CHHATRAPATI SHIVAJI MAHARAJ INSTITUTE OF TECHNOLOGY
www.csmit.in

Affiliated to the Mumbai University, Approved By AICTE - New Dehli.

DTE Maharashtra (DTE Code : 3477)

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Course Outcomes Civil Department

Semester- Ist

Subject-Engineering Mathematics-I (FEC101)

CO1.   Illustrate the basic concepts of Complex numbers.

CO2.   Apply the knowledge of complex numbers to solve problems in hyperbolic   functions and logarithmic function.

CO3.   Illustrate the basic principles of Partial differentiation.

CO4.   Illustrate the knowledge of Maxima, Minima and Successive differentiation.

CO5.   Apply principles of basic operations of matrices, rank and echelon form of matrices to solve simultaneous equations.

CO6.   Illustrate SCILAB programming techniques to the solution of linear and simultaneous algebraic equation.

Subject-Engineering Physics -I (FEC102)

CO1   Illustrate the fundamentals of quantum mechanics and its application.

CO2.   Explain peculiar properties of crystal structure and apply them in   crystallography using X-ray diffraction techniques.

CO3.   Comprehend the concepts of semiconductor physics and applications of semiconductors in electronic devices.

CO4.   Employ the concept of interference in thin films in measurements.

CO5.   Discuss the properties of Superconductors and Supercapacitors to apply them in novel applications.

CO6. Compare the properties of engineering materials for their current and futuristic frontier applications.

Subject-Engineering Chemistry -I (FEC103)

CO1. Explain the concept of microscopic chemistry in terms of atomic and molecular orbital theory and relate it to diatomic molecules.

CO2.   Describe the concept of aromaticity and interpret it with relation to specific aromatic systems.

CO3.   Illustrate the knowledge of various types of intermolecular forces and relate it to real gases.
CO4. Interpret various phase transformations using thermodynamics.
CO5.   Illustrate the knowledge of polymers, fabrication methods, conducting polymers in various industrial fields.
CO6.   Analyze the quality of water and suggest suitable methods of treatment.

Subject-Engineering Mechanics (FEC104)
CO1.   Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
CO2.   Demonstrate the understanding of Centroid and its significance and locate the same.
CO3.   Correlate real life application to specific type of friction and estimate required force to
overcome friction.
CO4.   Establish relation between velocity and acceleration of a particle and analyze the motion by plotting the relation
CO5.   Illustrate different types of motions and establish Kinematic relations for a rigid body
CO6.   Analyze particles in motion using force and acceleration, work-energy and impulse momentum principles.

Subject-Basic Electrical Engineering (FEC105)
CO1. Apply various network theorems to determine the circuit response / behavior.
CO2. Evaluate and analyze 1-Φ circuits.
CO3. Evaluate and analyze 3-Φ AC circuits.
CO4. Understand the constructional features and operation of 1-Φ transformer.
CO5. Illustrate the working principle of 3-Φ machine.
CO6. Illustrate the working principle of 1-Φ machines.

Subject- EngineeringPhysics-I (FEL101)
CO1. Perform the experiments based on interference in thin films and analyze the results.
CO2. Verify the theory learned in the module crystallography.
CO3. Perform the experiments on various semiconductor devices and analyze their characteristics.
CO4. Perform simulation study on engineering materials

Subject- Engineering Chemistry-I (FEL102)

CO1. Determine Chloride content and hardness of water sample
CO2. Determine free acid ph of different solutions
CO3. Determine metal ion concentration
CO4. Synthesize polymers, biodegradable plastics.
CO5. Determine Viscosity of oil

Subject- Engineering Mechanics (FEL103)
CO1. Verify equations of equilibrium of coplanar force system

CO2. Verify law of moments.
CO3. Determine the centroid of plane lamina.
CO4. Evaluate co-efficient of friction between the different surfaces in contact.
CO5. Demonstrate the types of collision/impact and determine corresponding coefficient   of restitution.
CO6. Differentiate the kinematics and kinetics of a particle

Subject-Basic Electrical Engineering (FEL104)
CO1. Interpret and analyse the behaviour of DC circuits using network theorems.
CO2. Perform and infer experiment on single phase AC circuits.
CO3. Demonstrate experiment on three phase AC circuits.
CO4. Illustrate the performance of single phase transformer and machines.

