



MAHAGURU INSTITUTE OF TECHNOLOGY

Approved by AICTE and Affiliated to APJ Abdul Kalam Technological University

Accredited by NAAC with B+ Grade

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023

COUSE OUTCOME

ACADEMIC YEAR 2022-2023

SEMESTER 1&2

Course Code: MAT 101

Course Name: LINEAR ALGEBRA AND CALCULUS

Course Objectives	Subject Learning Outcomes or course outcomes
It is introduces students to some basic mathematical ideas and tools which are at the core of any engineering course. A brief course in Linear Algebra familiarises students with some basic techniques in matrix theory which are essential for analysing linear systems.	solve systems of linear equations, diagonalize matrices and characterise quadratic forms
The calculus of functions of one or more variables taught in this course are useful in modelling and analysing physical phenomena involving continuous change of variables or parameters and have applications across all branches of engineering.	compute the partial and total derivatives and maxima and minima of multivariable functions
	compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
	perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
	determine the Taylor and Fourier series expansion of functions and learn their applications

Course Code: MAT 102

Course Name: VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

Course Objectives	Subject Learning Outcomes or course outcomes
It introduces the concepts and applications of differentiation and integration of vector valued functions, differential equations, Laplace and Fourier Transforms	Compute the derivatives and line integrals of vector functions and learn their applications
The objective of this course is to familiarize the prospective engineers with some advanced concepts and methods in Mathematics which include the Calculus of vector valued functions, ordinary differential equations and basic transforms such as Laplace and Fourier Transforms which are invaluable for any engineer's mathematical tool box.	Evaluate surface and volume integrals and learn their inter-relations and applications
The topics treated in this course have applications in all branches of engineering	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients
	Compute Laplace transform and apply them to solve ODEs arising in engineering
	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering

Course Code: PHT 110

Course Name: ENGINEERING PHYSICS B (FOR NON-CIRCUIT BRANCHES)

Course Objectives	Subject Learning Outcomes or course outcomes
The Engineering Physics program is to offer students a solid background in the fundamentals of Physics and to impart that knowledge in engineering disciplines.	Compute the quantitative aspects of waves and oscillations in engineering systems.
The program is designed to develop scientific attitudes and enable the students to correlate the concepts of Physics with the core programmes	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature.
	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications.

Course Code:CYT 100

Course Name: ENGINEERING CHEMISTRY

Course Objectives	Subject Learning Outcomes or course outcomes
The students to acquire knowledge in the concepts of chemistry for engineering applications and to familiarize the students with different application oriented topics like spectroscopy, electrochemistry, instrumental methods etc.	Apply their knowledge for protection of different metals from corrosion. To prevent the monuments from getting corroded, recent trends in electrochemical energy storage devices.
Also familiarize the students with topics like mechanism of corrosion, corrosion prevention methods, SEM, stereochemistry, polymers, desalination etc., which enable them to develop abilities and skills that are relevant to the study and practice of chemistry.	Learn how to use different spectroscopy techniques for analysis purpose of simple molecules.
	Design economically and new methods of synthesis nano materials.
	Substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution.
	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.

Course Code: EST 100

Course Name: ENGINEERING MECHANICS

Course Objectives	Subject Learning Outcomes or course outcomes
the students to the fundamental concepts of mechanics and enhance their problem-solving skills	Recall principles and theorems related to rigid body mechanics
It introduces students to the influence of applied force system and the geometrical properties of the rigid bodies while stationary or in motion.	Identify and describe the components of system of forces acting on the rigid body
After this course students will be able to recognize similar problems in real-world situations and respond accordingly.	Apply the conditions of equilibrium to various practical problems involving different force system
	Choose appropriate theorems, principles or formulae to solve problems of mechanics
	Solve problems involving rigid bodies, applying the properties of distributed areas and masses

Course Code: EST 110

Course Name: ENGINEERING GRAPHICS

Course Objectives	Subject Learning Outcomes or course outcomes
The student to effectively perform technical communication through graphical representation as per global standards.	Draw the projection of points and lines located in different quadrants
	Prepare multi-view orthographic projections of objects by visualizing them in different positions
	Draw sectional views and develop surfaces of a given object
	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
	Convert 3D views to orthographic views, Obtain multiview projections and solid models of objects using CAD tools

