APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B. TECH CIVIL ENGINEERING

Course Outcomes

PH 100: ENGINEERING PHYSICS

CO1: Differentiate different types of oscillations and apply knowledge in engineering systems

CO2: Differentiate interference, diffraction and polarization and apply knowledge in daily life situations.

CO3: Distinguish between different types of superconductors.

CO4: Explain the principles of physics using theories of quantum mechanics statistical mechanics and optics.

CO5: Apply the knowledge of acoustics in the construction of buildings.

CO6: Explain the construction and working of different laser systems and their applications.

MA101: CALCULUS

CO1: Check convergence of infinite series.

CO2: acquire a basic knowledge of phenomena involving continuous change of variable.

CO3: understand differential calculus of functions of one or more variables and of vector functions.

CO4: find areas and volumes using integrals.

CO5: analyses the application of vector valued functions in physical applications.

CO6: understand integral calculus of functions of one or more variables and of vector functions

MA 102: DIFFERENTIAL EQUATIONS

CO 1: Identify and solve homogeneous differential equations.

CO 2: Solve non-homogeneous differential equations.

CO 3: Evaluation of Fourier series.

CO 4: Identify and solve problems in partial differential equations.

CO 5: Apply one dimensional wave equation to solve problems in different domain.

CO 6: Apply one dimensional heat equation to solve problems in different domain.

BE 103: INTRODUCTION TO SUSTAINABLE ENGINEERING

CO1: The student will be able to understand the different types of environmental pollution problems and their sustainable solutions.

CO2: The student will be able to acquire attitudes of care and concern for ecologically sustainable development.

CO3: The student will be able to recognize the implications of the ways to feed and provide one self.

CO4: The student will be able to develop skills to investigate and solve issues in the environment.

CO5: The student will be able to work in the area of sustainability for research and education.

CO6: The student will be having a broader perspective in contributing for sustainable practices by utilizing the engineering knowledge and principles gained from this course.

BE110: ENGINEERING GRAPHICS

CO1: Able to prepare the orthographic projections of points and straight lines placed in various quadrants.

CO2: Demonstrate the ability to draw orthographic projections of various solids.

CO3: Ability to draw and interpret the sectioned views of solids.

CO4: Ability to draw the developments of various solids.

CO5: Will be confident in preparing the isometric and perspective views of various solids.

CO6: Ability to draw the projections of intersection of solids and perform free hand sketching

CY 100: ENGINEERING CHEMISTRY

CO1: Students will be able to elucidate the structures of organic molecules from spectral data.

CO2: Students will be able to understand the fundamental and applied concepts of Electrochemistry.

CO3: Students develop understanding of the theories of instrumental methods in analytical chemistry.

CO4: Students will be able to understand the properties and applications of engineering materials.

CO5: Students will be able to compute the property of fuels and lubricating oils.

CO6: Students will be able to make technology choice to deal with water quality issues.

CO7: The student will be equipped to take up chemistry related topics as a part of their project works during higher semester of the course.

PH110: ENGINEERING PHYSICS LAB

CO1: Gain knowledge about different types of oscillations and resonant electrical circuits.

CO2: Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations.

CO3: Apply and demonstrate the theoretical concepts of Engineering Physics and develop scientific attitude.

CO4: Design new experiments / instruments with practical knowledge.

CO5: Develop skills to impart practical knowledge in real time solutions.

CO6: Apply theoretical concepts of LASER and Grating.

EE 110: ELECTRICAL ENGINEERING WORKSHOP

CO1: Understand the different supply arrangements and their limitations, standard voltages and their tolerances.

CO2: Familiarize with safety aspects of electrical systems and importance of protective measures in wiring systems.

CO3: Select the suitable wires, cables and other accessories used in wiring.

CO4: Work in the area of creating awareness of energy conservation in electrical systems.

CO5: Wire up simple lighting circuits for domestic buildings, distinguish between light and power circuits.