Subject-Basic WorkshopPractice-I(FEL105)

CO1. Develop the necessary skill required to handle/use different fitting tools.
CO2. Develop skill required for hardware maintenance.
CO3. Able to install an operating system and system drives.
CO4. Able to identify the network components and perform basic networking and crimping.
CO5. Able to prepare the edges of jobs and do simple arc welding.
CO6. Develop the necessary skill required to handle/use different plumping tools.
CO7. Demonstrate the turning operation with the help of a simple job

Semester- IInd

Subject-Engineering Mathematics-II (FEC201)

CO1. Apply the concepts of First Order and first degree Differential equation to the problems in the field of engineering.
CO2. Apply the concepts of Higher Order Linear Differential equation to the engineering problems.
CO3. Apply concepts of Beta and Gamma function to solve improper integrals.
CO4. Apply concepts of Double integral of different coordinate systems to the engineering problems like area and mass.
CO5. Apply concepts of triple integral of different coordinate systems to the engineering problems and problems based on volume of solids.
CO6. Solve differential equations and integrations numerically using SCILAB software to experimental aspect of applied mathematics.

Subject-Engineering Physics-II (FEC202)

CO1. Describe the diffraction through slits and its applications.

CO2. Apply the foundation of laser and fiber optics in development of modern communication technology.
CO3. Relate the basics of electrodynamics which is prerequisite for satellite communications, antenna theory etc.
CO4. Explain the fundamentals of relativity.
CO5. Assimilate the wide scope of nanotechnology in modern developments and its role in emerging innovating applications.
CO6. Interpret and explore basic sensing techniques for physical measurements in modern instrumentations.

Subject-Engineering Chemistry-II (FEC203)

CO1. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
CO2. Illustrate the concept of emission spectroscopy and describe the phenomena of fluorescence and phosphorescence in relation to it.
CO3. Explain the concept of electrode potential and nernst theory and relate it to electrochemical cells.
CO4. Identify different types of corrosion and suggest control measures in industries.
CO5. Illustrate the principles of green chemistry and study environmental impact.
CO6. Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel.

Subject-EngineeringGraphics (FEC204)

CO1. Apply the basic principles of projections in Projection of Lines and Planes
CO2. Apply the basic principles of projections in Projection of Solids.
CO3. Apply the basic principles of sectional views in Section of solids.
CO4. Apply the basic principles of projections in converting 3D view to 2D drawing.
CO5. Read a given drawing.
CO6. Visualize an object from the given two views

Subject-C Programming (FEC205)

CO1. Formulate simple algorithms for arithmetic, logical problems and translate them to programs in C language
CO2. Implement, test and execute programs comprising of control structures.
CO3. Decompose a problem into functions and synthesize a complete program.
CO4. Demonstrate the use of arrays, strings and structures in C language.
CO5. Understand the concept of pointers.

Subject-ProfessionalCommunication and Ethics- I (FEC206)

CO1. Eliminate barriers and use verbal/non-verbal cues at social and workplace situations.
CO2. Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation.
CO3. Prepare effectively for speaking at social, academic and business situations.

CO4. Use reading strategies for faster comprehension, summarization and evaluation of texts.
CO5. Acquire effective writing skills for drafting academic, business and technical documents.
CO6. Successfully interact in all kinds of settings, displaying refined grooming and social skills.

Subject-Engineering Physics-II (FEL201)
CO1. Perform the experiments based on diffraction through slitsusing Laser source and analyze the results.
CO2. Perform the experiments using optical fibre to measure numerical aperture of a givenfibre.
CO3. Perform the experiments on various sensors and analyze the result.