Course Code: EST 120

Course Name: BASICS OF CIVIL & MECHANICAL ENGINEERING

Course Objectives	Subject Learning Outcomes or course outcomes
This course is to provide an insight and inculcate the essentials of Civil Engineering discipline to the students of all branches of Engineering and to provide the students an illustration of the significance of the Civil Engineering Profession in satisfying the societal needs.	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.
	Explain different types of buildings, building components, building materials and building construction
	Describe the importance, objectives and principles of surveying.
	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
	Discuss the Materials, energy systems, water management and environment for green buildings.
	Analyse thermodynamic cycles and calculate its efficiency
	Illustrate the working and features of IC Engines
	Explain the basic principles of Refrigeration and Air Conditioning
	Describe the working of hydraulic machines
	Explain the working of power transmission elements
	Describe the basic manufacturing, metal joining and machining processes

Course Code: EST 110

Course Name: ENGINEERING GRAPHICS

Course Objectives	Subject Learning Outcomes or course outcomes
The student to effectively perform technical communication through graphical representation as per global standards.	Draw the projection of points and lines located in different quadrants
	Prepare multi-view orthographic projections of objects by visualizing them in different positions
	Draw sectional views and develop surfaces of a given object
	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
	Convert 3D views to orthographic views, Obtain multiview projections and solid models of objects using CAD tools

Course Code: EST 110

Course Name: ENGINEERING GRAPHICS

Course Objectives	Subject Learning Outcomes or course outcomes
The student to effectively perform technical communication through graphical representation as per global standards.	Draw the projection of points and lines located in different quadrants
	Prepare multi-view orthographic projections of objects by visualizing them in different positions
	Draw sectional views and develop surfaces of a given object
	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
	Convert 3D views to orthographic views, Obtain multiview projections and solid models of objects using CAD tools

Course Code: EST 130

Course Name: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Objectives	Subject Learning Outcomes or course outcomes
The aims to (1) equip the students with an understanding of the fundamental principles of electrical engineering.	Demonstrate safety measures against electric shocks
2) provide an overview of evolution of electronics, and introduce the working principle and examples of fundamental electronic devices and circuits.	identify the tools used for electrical wiring ,electrical accessories, wires, cables, batteries and standard symbols
(3) provide an overview of evolution of communication systems, and introduce the basic concepts in radio communication.	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings.
	Identify and test various electronic components. Assemble and test electronic circuits on boards
	Draw circuit schematics with EDA tools a team with good interpersonal skills

Course Code: HUN 101

Course Name: LIFE SKILLS

Course Objectives	Subject Learning Outcomes or course outcomes
Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes.	Define and Identify different life skills required in personal and professional life
Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at.	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress..
This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underly personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers	Explain the basic mechanics of effective communication and demonstrate these through presentations.
	Explain the basic mechanics of effective communication and demonstrate these through presentations.
	Understand the basics of teamwork and leadership

Course Code: HUN 102

Course Name: PROFESSIONAL COMMUNICATION

Course Objectives	Subject Learning Outcomes or course outcomes
Clear, precise, and effective communication has become a sine qua non in today's information-driven world given its interdependencies and seamless connectivity.	. Understand the role of communication in personal & professional success
Any aspiring professional cannot but master the key elements of such communication.	. Understand the role of communication in personal & professional success
The objective of this course is to equip students with the necessary skills to listen, read, write, and speak so as to comprehend and successfully convey any idea, technical or otherwise, as well as give them the necessary polish to become persuasive communicators	Prepare and present messages with a specific intent.
	Analyze a variety of communication acts.
	Ethically use, document and integrate sources

Course Code: EST 102

Course Name: PROGRAMING IN C

Course Objectives	Subject Learning Outcomes or course outcomes
C programs to solve computational problems that they may have to solve in their professional life.	Analyze a computational problem and develop an algorithm/flowchart to find its solution
The course content is decided to cover the essential programming fundamentals which can be taught within the given slots in the curriculum.	Write readable C programs with arrays, structure or union for storing the the data to be processed
This course has got 2 Hours per week for practicing programming in C. A list showing 24 mandatory programming problems are given at the end.	Write readable C programs with arrays, structure or union for storing the the data to be processed
The instructor is supposed to give homework/assignments to write the listed programs in the rough record as and when the required theory part is covered in the class. The students are expected to come prepared with the required program written in the rough record for the lab classes.	Write readable C programs which use pointers for array processing and parameter passing
	Develop readable C programs with files for reading input and storing output

Course Code: PHL :120

Course Name: ENGINEERING PHYSICS LAB

Course Objectives	Subject Learning Outcomes or course outcomes
the students gain practical knowledge to co-relate with the theoretical studies and to develop practical applications of engineering materials and use the principle in the right way to implement the modern technology.	Compute the quantitative aspects of waves and oscillations in engineering systems
	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments
.	Apply the concept of polarization to understand the wave nature of light and the method of analyzing the light whether it is polarized or not. Explain types of superconductivity and their applications
	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices
	Compute the quantitative aspects of waves and oscillations in engineering systems