CO6: Measure electrical circuit parameters and current, voltage and power in a circuit.

CE 100: BASIC CIVIL ENGINEERING

CO1: Discuss the fundamental aspects of civil engineering.

CO2: Discuss the fundamentals for planning and setting out a building.

C03: Understand the concepts of surveying for making horizontal & vertical measurements.

CO4: Discuss the uses of various building materials.

CO5: Explain the method of construction of different components of a building.

CO6: Discuss about various services in a building.

CE 110: CIVIL ENGINEERING WORKSHOP

CO1: Student should be able to set out a building using tape and cross staff

CO2: Student should be able to determine area and mass moment of inertia

CO3: Student should be able to construct one and a half and two brick walls using English bond

CO4: Student should be able to calculate the area and volume of various features of a building

CO5: Student should be able to determine and vertical distance between points

CO6: Student should be able to determine areas of irregular shapes.

EC100: BASICS OF ELECTRONICS ENGINEERING

CO1: Understand the types, specification and standard values and applications of various passive and active components.

CO2: Get an idea about the working and applications of different types of semiconductors, diodes and transistors.

CO3: Understand the working of rectifiers, amplifiers and oscillators.

CO4: Get a basic idea of analog and digital integrated circuits and various measuring instruments.

CO5: Understand the concepts of radio communication and satellite communication.

CO6: Get a fundamental idea about mobile and optical communication and entertainment electronics.

EC110: ELECTRONICS ENGINEERING WORKSHOP

CO1: Identify different electronic components like resistors, capacitors, inductors, transformers diodes, transistors etc.

CO2: Familiarize testing and measuring instruments like the multimeter, function generator, power supply & CRO.

CO3: Assemble and connect different circuits on a breadboard.

CO4: Acquire soldering and desoldering skills, useful in electronic circuit interconnections.

CO5: Familiarize EDA tool and public addressing electronic systems

CO6: Assemble electronic circuits/systems on general purpose PCB.

BE 102: DESIGN & ENGINEERING

CO1: Appreciate the different elements involved in good designs and to apply them in practice.

CO2: Aware of the product oriented and user oriented aspects that make the design a success.

CO3: Think of innovative designs incorporating different segments of knowledge gained in the course.

CO4: A boarder perspective of design covering function, cost, environmental sensitivity, safety and other factors other than engineering analysis.

CO5: Gain an ability to design a system, component or process to meet desired needs within realistic constraints.

CO6: Capable to apply knowledge of mathematics, science and engineering.

EE 100: BASICS OF ELECTRICAL ENGINEERING

CO1: Define the fundamental laws of electrical and magnetic circuit

CO2: Design a circuit to suit the need and apply nodal and mesh analysis

CO3: Analyze simple Ac circuits with sources and passive elements

CO4: Explain the generation, transmission and distribution of electrical energy and about different renewable energy sources

CO5: Analyze the performance of different type of Dc motors

CO6: Describe the principle of operation of different type of AC motors

BE 100: ENGINEERING MECHANICS

CO1: Identify all the forces associated with a static frame work and to draw free body diagrams.

CO2: Compute the reactions necessary to ensure static equilibrium

CO3: Compute Centre of Gravity and Moment of Inertia.

CO4: Solve mechanics problems associated with friction forces.

CO5: Describe the motion of a particle in terms of its position, velocity and acceleration in different frames of reference and to define the forces causing the motion of a particle.

CO6: Explain the concept of mechanical vibrations.

ME 100: BASICS OF MECHANICAL ENGINEERING

CO1: Describe fundamentals of Thermodynamics and air standard cycle.

CO2: Explain the working of various energy conservation devices.

CO3: Distinguish different refrigeration and air conditioning system.

CO4: Identify various parts of an automobile.

CO5: Select the appropriate manufacturing process.

CO6: Describe elements and functions of various machine tools.

CY110: ENGINEERING CHEMISTRY LAB

CO1: Use instrumental techniques for chemical analysis.