Subject-Engineering Chemistry-II (FEL202)
CO1. Determine moisture and ash content of coal
CO2. Analyze flue gas
CO3. Determine saponification and acid value of oil
CO4. Determine flash point of a lubricating oil
CO5. Synthesize a drug and a biofuel.
CO6. Determine na/k and emf of cu-zn system

Subject-Engineering Graphics (FEL203)
CO1. Apply the basic principles of projections in 2D drawings using a CAD software.
CO2. Create, Annotate, Edit and Plot drawings using basic AutoCAD commands and features.
CO3. Apply the concepts of layers to create drawing.
CO4. Apply basic AutoCAD skills to draw different views of a 3D object.
CO5. Apply basic AutoCAD skills to draw the isometric view from the given two views
Subject-C Programming (FEL204)

CO1. Translate given algorithms to a program.
CO2. Correct syntax and logical errors.
CO3. Write iterative as well as recursive programs.
CO4. Represent data in arrays, strings and structures and manipulate them through a program.
CO5. Declare pointers and demonstrate call by reference concept.

Subject-ProfessionalCommunication and Ethics- I (FEL205)

CO1. Listen and comprehend all types of spoken discourse successfully.
CO2. Speak fluently and make effective professional presentations.
CO3. Read large quantities of text in a short time to comprehend, summarise and evaluate content.
CO4. Draft precise business letters, academic essays and technical guidelines.

CO5. Dress finely and conduct themselves with panache in social, academic and professional situations.

Subject-Basic WorkshopPractice-II (FEL206)

CO1. Develop the necessary skill required to handle/use different carpentry tools.
CO2. Identify and understand the safe practices to adopt in electrical environment.
CO3. Demonstrate the wiring practices for the connection of simple electrical load/ equipment.
CO4. Design, fabricate and assemble pcb.
CO5. Develop the necessary skill required to handle/use different masons tools.
CO6. Develop the necessary skill required to use different sheet metal and brazing tools.
CO7. Able to demonstrate the operation, forging with the help of a simple job.

Semester- III

Subject - Engineering Mathematics-III (CEC 301)

1. Apply the concept of Laplace transform to solve the real integrals in engineering problems.

2. Apply the concept of inverse Laplace transform of various functions in engineering problems.

3. Expand the periodic function by using Fourier series for real life problems and complex engineering problems.

4. Find orthogonal trajectories and analytic function by using basic concepts of complex variable theory.

5. Apply Matrix algebra to solve the engineering problems.

6. Solve Partial differential equations by applying numerical solution and analytical methods for one dimensional heat and wave equations.

Subject - Mechanics of Solids (CEC 302)

1) Evaluate stress - strain behavior of elastic members and thin cylinders subjected to internal pressure.

2) Draw variation of axial force, shear force and bending moment diagram for statically determinate beams and frames.

3) Calculate Moment of Inertia for cross sections and analyze the material response under the action of shear and the effect of flexure (bending).

4) Predict the angle of twist and shear stress developed in torsion and compute direct and bending stresses developed in the cross section of centrally and eccentrically loaded columns.

5) Locate principal planes in members and calculate principal stresses using analytical and graphical method and to calculate strain energy stored in members due to elastic deformation.

6) Evaluate slope and deflection of beams supported and loaded in different ways.

Subject - Engineering Geology (CEC 303)

1) Explain the concepts of Geology and its application for safe, stable and economic design of any civil engineering structure.

2) Interpret the lithological characters of the rock specimen and distinguish them on the basis of studied parameters.

3) Describe the structural elements of the rocks and implement the knowledge for collection and analysis of the geological data.

4) Interpret the geological conditions for the dam site and calculate RQD for the assessment of rock masses.

5) Analyze the given data and suggest rock mass rating for assessment of tunneling conditions.

6) Interpret the causes of geological hazards and implement the knowledge for their prevention.

Subject - Architectural Planning & Design of Buildings (CEC304)

1) Remember and recall the intricate details of building design and drawing.

2) Understand the basic concepts of building design and drawing.