Course Code: CYL 120

Course Name: ENGINEERING CHEMISTRY LAB

Course Objectives	Subject Learning Outcomes or course outcomes
To impart scientific approach and to familiarize with the experiments in chemistry relevant for research projects in higher semesters	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
.	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments. Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum

Course Code: ESL:120

Course Name: CIVIL & MECHANICAL WORKSHOP

Course Objectives	Subject Learning Outcomes or course outcomes
The course is designed to train the students to identify and manage the tools, materials and methods required to execute an engineering project.	Name different devices and tools used for civil engineering measurements
Students will be introduced to a team working environment where they develop the necessary skills for planning, preparing and executing an engineering project.	Explain the use of various tools and devices for various field measurements
To enable the student to familiarize various tools, measuring devices, practices and different methods of manufacturing processes employed in industry for fabricating components	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work.
	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
	Compare different techniques and devices used in civil engineering measurements
	Identify Basic Mechanical workshop operations in accordance with the material and objects
	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
	Apply appropriate safety measures with respect to the mechanical workshop trades

Course Code: ESL 130

Course Name: ELECTRICAL & ELECTRONICS WORKSHOP

Course Objectives	Subject Learning Outcomes or course outcomes
Electrical Workshop is intended to impart skills to plan and carry out simple electrical wiring.	Demonstrate safety measures against electric shocks
It is essential for the practicing engineers to identify the basic practices and safety measures in electrical wiring.	identify the tools used for electrical wiring ,electrical accessories, wires, cables, batteries and standard symbols
	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings.
	Identify and test various electronic components. Assemble and test electronic circuits on boards
	Draw circuit schematics with EDA tools a team with good interpersonal skills



MAHAGURU INSTITUTE OF TECHNOLOGY

Approved by AICTE and Affiliated to APJ Abdul Kalam Technological University

Accredited by NAAC with B+ Grade

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023

COURSE OUTCOME

ACADEMIC YEAR 2022-2023

SEMESTER 3 AND SEMESTER 4 (2021-2025 Batch)

-

SEMESTER 3

MAT201: Partial Differential Equation And Complex Analysis

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Understand the concept and the solution of partial differential equation.	To equip the students with methods of solving a general system of linear equations.
2	Analyse and solve one dimensional wave equation and heat equation	To familiarize them with the concept of Eigen values and diagonalization of a matrix which have many applications in Engineering
3	Understand complex functions, its continuity differentiability with the use of CauchyRiemann equations.	To understand the basic theory of functions of a complex variable and conformal Transformations.
4	Evaluate complex integrals usingCauchy's integral theorem and Cauchy's integral formula, understand the series expansion of analytic function	
5	Understand the series expansion of complex function about a singularity and Apply residue theorem to compute several kinds of real integrals.	

CET201:MECHANICS OF SOLIDS

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course Objective
	On completion of course the students will be able to:	
1	Recall the fundamental terms and theorems associated with mechanics of linear elastic deformable bodies.	To enable the students to calculate stresses and strains generated in material due to external loads for various types of loading conditions
2	Explain the behavior and response of various structural elements under various loading conditions.	
3	Apply the principles of solid mechanics to calculate internal stresses/strains, stress resultants and strain energies in structural elements subjected to axial/transverse loads and bending/twisting moments.	
4	Choose appropriate principles or formula to find the elastic constants of materials making use of the information available.	
5	Perform stress transformations, identify principal planes stresses and maximum shear stress at a point in a structural member	
6	Analyse the given structural member to calculate the safe load or proportion the cross section to carry the load safely.	

CET 203: FLUID MECHANICS AND MACHINERY

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Recall the relevant principles of hydrostatics and hydraulics of pipes and open channels	Goal of this course is to expose the students to the fundamental concepts of fluid mechanics, hydraulics of pipes and open channels and to enhance the problem solving skills..
2	Identify or describe the type, characteristics or properties of fluid flow	The concepts learned will help in applying them for the design of hydraulic structures and to real world fluid flow problems
3	Estimate the fluid pressure, perform the stability check of bodies under hydrostatic condition	
4	Compute discharge through pipes or estimate the forces on pipe bends by applying hydraulic principles of continuity, energy and/or momentum	
5	Analyze or compute the flow through open channels, perform the design of prismatic channels	