CO2: Identify the structure of different organic compounds using IR and NMR spectroscopy.

CO3: Acquire the skill for the preparation of engineering materials like polymers.

CO4: Develop understanding about the properties of different fuels and lubricating oils.

CO5: Analyse the quality of water by determining its chemical parameters.

CO6: Acquire knowledge about different types of quantitative estimation.

MA 201: LINEAR ALGEBRA & COMPLEX ANALYSIS

CO1: solve any given system of linear equations.

CO2: find the eigen values of a matrix and how to diagonalise a matrix.

CO3: identify analytic functions and harmonic functions.

CO4: evaluate real definite integrals as application of residue theorem.

CO5: identify conformal mappings

CO6: Find regions that are mapped under certain transformation.

HS 200: BUSINESS ECONOMICS

CO1: Understand elementary principles of Economics and Business Economics.

CO2: Analyze the various market situations with good grasp on the effect of trade cycle.

CO3: Analyze the basic macro-economic concepts and monetary theory.

CO4: Understand macro- economic concepts to improve their ability to analyses the business climate.

CO5: Analyze their employability by combining their technical knowledge with appropriate economic models.

CO6: Attain knowledge of elementary accounting concepts used for preparing balance sheet and interpretation of balance sheets.

CE 201 MECHANICS OF SOLIDS

CO1: Understand the concept of stresses, strain and elastic constants

CO2: Interpret and calculate deformations in statically determinate and indeterminate structure

CO3: Compute the bending moment and shear force for various types of loading conditions

CO4: Demonstrate knowledge of simple bending to analyze the stress variations in composite materials

CO5: Analysis of stress and strain on oblique sections, cylinders and torsion of circular shaft

CO6: Calculate the deflection of statically determinate beams and to recognize the concepts of column buckling

CE203 FLUID MECHANICS 1

CO1: Applying to get a basic knowledge of fluid in static, kinematic and dynamic equilibrium, ability of a body in a fluid based on relative positions of its center of buoyancy and metacenter.

CO2: Applying the kinematics of fluid flow, types of flow, velocity, acceleration of fluid particle and deformation of fluid elements.

CO3: Applying the Dynamic of fluid flow, Bernoulli's equation to fluid flow problems, their applications and momentum principle force

CO4: Understand the flow through different types of orifices, experimental determination of these coefficients and flow through different types of weirs

CO5: Describing the flow through pipes and analyses the major and minor energy losses.

CO6: Understand the concept of development of boundary layer theory, Drag and Lift on Immersed bodies

CE 205 ENGINEERING GEOLOGY

CO1: Discuss the relevance of engineering geology in civil engineering and to classify the different weathering processes

CO2: Interpret the concepts of subsurface and ground water and its engineering significance

CO3: Describe earthquakes in relation to internal structure of the earth and differentiate minerals and its properties

CO4: Identify common rock formatting minerals and common rocks based on their physical properties

CO5: Identify the attitude of geology structures and instruments used

CO6: Examine various natural hazards and its mitigation methods

CE 207 SURVEYING

CO1: Summarize the principle of surveying and various fields of surveying

CO2: Understand types of instruments used in surveying

CO3: Solve area and volume of regular and irregular shaped plots

CO4: Understand the method of triangulation survey

CO5: Calculate various errors occurred during surveying

CO6: Describe a plot using EDMs

CE 231 CVIL ENGINEERING DRAFTING LAB

CO1: Understand the fundamentals of Civil Engineering drawing

CO2: Understand the principles of planning

CO3: Understand drafting of buildings

CO4: Prepare site plan of a given building using Kerala Building Rules

CO5: Understand drafting software - AutoCAD

CO6: Prepare building drawings using CAD software

CE 233 SURVEYING LAB

CO1: The student shall be able to understand the concept of open traverse surveying and apply the same on the fields

CO2: The student shall be able to understand the concept of Levelling and apply it to find elevations of different points in the field by Height of instrument and Rise and Fall Method.