3) Learn how to apply professional ethics and act responsibly pertaining to the norms of building design and drawing practices.

4) Identify, analyze, research literate and solve complex building design and drawing problems.

5) Have new solutions for complex building design and drawing problems.

6) Effectively communicate ideas, related to building design and drawing, both orally as well as in written format like reports & drawings.

Subject - Fluid Mechanics – I (CEC305)

1) Describe various properties of fluids and types of flow

2) Determine the pressure difference in pipe flows, application of Continuity equation and Bernoulli's theorem to determine velocity and discharge

3) Apply hydrostatic and dynamic solutions for fluid flow applications

4) Analyse the stability of floating bodies

5) Apply the working concepts of various devices to measure the flow through pipes and channels

6) Explain the compressible flow, propagation of pressure waves and stagnation properties

Subject - Mini Project -1 A (CEM 301)

1. Identify problems based on societal /research needs.

2. Apply Knowledge and skill to solve societal problems in a group.

3. Develop interpersonal skills to work as member of a group or leader.

4. Draw the proper inferences from available results through theoretical/ experimental/simulations.

5. Analyse the impact of solutions in societal and environmental context for sustainable development.

6. Use standard norms of engineering practices

7. Excel in written and oral communication.

8. Demonstrate capabilities of self-learning in a group, which leads to life long learning.

9. Demonstrate project management principles during project work.

SEMESTER – IVth

Subject - Engineering Mathematics-IV (CEC 401)

1) Apply the concept of Vector calculus to evaluate line integrals, surface integrals using Green‟s theorem, Stoke's theorem & Gauss Divergence theorem.

2) Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.

3) Apply the concept of Correlation, Regression and curve fitting to the engineering problems in data science.

4) Illustrate understanding of the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.

5) Apply the concept of probability distribution to engineering problems& testing hypothesis of small samples using sampling theory

6) Apply the concepts of parametric and nonparametric tests for analyzing practical problems.

Subject - Structural Analysis (CEC402)

1. Calculate axial forces in the Coplanartrusses by using Method of joints and method of sections and also calculate radial shear, normal thrust and bending moment in parabolic 3-Hinged arches.

2. Draw Influence Line Diagrams for axial forces in trusses, Reactions, SF and B M in beams and find their values when rolling loads are passing over them.

3. Evaluate rotation and displacement at a joint of frames and deflection at any joint of truss and will be able to compute static and kinematic indeterminacy of structure.

4. Apply Flexibility methods and make use of Clapeyron"s Theorem to analyze the indeterminate structures.

5. Analyze the indeterminate structures such as beams & simple rigid jointed frames using direct stiffness method.

6. Analyze the indeterminate structures using Moment Distribution as Stiffness method and make plastic analysis.

Subject - Surveying (CEC403)

1. 1.Apply the principles of surveying and field procedures to conduct the various surveys

2. Use various methods for taking linear and angular measurements

3. Collect, record and analyse the field data for preparing drawings.

4. Explain the advancements in instruments and methods

5.Calculate the area of land and volume of earthwork

6. Set out curves

Subject - Building Materials & Concrete Technology (CEC 404)

1. To develop and implement the conceptual knowledge of building materials in the construction industry.

2. Assess the properties of building stones and their classifications. Understand the concept of various methods of manufacturing of bricks and different types of concrete blocks.

3. To expose students to various quality control aspects of civil engineering materials by performing different lab tests on materials.

4. Identify the ingredients and properties of fresh and hardened concrete.

5. To interpret and design concrete mix for various grades for various exposure conditions.

6. To study the new technology for manufacturing, testing and quality of concrete.

Subject - Fluid Mechanics – II (CEC405)

1. Analyze flow through pipes, various losses through pipes, pipe network and power transmission through nozzle

2. Explain the concept of Laminar flow and velocity distribution through parallel plates and pipes

3. Explain the concept of Turbulent flow and velocity distribution in pipes

4. Describe boundary layer concept , boundary layer separation and flow around submerged bodies

5. Apply Moment of Momentum Principle

6. Explain the importance of dimensionless numbers, dimensional analysis and similarity behavior of model and prototype.

Subject - Mini Project -1B (CEM 401)

1) Identify problems based on societal /research needs.