CET205:SURVEYING & GEOMATICS

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Apply surveying techniques and principles of leveling for the preparation of contour maps, computation of area-volume and sketching mass diagram	Objective of the course is to impart an awareness on the principles of surveying, various methods and instruments of surveying, errors associated with field measurements and advanced surveying techniques.
2	Apply the principles of surveying for triangulation	
3	Apply different methods of traverse surveying and traverse balancing	
4	Identify the possible errors in surveying and apply the corrections in field measurements	
5	Apply the basic knowledge of setting out of different types of curves	
6	Employ surveying techniques using advanced surveying equipments	

MCN201:SUSTAINABLE ENGINEERING

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Understand the relevance and the concept of sustainability and the global initiatives in this direction	Objective of this course is to inculcate in students an awareness of environmental issues and the global initiatives towards attaining sustainability. The student should realize the potential of technology in bringing in sustainable practices.
2	Explain the different types of environmental pollution problems and their sustainable solutions	
3	Discuss the environmental regulations and standards	
4	Outline the concepts related to conventional and non-conventional energy	
5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles	

HUT200:PROFESSIONAL ETHICS

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Understand the core values that shape the ethical behaviour of a professional.	To enable students to create awareness on ethics and human values.
2	Adopt a good character and follow an ethical life.	
3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.	
4	Solve moral and ethical problems through exploration and assessment by established experiments.	
5	Apply the knowledge of human values and social values to contemporary ethical values and global issues	

CEL201:CIVIL ENGINEERING PLANNING &DRAFTING LAB

Sl.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Illustrate ability to organise civil engineering drawings systematically and professionally	The course is designed to introduce the fundamentals of Civil Engineering drawing and understand the principles of planning.
2	Prepare building drawings as per the specified guidelines.	The students will be able to learn the drafting of buildings manually and using drafting software such as AutoCAD.
3	Assess a complete building drawing to include all necessary information	
4	Create a digital form of the building plan using any drafting software	

CEL203:SURVEY LAB

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Use conventional surveying tools such as chain/tape and compass for plotting and area determination.	To impart practical experience to students by exposing them to various techniques of field surveying. The course is designed to make student familiar with conventional and advanced surveying instruments.
2	Apply levelling principles in field	
3	Solve triangulation problems using theodolite	
4	Employ total station for field surveying	
5	Demonstrate the use of distomat and handheld GPS	

SEMESTER 4

MAT 204 PROBABILITY, RANDOM PROCESSES AND NUMERICAL METHODS

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Understand the concept, properties and important models of discrete random variables and, using them, analyse suitable random phenomena.	This course introduces students to the modern theory of probability and statistics,
2	Understand the concept, properties and important models of continuous random variables and, using them, analyse suitable random phenomena.	A brief course in numerical methods familiarises students with some basic numerical techniques for finding roots of equations,
3	Analyse random processes using autocorrelation, power spectrum and Poisson process model as appropriate.	
4	Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques	
5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.	

CET202:ENGINEERING GEOLOGY

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Recall the fundamental concepts of surface processes, subsurface process, minerals, rocks, groundwater and geological factors in civil engineering constructions.	Goal of this course is to introduce to the students the basics of earth processes, materials, groundwater and the geological characteristics of such processes and materials which are relevant to the Civil Engineering applications.
2	Identify and describe the surface processes, subsurface process, earth materials, groundwater and geological factors in civil engineering constructions.	
3	Apply the basic concepts of surface and subsurface processes, minerals, rocks, groundwater and geological characteristics in civil engineering constructions	
4	Analyse and classify geological processes, earth materials and groundwater	
5	Evaluation of geological factors in civil engineering constructions	

CET204:GEOTECHNICAL ENGINEERING - I

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Explain the fundamental concepts of basic and engineering properties of soil	To expose the students to the fundamental concepts of soil mechanics and laboratory tests to determine the basic, index and engineering properties of soils.
2	Describe the laboratory testing methods for determining soil parameters	students will be able to identify and classify the soil and to recognize practical problems in real-world situations and respond accordingly.
3	Solve the basic properties of soil by applying functional relationships	
4	Calculate the engineering properties of soil by applying the laboratory test results and the fundamental concepts of soil mechanics	
5	Analyse the soil properties to identify and classify the soil	

CET 206:TRANSPORTATION ENGINEERING

Sl.	Subject Learning Outcomes or Course Outcomes	
No.	On completion of course the students will be able to:	
1	Apply the basic principles of Highway planning and design highway geometric elements	To introduce the principles and practice of Highway, Railway, Harbour And dock Tunnel and Airport Engineering.
2	Apply standard code specifications in judging the quality of highway materials; designing of flexible pavements	
3	Explain phenomena in road traffic by collection, analysis and interpretation of traffic data through surveys; creative design of traffic control facilities	
4	Understand about railway systems, tunnel, harbour and docks	
5	Express basics of airport engineering and design airport elements	

EST 200 DESIGN AND ENGINEERING

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Explain the different concepts and principles involved in design engineering.	The course will help students to consider aesthetics, ergonomics and sustainability factors in designs and also to practice professional ethics while designing.
2	Apply design thinking while learning and practicing engineering.	
3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.	