CO3: The student shall be able to determine the angles by Method of Reiteration using Theodolite

CO4: The student shall be able to determine the angles by Method of Repetition using Theodolite

CO5: The student shall be able to understand the meaning of slope distance, horizontal distance and vertical height and its measurement using a Total Station Instrument

CO6: The student shall be able to use resection or method of coordinate for the measurement of area using a Total Station Instrument

MA 202 PROB. DIS, TRANSFORMS & NUM. METHODS

CO1: Acquire the concept of random variable, discrete probability distributions with practical applications in various engineering and social life situation.

CO2: Acquire the concept of continuous probability distributions with practical applications in various engineering and social life situation.

CO3: Understand Fourier transforms which has wide applications in all engineering courses.

CO4: Understand Laplace transforms which has wide applications in all engineering courses.

CO5: Solve various engineering problems using interpolation and iteration.

CO6: Solve various engineering problems using numeric integration

CE202 STRUCTURAL ANALYSIS I

CO1: Analyse and study the displacement response of statically determinate structural truss systems using energy methods.

CO2: Apply unit load method and strain energy method for determination of deflection of statically determinate beams, frames & pin jointed trusses.

CO3: Analyse statically indeterminate structures using strain energy method and method of consistent deformation

CO4: Predict the influence of moving loads and influence lines

CO5: Analyse the statically determinate and indeterminate suspension bridges.

CO6: Analyse the statically determinate and indeterminate arches.

CE204 CONSTRUCTION TECHNOLOGY

CO 1 Understand construction materials, their components and manufacturing process

CO 2 Understand the properties of concrete and different mix design methods

CO 3 Understand the details regarding the construction of building components

CO 4 Analyse and apply learning of materials, structure, servicing and construction of masonry domestic buildings.

CO 5 Define and describe the concepts and design criteria of tall framed and load bearing buildings

CO 6 Understand the details regarding different types of building failures

CE206 FLUID MECHANICS II

CO 1: Applying the fundamental theories of fluid mechanics for the analysis and design of hydraulic machines.

CO2: Understand the working of Pumps and get an insight into the working of hydraulic machine

CO3: Understand the open channel flows & designing open channels.

CO4: Understand the basic principles and laws governing fluid flow to open channel flow including hydraulic jump and gradually varied flow.

CO5: Describing the Gradually varied flow and design of lined open channel

CO6: Understand the concept of Dimensional analysis and basic modeling laws.

CE208 GEOTECHNICAL ENGINEERING I

CO1: Understand the properties of soils

CO2: Discuss the classifications of soil

CO3: Apply the principles of Darcy's law, permeability and seepage in soils and their effects in engineering applications."

CO4: Assess the shear strength parameters of soil

CO5: Assess the compressibility and consolidation in soil strata

CO6: Understand the stability of finite slopes

HS210 LIFE SKILLS

CO1: The students will be able to remember theories pertaining to communication, creativity, problem solving and moral development.

CO2: The students will be able to comprehend the importance of leadership qualities, code of ethics, team dynamics and communication.

CO3: The students will be able to apply skills pertaining to presentation, group discussion, technical writing, problem solving, creative and critical thinking.

CO4: The students will be able to analyse non-verbal communication cues and leadership roles

CO5: The students will be able to evaluate different perspectives that arise due to an ethical dilemma

CO6: Become an effective leader

CE232 MATERIAL TESTING LAB I

CO1: Acquire the knowledge on mechanical behavior of materials

CO2: Expose the students to the testing of different materials under the action of various load conditions

CO3: Determine the physical and mechanical characteristics of different material experimentally

CO4: Enable the students to have a clear understanding of the design for the strength and stiffness

CO5: Assess the deflection characteristics of material under various loading and support condition

