1	Relate the importance of Employability Career Development (L2)	L2
HP305.CO.2	Build necessary, specific professional skills (L3)	L3
HP305.CO.3	Analyze the environment of employability (L4)	L4
HP305.CO.4	Develop various techniques of effective team building in their professional life (L6)	L6

CO's	CO Statement	BT Level
Final Year, BTech (Mechanical Engineering)		

Course Name and Course Code		Operation Research (ME471)
ME471.CO.1	Develop linear programming models and their solutions.	L6
ME471.CO.2	Apply Transportation and Assignment Models for real systems.	L3
ME471.CO.3	Investigate decision and game theory problems.	L4
ME471.CO.4	Analyses the network and scheduling problems.	L4
Course Name and Course Code		Mechanical Control System (ME472)
ME472.CO.1	Relate the principle of feedback control systems.	L1
ME472.CO.2	Develop the control circuits using a block & Signal flow diagram.	L3
ME472.CO.3	Evaluate and identify the PID controlled systems.	L5
ME472.CO.4	Construct basic PLC circuits for industrial applications using WinProladder software.	L4
ME472.CO.5	Classify DCS operation in Industrial control equipment.	L2
Course Name and Course Code		Mechanical System Design (ME473)
ME473.CO.1	Explore the difference between component level design and system level design.	L2
ME473.CO.2	Design various mechanical systems like pressure vessels, I. C. engine, material handling systems, etc. for the specifications stated/formulated.	L6
ME473.CO.3	Identify optimum design principles and apply it to mechanical components.	L2
ME473.CO.4	Optimize design for efficient performance	L6
ME473.CO.5	Apply the concept of system design.	L3
Course Name and Course Code		Sustainable Energy Development (ME 474)
ME474.CO.1	Evaluate Sustainability of renewable energy systems.	L5
ME474.CO.2	Elaborate energy Sustainability issues in India.	L2
ME474.CO.3	Estimate energy footprint.	L5
ME474.CO.4	Evaluate the role of green buildings in achieving sustainability.	L5
ME474.CO.5	Summarize circular economy concept.	L2
ME474.CO.6	Demonstrate sustainability using open LCA	L3
Course Name and Course Code		Artificial Intelligence (ME475)
ME475.CO.1	Apply basic principles of knowledge representation, inference and reasoning in Artificial Intelligence.[L3]	L3
ME475.CO.2	Apply the data analytics tools for data processing, regression and hypothesis testing, performance analysis. [L3]	L3
ME475.CO.3	Apply problem solving and searching techniques of Artificial Intelligence to reach desired goals. [L3]	L3
ME475.CO.4	Apply the AI algorithms to provide better solutions for the projects / problems under- taken. [L3]	L3

CO's	CO Statement	BT Level
Course Name and Course Code		Advanced Computational Fluid Dynamics (ME491)
ME491.CO.1	To formulate a CFD code for Nonlinear and Multi-Solid Conduction	L6
ME491.CO.2	To develop a CFD code for curvilinear grid generation and 2D unsteady heat conduction on a complex geometry	L6
ME491.CO.3	Apply appropriate computational Scheme to multiphase problems	L3
ME491.CO.4	Analyze Turbulence models to engineering fluid flow problems	L4
Course Name and Course Code		Autotronics and e-vehicles (ME494)
ME494.CO.1	Describe electronic control system components	L2
ME494.CO.2	Maintain automotive sensors and actuators	L1
ME494.CO.3	Diagnosis of fault codes in vehicle system	L4
ME494.CO.4	Selection and Application of BMS system in E-Vehicles	L2
Course Name and Course Code		Object Oriented Programming with Python (ME407)
ME407.CO.1	Apply conditional statement, loops condition and functions in python program.	L3
ME407.CO.2	Solve mathematical and mechanical problems using python program.	L3
ME407.CO.3	Plot various type of chart using python program.	L3
ME407.CO.4	Analyze the mechanical problem using python program.	L4
Course Name and Course Code		Refrigeration & Air Conditioning (ME461)
ME461.CO.1:	Explore fundamental principles of refrigeration cycles used in air conditioning and refrigeration systems. [L2]	L2
ME461.CO.2:	Apply concepts of non-conventional refrigeration principle and air-conditioning cycles in developing energy efficient cooling systems. [L3]	L3
ME461.CO.3:	Estimate different psychometric properties using psychometric chart to solve commercial cooling and heating problems. [L4]	L5
ME461.CO.4:	Analyze air-conditioning processes using the principles of Psychrometry. [L4]	L4
ME461.CO.5:	Calculate the load on the cooling coil and fix the supply conditions for various airconditioning systems. [L5]	L3
Course Name and Course Code		Capstone Portfolio (ME480)
ME480.CO.1:	Portray individual skill for solving the problem. (L4)	L4
ME480.CO.2:	Showcase and exhibit the best techniques and suitable methodology. (L5)	L5
ME480.CO.3:	Cognize the significance of report and comprehend its reflections. (L4)	L4
ME480.CO.4:	Assimilate digital and visual literacies. (L5)	L5