MCN202CONSTITUTION OF INDIA

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Explain the background of the present constitution of India and features.	The study of their own country constitution and studying the importance environment as well as understanding their own human rights help the students to concentrate on their day to day discipline.
2	Utilize the fundamental rights and duties.	It also gives the knowledge and strength to face the society and people.
3	Understand the working of the union executive, parliament and judiciary.	
4	Understand the working of the state executive, legislature and judiciary.	
5	Utilize the special provisions and statutory institutions.	
6	Show national and patriotic spirit as responsible citizens of the country.	

CEL 202:MATERIAL TESTING LAB - I

Sl. No.	<p align="right">Subj</p> <p>ect Learning Outcomes or Course Outcomes</p> <p>On completion of course the students will be able to:</p>	<p align="center">Course objective</p>
1	<p>The understand the behaviour of engineering materials under various forms and stages of loading.</p>	<p>The course aims to enrich the students to gain hands-on experience in conducting laboratory tests on various construction materials and thereby evaluate material quality and performance.</p>
2	<p>Characterize the elastic properties of various materials.</p>	
3	<p>Evaluate the strength and stiffness properties of engineering materials under various loading conditions</p>	

CEL 204:FLUID MECHANICS LAB

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Apply fundamental knowledge of Fluid Mechanics to corresponding experiments	The course is designed to train the students to familiarize and understand the different flow measurement equipment's and their procedures.
2	Apply theoretical concepts in Fluid Mechanics to respective experiments	
3	Analyse experimental data and interpret the results	
4	Document the experimentation in prescribed manner	

ACADEMIC YEAR 2022-2023

SEMESTER 5 AND SEMESTER 6
(2020-2024 Batch)

SEMESTER 5

CET301 STRUCTURAL ANALYSIS 1

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Apply the principles of solid mechanics to analyse trusses. Applying	The course enables the students to analyse various types of simple structures using appropriate methods and tools.
2	Apply energy principles to analyse statically determinate structures.	Introduces the applications of principles of mechanics of solids to determine stress resultants in statically determinate and indeterminate structures.
3	Identify the problems with static indeterminacy and understand the basic concepts of tackling such problems by means of the method of consistent deformation	students will be able to analyse structures subjected to moving loads as well.
4	Apply suitable methods of analysis for various types of structures including cables, suspension bridges and arches.	
5	Analyse the effects of moving loads on structures using influence lines.	
6	Apply specific methods such as slope deflection and moment distribution methods of structural analysis for typical structures with different characteristics.	

CET303:DESIGN OF CONCRETE STRUCTURES

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Recall the fundamental concepts of limit state design and code provisions for design of concrete members under bending, shear, compression and torsion.	The course provides all the fundamental topics in reinforced concrete design and enable students to design and detail reinforced concrete structural members such as beam, slab, column and footing
2	Analyse reinforced concrete sections to determine the ultimate capacity in bending, shear and compression.	It provides an introduction to earthquake resistance
3	Design and detail beams, slab, stairs and footings using IS code provisions	
4	Design and detail columns using IS code and SP 16 design charts	
5	Explain the criteria for earthquake resistant design of structures and ductile detailing of concrete structures subjected to seismic forces	

CET 303: GEOTECHNICAL ENGINEERING II

SL No	Subject Learning Outcomes or Course Outcomes	Course objectives
1.	Identify a suitable foundation system for a structure.	To utilize the knowledge of earth pressure theories and soil properties for the design of foundation.
2.	Explain the basic concepts, theories and methods of analysis in foundation engineering.	To build necessary theoretical background for the design and construction of foundation systems.
3.	Calculate bearing capacity, pile capacity, foundation settlement and earth pressure.	To gain an understanding of the design process in foundation engineering.
4.	Analyze shallow and deep foundations	To learn about the types and purposes of different types of foundation.
5.	Understand soil exploration methods	To understand the importance of site investigation and field testing and how to deal with uncertainty.
6.	Solve the field problems related to geotechnical engineering	To learn about the various soil exploration methods.