CO6: Determine the strength of materials under extremely applied loads

CE234 FLUID MECHANICS LAB

CO1: To provide experience on various hydraulic machines

CO2: To acquaint the students with the measurement of various parameters

CO3: To Familiarize the theory and their application in the field of fluid mechanics

CO4: To gain practical experience in handling various hydraulic machines

CO5: Calibration of discharge measuring equipment's and nature of calibration curves in both closed and open channel flow

CO6: Stability of floating bodies and the significance of metacentric height and radius of gyration

CE301 DESIGN OF CONCRETE STRUCTURES I

CO1: Apply the fundamental concepts of limit state method

CO2: Analysis and design reinforced concrete flexural members

CO3: Understand the behavior of reinforced concrete elements in bending, shear, compression and torsion

CO4: Analyze and Design beams, slab, columns and draw the reinforcement details

CO5: Analyze and design for deflection and crack control of reinforced concrete member

CO6: Identify the knowledge related to various structural systems

CE303 STRUCTURAL ANALYSIS II

CO1: Apply three moment equation for analyzing statically indeterminate beam

CO2: Determine the slope and deflection of beams subjected to loads

CO3: Analyse indeterminate structures using moment distribution method.

CO4: Analyse indeterminate structures using Kani's method.

CO5: Discuss the analysis of beams curved in plan

CO6: Apply plastic analysis for beams and portal frames

CE305 GEOTECHNICAL ENGINEERING II

CO1: Impart an idea regarding the vertical stress development in soil due to different loading conditions

CO2: Apply the principles of lateral earth pressure for analyzing retaining structures problem

CO3: Acquire knowledge on basic concepts, theories and methods of analysis in foundation engineering.

CO4: Understand the conditions at which various types of foundations were provided.

CO5: Choose appropriate foundation system for various practical problems.

CO6: Acquire knowledge about the concept of machine foundations & importance site exploration.

CE307 GEOMATICS

CO1: Applying the proper method for balancing the error by understanding traversing, and its various methods.

CO2: Applying the different types of curves and choose the appropriate one by comprehending basics of curves.

CO3: Understanding the different types of available Global Navigation Satellite System (GNSSs) with special focus on Global Positioning System (GPS).

CO4: Understanding the advanced methods like Differential GPS & prepare a schedule to carry out GPS surveying

CO5: Applying the concept of Remote Sensing to analyse various Engineering Problems

CO6: Applying and arrive at solutions for various civil engineering aspects using Geographical Information System (GIS) tool.

CE309 WATER RESOURCE ENGINEERING

CO1: Understand the components of hydrological cycle.

CO2: Apply various methods for estimating the precipitation and runoff.

CO3: Understand the basic requirements of irrigation and various irrigation techniques.

CO4: Discuss the different stream flow measurements and river training works.

CO5: Estimate the storage capacity of reservoirs and their useful life.

CO6: Determine the yield of aquifers and wells.

CE361 ADVANCED CONCRETE TECHNOLOGY

CO1: Classify the types and properties of cement and aggregates

CO2: Recall the testing of concrete materials as per IS code

CO3: Demonstrate the properties of Fresh and Hardened concrete

CO4: Use and select special concrete depending on their specific application

CO5: Prepare the concrete mix using ACI & IS code methods

CO6: Practice nondestructive testing of concrete

CE369 DISASTER MANAGEMENT

CO1: Understand the fundamental concept of hazards, disasters and terminologies in disaster management

CO2: Describe the basic concept, causes, types, effects and risk reduction measures of earthquake and landslides

CO3: Describe the basic concept, causes, types, effects and risk reduction measures of floods and coastal disasters

CO4: Explain the causes, effects and preventive measures of soil degradation and decertification

CO5: Describe the fundamental concepts of water and air pollution

CO6: Prepare disaster management plans for common episodes of disasters

CE341 DESIGN PROJECT

CO1: Understand the engineering aspects of design with reference to simple products