CET307:HYDROLOGY & WATER RESOURCES ENGINEERING

Sl. No.	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:	Course objectives
1	Describe and estimate the different components of hydrologic cycle by processing hydrometeorological data	Objective of this course is to expose the students to the fundamental concepts of surface and groundwater components of hydrology and basics of water resources engineering.
2	Determine the crop water requirements for the design of irrigation canals by recollecting the principles of irrigation engineering	To impart the knowledge on the availability of water on hydrosphere, its distribution and quantification, scientific methods for computing irrigation water requirements, reservoir engineering and river engineering
3	Perform the estimation of streamflow and/or describe the river behaviour and control structures	
4	Describe and apply the principles of reservoir engineering to estimate the capacity of reservoirs and their useful life	
5	Demonstrate the principles of groundwater engineering and apply them for computing the yield of aquifers and wells	

CET309:CONSTRUCTION TECHNOLOGY& MANAGEMENT

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Describe the properties of materials used in construction Understand	The course provides a detailed insight into the materials used in construction, various building elements and construction technology.
2	Explain the properties of concrete and its determination Understand	students will be familiar with the fundamental concepts of building construction and management.
3	Describe the various elements of building construction Understand	
4	Explain the technologies for construction Understand	
5	Describe the procedure for planning and executing public works Understand	
6	Apply scheduling techniques in project planning and control	

MCN301: DISASTERMANAGEMENT

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle.	The objective of this course is to introduce the fundamental concepts of hazards and disaster management.
2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment.	
3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk.	
4	Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community.	
5	Identify factors that determine the nature of disaster response and discuss the various disaster response actions.	
6	Explain the various legislations and best practices for disaster management and risk reduction at national and international level.	

CEL331 MATERIAL TESTINGN LAB II

Subject Learning Outcomes or Course Outcomes	Course objectives
On completion of course the students will be able to:	
To describe the basic properties of various construction materials	The course aims to enrich the students to gain hands-on experience in conducting laboratory tests on various construction materials and thereby evaluate material quality and performance.
Characterize the physical and mechanical properties of various construction materials	
Interpret the quality of various construction materials as per IS Codal provisions	

CEL333 GEOTECHNICAL ENGINEERING LAB

Subject Learning Outcomes or Course Outcomes	COURSE OBJECTIVES
On completion of course the students will be able to:	
Identify and classify soil based on standard geotechnical experimental methods.	Objective of the course is to familiarize students with the laboratory tests used to determine physical, index and engineering properties of geomaterials.
Perform and analyse permeability tests	
Interpret engineering behaviour of soils based on test results	
Perform laboratory compaction, CBR and in-place density test for fill quality control in the field.	
Evaluate the strength of soil by performing various tests viz. direct shear test, unconfined compressive strength test and triaxial shear test	
Evaluate settlement characteristics of soils.	

SEMESTER 6

CET302:STRUCTURAL ANALYSIS – II

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Understand the principles of plastic theory and its applications in structural analysis.	To enable the students to have a comprehensive idea of matrix structural analysis with emphasis on the relative advantages of the flexibility method and the stiffness method
2	Examine the type of structure and decide on the method of analysis.	To enable the students to visualize structural dynamics problems with a proper blend of structural analysis and vibration theory
3	Apply approximate methods of analysis for framed structures to ascertain stress resultants approximately but quickly.	
4	Apply the force method to analyse framed structures.	
5	Apply the displacement methods to analyse framed structures.	
6	Remember basic dynamics, understand the basic principles of structural dynamics and apply the same to simple structures.	

CET304:ENVIRONMENTAL ENGINEERING

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	To appreciate the role of environmental engineering in improving the quality of environment	To study the significance of water resources and the factors affecting the quality and quantity of water
2	To plan for collection and conveyance of water and wastewater	To study various type of treatment techniques
3	To enhance natural water purification processes in anengineered environment	
4	To decide on appropriate technology for water and wastewater treatment	

CET306:DESIGN OF HYDRAULIC STRUCTURES

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objective
	On completion of course the students will be able to:	
1	Elucidate the causes of failure, principles of design of different components of hydraulic structures	The general objective of this course is to expose the students to the fundamental concepts of hydraulic design of different hydraulic structures and to develop the drawings of minor irrigation structures.
2	Describe the features of canal structures and perform the design of alluvial canals	This course equip the students to perform the hydraulic design of minor irrigation structures such as cross drainage works, canal falls and regulators and prepare drawings of the same
3	Perform the hydraulic design of minor irrigation structures such as cross drainage works, canal falls, cross regulator	To impart the knowledge on causes of failure and design criteria of hydraulic structures like dams and canal structures
4	Prepare the scaled drawings of different minor irrigation structures	
5	Describe the design principles and features of dams and perform the stability analysis of gravity dams	

CET362:ENVIRONMENTAL IMPACT ASSESSMENT

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course Objectives
	On completion of course the students will be able to:	
1	To appreciate the need for minimizing the environmental impacts of developmental activities Understanding	This course introduces the methodologies for identifying, predicting, evaluating and mitigating the impacts on environment due to any developmental project or activities.
2	To understand environmental legislation & clearance procedure in the country	Students will learn how to prepare an impact assessment report and devise an environment management plan
3	To apply various methodologies for assessing the environmental impacts of any developmental activity	Sufficient background will be provided on the environmental clearance procedures in India
4	To prepare an environmental impact assessment report	
5	To conduct an environmental audit	

CET308:COMPREHENSIVE COURSE WORK

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Learn to prepare for a competitive examination	The course is designed to ensure that the student have firmly grasped the foundationalknowledge in Civil Engineering familiar enough with the technological concepts.
2	Comprehend the questions in Civil Engineering field and answer them with confidence	It provides an opportunity for the students to demonstrate their knowledge in various Civil Engineering subjects
3	Communicate effectively with faculty in scholarly environments	
4	Analyse the comprehensive knowledge gained in basic courses in the field of CivilEngineering	

HUT300 INDUSTRIAL ECONOMICS & FOREIGN TRADE

Sl. No.	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:	Course objectives
1	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare.	To equip the students to take industrial decisions and to create awareness of economic environment.
2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production.	
3	Determine the functional requirement of a firm under various competitive conditions.	
4	Examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society.	
5	Determine the impact of changes in global economic policies on the business opportunities of a firm.	

CEL332:TRANSPORTATION ENGINEERING LAB

Sl. No.	Subject Learning Outcomes or Course Outcomes
	On completion of course the students will be able to:
1	Analyse the suitability of soil as a pavement subgrade material
2	Assess the suitability of aggregates as a pavement construction material
3	Characterize bitumen based on its properties so as to recommend it as a pavement construction material.
4	Design bituminous mixes for pavement layers
5	Assess functional adequacy of pavements based on roughness of pavementsurface.

CEL334:CIVIL ENGINEERING SOFTWARE LAB

Sl. No.	Subject Learning Outcomes or Course Outcomes
	On completion of course the students will be able to:
1	To undertake analysis and design of multi-storeyed framed structure, schedule a given set of project activities using a software.
2	To prepare design details of different structural components, implementation plan for a project
3	To prepare a technical document on engineering activities like surveying , structural design and project planning.

ACADEMIC YEAR 2022-2023
SEMESTER 7 AND SEMESTER8
(2019-2023 Batch)

SEMESTER 7

CET401 DESIGN OF STEEL STRUCTURES

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Learn the behaviour of structural steel components Ability to perform analysis and design of steel members and connections.	Identify and compute the design loads on a typical steel building.
2	Ability to design steel structural systems	Identify the different failure modes of steel tension and compression members and beams, and compute their design strengths.
3	learn the behaviour of structural steel components	Select the most suitable section shape and size for tension and compression members and beams according to specific design criteria.
4	Familiarity with professional and contemporary issues	Identify the different failure modes of bolted and welded connections, and determine their design strengths.
5		Ability to analyze and design of tension members, columns, beams and simple bolted and welded connections
6		Apply relevant Indian Standard provisions to ensure safety and serviceability of structural steel elements.

CET423 GROUND IMPROVEMENT TECHNIQUES

Sl. No.	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:	Course objectives
2	Classify different ground improvement methods based on the soil suitability	The course introduces the various types ground improvement techniques that can be adopted in different site conditions.
3	Outline the basic concept/ design aspects of various ground improvement methods	It enables the students to choose the suitable ground improvement techniques to be adopted depends on the site condition and requirements.
4	Identify the construction procedure of different ground improvement methods	
5	Choose different application of geosynthetics and soil stabilisation	

CEL 411 ENVIRONMENTAL ENGINEERING LAB

SL No	Course Objectives	Subject Learning Outcomes or Course Outcomes
1.	To identify the importance of water and waste water characteristic studies.	Ability to determine the different parameters of water and waste water.
2.	To learn the legislative standards for various water and waste water parameters.	To conduct the water and waste water characteristic study.
3.	Learn to determine the physical, chemical and biological parameters of water.	To choose the technologies required for domestic and industrial waste water treatment.
4.	Learn to analyze the suitability of water for drinking, irrigation and concreting purposes.	Identify the appropriate testing methods for the given water sample
5.	To understand the procedure for preparation of stock and standard solutions as well as their handling and storage.	Propose appropriate solution to environmental problems
6.	To explore new technologies for integrated practice.	To compare the laboratory results with the legislative standards and interpret the results