CO2: Propose innovation in design of products, processes and systems

CO3: Create design that add value to products and solve technical problems

CO4: Solve and demonstrate new products in a team work

CO5: Critique innovatively about different technologies used in engineering field

CO6: Solve analyses the different problems related to engineering field

CE331 MATERIAL TESTING LAB II

CO1: The students will able to discover the properties of fresh cement

CO2: The students will able to describe various test procedures for fresh and hardened concrete

CO3: The students will able to Judge the strength of concrete

CO4: The students will able to demonstrate experiments for testing tile and bricks

CO5: The students will able to use various equipment's used for testing aggregates and cement paste

CO6: The students will able to discover the properties of fresh concrete

CE333 GEOTECHNICAL ENGINEERING LAB

CO1: Discuss about the laboratory procedures used for the determination of the index and physical properties of the soil.

CO2: Classify soil based on the basis of its properties.

CO3: Determine the field density of the soil.

CO4: Determine the permeability and shear strength of the soil

CO5: Predict the settlement characteristics of the soil.

CO6: To determine the compaction characteristics of the soil.

CE302 DESIGN OF HYDRAULIC STRUCTURES

CO1: Understand the design of canal and its maintenance.

CO2: Know the types of canal, distributaries, canal headwork's, cross-drainage and canal regulator works.

CO3: Analyse the design of various hydraulic structures

CO4: Know the application of the canal, dam and distributaries in civil engineering structures.

CO5: Perform the stability analysis of gravity dams

CO6: Explain the causes of failure of different types of dams and their design criteria.

CE304 DESIGN OF CONCRETE STRUCTURES II

CO1: Able to design of eccentrically loaded and short and slender columns using design charts.

CO2: Able to design different types of foundations.

CO3: Able to design and detail cantilever retaining wall and understand the design principles of counterfort retaining wall.

CO4: Able to design and detail circular slabs and domes.

CO5: Able to design and detail rectangular and circular water tanks using IS code coefficients (IS3370)

CO6: Have knowledge of prestressed concrete fundamentals and able to analyses pre and post tensioned beams.

CE306 COMPUTER PROGRAMMING AND COMPUTATIONAL TECHNIQUES

CO1: Understand the basic concepts in C++.

CO2: Apply looping statements, array and develop computer programs.

CO3: Understand user defined functions and storage allocation strategies.

CO4: Understand and apply the basic concepts in classes and objects.

CO5: Implement numerical techniques for solving basic engineering problems.

CE308 TRANSPORTATION ENGINEERING I

CO1: Understand the steps involved in planning and alignment of highways

CO2: Analyze the various components of geometric elements of a highway

CO3: Determine the characteristics of pavement materials and design flexible pavements

CO4: Conduct traffic engineering studies and analyses data for efficient management of roadway facilities

CO5: Understand the traffic control aids and their design

CO6: Plan and design basic airport facilities

HS300 PRINCIPLES OF MANAGEMENT

CO1: Identify the relevance of management concepts.

CO2: Describe, discuss and relate management techniques adopted within an organization

CO3: Apply management techniques for meeting current and future management challenges faced by the organization.

CO4: Compare the management theories and models critically and to inspect and question its validity in the real world.

CO5: Assess and modify different theories of management so as to relate to current management challenges.

CO6: Apply principles of management in order to execute the roles of manager.

CE362 GROUND IMPROVEMENT TECHNIQUES

CO1: Understand the different types of ground improvement techniques and soil distribution in India

CO2: Identify different types of grouts and their applications

CO3: Identify different types of chemical stabilization and their construction method

CO4: Understand about Ground Anchors, Rock Bolts and Soil Nailing

CO5: Explain different types of Compaction technics adopted in the field.

CO6: Understand about various methods of dewatering of soil.

CE374 AIR QUALITY MANAGEMENT

CO1: Understand the type of nature of air pollutants.

CO2: Know the causes and effects of air pollution.

CO3: Describe the behavior of plumes and meteorological parameters influencing the dispersion of air pollutants.