MET445 RENEWABLE ENERGY ENGINEERING

Sl. No.	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:	Course objectives
1	Explain renewable energy sources and evaluate the implication of renewable energy. To predict solar radiation at a location	The course is intended to give knowledge of various renewable energy sources, systems and applications and the need in the present context. Students will be able to compare different renewable energy techniques and choose the most appropriate based on local conditions..
2	Explain solar energy collectors, storages, solar cell characteristics and applications	To equip students in working with projects and to take up research work in connected areas.
3	Explain the different types of wind power machines and control strategies of wind turbines	
4	Explain the ocean energy and conversion devices and different Geothermal sources	
5	Explain biomass energy conversion devices. Calculate the Net Present value and payback period	

CEQ413 SEMINAR

Sl. No.	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:	Course objectives
1	Identify academic documents from the literature which are related to her/his areas of interest (Cognitive knowledge level: Apply)	To do literature survey in a selected area of study.
2	Read and apprehend an academic document from the literature which is related to her/his areas of interest (Cognitive knowledge level: Analyze)	To understand an academic document from the literature and to give a presentation about it.
3	Prepare a presentation about an academic document (Cognitive knowledge level: Create).	To prepare a technical report...
4	Give a presentation about an academic document (Cognitive knowledge level: Apply).	
5	Prepare a technical report (Cognitive knowledge level: Create).	

CED415 PROJECT PHASE I

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).	To apply engineering knowledge in practical problem solving.
2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).	To foster innovation in design of products, processes or systems. ⇐
3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).	To develop creative thinking in finding viable solutions to engineering problems....
4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).	
5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).	
	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).	

SEMESTER 8

CET402 QUANTITY SURVEYING AND VALUATION

Sl. No.	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:	Course objectives
1	Define basic terms related to estimation, quantity surveying and contract document	The course provides the knowledge about various types of estimation and specification of different civil engineering works.
2	Interpret the item of work from drawings and explain its general specification and unit of measurement.	It equips students to analyze the rate of various items of work with reference to the standard data and schedule of rate
3	Make use of given data from CPWD DAR/DSR for calculating the unit rate of different items of work associated with building construction	
4	Develop detailed measurement (including BBS) and BoQ of a various work like buildings, earthwork for road, sanitary and water supply work	
5	Explain various basic terms related to valuation of land and building	

CET454 CONSTRUCTION METHODS & EQUIPMENT

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Explain the various construction procedures for sub structures and super structures	This course introduces students to construction equipment and selected construction methods.
2	Describe the various construction activities involved in underground and under water construction.	
3	Demonstrate basic knowledge about construction equipment and machineries	
4	Explain the equipment used for production of aggregates and concreting	
5	Select construction equipment appropriate to tasks	

CET476 BUILDING SERVICES

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Recommend appropriate water management services	The course aims to provide a basic understanding about the various building services and enable the students to apply them in building planning and construction.
2	Develop a system for the management of waste.	
3	Identify suitable electrical and mechanical building services	
4	4Recall the various firefighting services	
5	Choose relevant materials and practices for good acoustics	
6	Propose sustainable construction materials, methods, and practices	

CET468 CLIMATE CHANGE & SUSTAINABILITY

Sl. No.	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:	Course objectives
1	Explain the fundamental concepts of climate and its influencing factors	Goal of this course is to expose the students to the fundamental concepts of climate, its influencing factors, climate change and its relationship with sustainability.
2	Explain the factors affecting climate change and the harmful impacts due to climate change.	After this course, students will be able to recognize the real-world problems that can happen due to climate change, aware of the various mitigation and adaptation techniques using sustainable technologies for combating the adverse impacts due to climate change and respond accordingly
3	Discuss the problems due to urbanization and the need for sustainable development	
4	Demonstrate the various adaptation and mitigation techniques for combating climate change	
5	Discuss multilateral agreements on climate change, Case studies on Climate change	

CED416 PROJECT PHASE II

Sl. No.	Subject Learning Outcomes or Course Outcomes	Course objectives
	On completion of course the students will be able to:	
1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).	To apply engineering knowledge in practical problem solving.
2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).	To foster innovation in design of products, processes or systems. ⇐
3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).	To develop creative thinking in finding viable solutions to engineering problems....
4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).	
5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).	
	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).	