CO4: Explain the dispersion of air pollutants in the atmosphere.

CO5: Know the various air monitoring methods and standards.

CO6: Describe the various techniques that can be adopted for managing air pollution related problems.

CE332 TRANSPORTATION ENGINEERING LAB

CO1: Determine the different tests to find various properties of aggregates, bitumen and soil sub grade.

CO2: Determine the quality of various pavement materials and their suitability in highway construction.

CO3: Determine the principles of traffic engineering and apply this for efficient management of transportation facilities.

CO4: Determine the characteristics of pavement materials and design flexible pavements.

CO5: Assess the suitability of the solid and firm foundation in transportation engineering management.

CO6: Assess the suitability of in pavement construction.

CE334 COMPUTER AIDED CIVIL ENGINEERING LAB

CO1: Students will be able to use the latest software tools for Modelling, Analysis and Design of Civil Engineering Systems.

CO2: Students will be able to analyse and design structurally safe RC and Steel members.

CO3: Students will be able to apply best management practices for construction and maintenance of infrastructure facilities.

CO4: Students will have the ability to create, standardize, manage and optimize the project plan, costs, and resource utilization.

CO5: Students will be able to apply total station and EDM in distance measurement and traversing.

CO6: Students will be able to survey, map, measure and analyse data for sustainable infrastructure planning.

CE352 COMPREHENSIVE EXAM

CO1: Discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them.

CE401 DESIGN OF STEEL STRUCTURES

CO1: Understanding of IS800 design philosophies and behavior of structural steel

CO2: Analyze and design if tension members and beams

CO3: Analyze and design of columns

CO4: Analyze and design of simple bolted and welded connections

CO5: Assess loads on truss and design purlins

CE403 STRUCTURAL ANALYSIS III

CO1: Categorize approximate method for finding stress resultants in multistoried frames

CO2: Discuss comprehensive idea of matrix structural analysis with emphasis on the relative advantages of the flexibility method and the stiffness method

CO3: Analyze trusses, continuous beams, rigid frames using direct flexibility method

CO4: Analyze trusses, continuous beams, rigid frames using direct stiffness method

CO5: Illustrate finite procedure by direct stiffness method

CO6: Use the basics of structural dynamics and analyses the response of single degree of freedom systems

CE405 ENVIORNMENTAL ENGINEERING I

CO1: Estimate water demand for a community through population forecasting methods.

CO2: Become aware of collection, conveyance and distribution of water.

CO3: Understand the physical, chemical and biological characteristics of water.

CO4: Describe the different treatment methods available in a water treatment plant.

CO5: Analyze the design components of water supply systems.

CO6: Select the most appropriate technique to purify the water.

CE407 TRANSPORTATION ENGINEERING II

CO1: Compare different modes of transportation and their importance in national development

CO2: Identify different elements and geometric features of railways for design

CO3: Understand various features and design turnouts involved in railway control and operation

CO4: Understand the factors causing railway accidents and suggest preventive measures

CO5: Understand and identify suitable methods for different stages of tunnel construction based on requirement

CO6: Understand the need, construction and types of harbors, breakwaters and docks

CE409 QUANTITY SURVEYING AND VALUATION

CO1: They will able to work out the quantities of materials and labor required for different types of civil works

CO2: To have an awareness regarding specifications

CO3: The students will be able to prepare schedule of rates for various items of work

CO4: To make the students familiar with contracts and its types

CO5: The students will be able to determine value of a property

CO6: To make the students familiar with bar bending schedule for various works

CE467 HIGHWAY PAVEMENT DESIGN

CO1: Identify the pavement components

CO2: Design bituminous mixes

CO3: Analyze flexible pavements and rigid pavements

CO4: Design flexible pavements and rigid pavements

CO5: Study about different road tests

CO6: Evaluate structural condition of pavement

CE469 ENVIORNMENTAL IMPACT ASSESSMENT

CO1: Understand the different steps within environmental impact assessment

CO2: Identify the major sources of pollution and understand their effects on health and environment

CO3: Assess the impacts of various pollutants to the environment and their control measures

CO4: Evaluate the impacts and draw meaningful conclusions from the results of the EIA

CO5: Understand the standards for air, water and noise quality

CO6: Prepare EIA reports and environmental management plans

CE451 SEMINAR & PROJECT PRELIMINARY

CO1: Develop skills in doing literature survey technical presentation and report preparation

CO2: Analyze a current topic of professional interest and present it before an audience

CO3: Define and analyze an engineering problem and propose a work plan to solve it

CO4: Examine the application and feasibility of an identified problem in civil engineering

CO5: Identify a project and execute its preliminary works on final semester project

CE431 ENVIORNMENTAL ENGINEERING LAB

CO1: Determine physical characteristics of water and wastewater.

CO2: Determine chemical characteristics of water and wastewater.

CO 3: Determine biological characteristics of water and wastewater.

CO 4: Analyze and interpret laboratory results.

CO 5: Assess the suitability of water for drinking purpose.

CO 6: Assess the suitability of water for building construction.

CE402 ENVIORNMENTAL ENGINEERING II

CO1: Determine the quantity of wastewater and storm water.

CO2: Illustrate the different sewerage system and wastewater disposal methods.

CO3: Determine the physical, chemical and biological characteristics of wastewater.

CO4: Describe the various types of treatment methods for wastewater.

CO5: Examine the design components of various treatment units in wastewater treatment plants.

CO6: Select the most appropriate technique to treat the wastewater.

CE404 CIVIL ENGINEERING PROJECT MANAGEMENT

CO1: Plan and schedule a construction project

CO2: Select an appropriate construction equipment for a specific job

CO3: Familiarize the legal procedures in construction contacts

CO4: Formulate suitable quality management plan for construction

CO5: Familiarize the safety practices and procedures

CO6: Apply principles of ethics in decision making

CE474 MUNCIPAL SOLID WASTE MANAGEMENT

CO1: Applying to get a basic knowledge of waste sources, its characteristics and awareness of the ill effects of increasing solid wastes.

CO2: Understand the various methods and estimation available for managing solid wastes generated.

CO3: Understand the various collection and recovery methods for solid waste.

CO4: Understand the processing techniques for managing solid waste generated.

CO5: Applying the disposal methods for solid waste.

CO6: Understand the concept of composting methods for solid waste.

CE492 PROJECT PHASE II

CO1: Demonstrate a sound technical knowledge of their selected project topic

CO2: Review the literature and develop solutions for framed problem statement

CO3: Prepare technical report and deliver presentation.

CO4: Think innovatively on the development of components, products, processes or technologies in the engineering field

CO5: Develop design methodologies & its implementation

CO6: Apply knowledge gained in solving real life engineering problem

BT 362: SUSTAINABLE ENERGY PROCESSES

CO1: Identify global and Indian energy sources.

CO2: Discuss about the exploration of Solar Energy and its effective tapping technologies.

CO3: Explain capture, conversion and application of Wind Energy.

CO4: Explain conversion of Biomass to energy.

CO5: Demonstrate the capture of energy from oceans.

CO6: Explain Fuel cells and energy storage routes

FS482: RESPONSIBLE ENGINEERING

CO1**:** Provide basic knowledge about Human Values, Work ethics, Virtues etc.

CO2: Summarize variety of moral issues and Moral dilemmas, Professional Ideals.

CO3: Familiarize about Engineers as responsible Experimenters, Codes of Ethics.

CO4: Outline engineers Exposure to Safety and Risk, Risk Benefit Analysis

CO5: Define about the Collegiality and Loyalty, Intellectual Property Rights. Research Ethics, Industrial Standards,

CO6: Understand MNC's, Business, Environmental, Computer Ethics, Moral Leadership.