2) Apply Knowledge and skill to solve societal problems in a group.

3) Develop interpersonal skills to work as member of a group or leader.

4) Draw the proper inferences from available results through theoretical/

Experimental/simulations.

5) Analyze the impact of solutions in societal and environmental context for sustainable development.

6) Use standard norms of engineering practices

7) Excel in written and oral communication.

8) Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.

9) Demonstrate project management principles during project work.

SEMESTER – Vth

Subject - Theory of Reinforced Concrete Structures (CEC501)

1. Understand the fundamentals of WSM and LSM.

2. Apply various clauses specified in IS: 456-2000 for designing structural members with safety and economy.

3. Understand the use of readymade design charts and curves from Special Publications of Bureau of Indian Standards.

4. Analyze and design various reinforced concrete elements such as beam, slab, column,footings using the concept of Limit State Method.

Subject - Applied Hydraulics (CEC502)

1 Describe impact of jet on stationary, moving, hinged and series of plates also solve the numerical based on forces acting on it.

2 Distinguish various types of turbines, Characteristic curves and its components.

3 Analyze Centrifugal pumps by incorporating velocity triangle diagrams.

4 Know the working mechanism of various Hydraulic machines.

5 Identify the hydraulic behaviour of open channel flow and design the most economical section of channels.

6 Explain mathematical relationships for hydraulic jumps, surges, and critical, uniform, and gradually-varying flows.

Subject - Geotechnical Engineering-I (CEC503)

1 Explain the basic concepts of the physical and engineering properties of soil and derive the relationships among various unit weights & other parameters.

2 Comprehend clay mineralogy and plasticity behavior of clay.

3 Analyze grain size distribution of soil and classify the soil as per IS code.

4 Evaluate the coefficient of permeability of different types of soils and draw the flow net diagram to estimate seepage discharge.

5 Compute the effective stress and pore water pressure inside the soil mass under different geotechnical conditions.

6 Evaluate the compaction parameters in laboratory and field as well as understand the necessity and methods of soil exploration.

Subject - Transportation Engineering (CEC504)

1 Compare various modes of transportation and understand basic technical aspects of

railways, airways and waterways.

2 Understand different road plans, requirements of alignments and Design horizontal and vertical geometrical elements of highways.

3 Carry out different traffic studies and analyze basic parameters of traffic engineering for efficient planning and control of traffic.

4 Design the flexible and rigid pavement as per relevant IRC codes.

5 Construct different types of pavements, use of soil stabilization and planning of highway drainage.

6 Carry out structural and functional evaluation of pavement, identify the failures and design the overlay.

Subject - Advanced Concrete Technology (CEDLO5017)

1 To use the various concrete materials and demonstrate the fresh properties of concrete.

2 To perform different testing methods of concrete.

3 To describe the durability of concrete and apply the knowledge of durability in extreme weather concreting.

4 To design the concrete mix for field application by different methods.

5 To explain the various properties of special concrete.

6 To discuss the quality of concrete and explain the acceptance criteria.

SEMESTER – VIth

Subject - Design and Drawing of Steel Structures (CEC601)

1 Use the knowledge of Limit State Design philosophy as applied to steel structures. IS 800 code clauses

2 Design bolted and welded connections.

3 Design members subjected to axial tension.

4 Design compression members, Built-up columns and column bases.

5 Design members subjected to bending moment, shear force etc.

6 Estimate design loads as per IS 875 for roof truss and design the Steel roof truss.

Subject - Water Resources Engineering (CEC602)

1 Describe National water Policy, Calculate Crop water requirement and Classify various types and methods of irrigation.

2 Estimate flood discharge and Runoff by traditional and modern usage tools for planning and management of water resources projects.

3 Apply knowledge on ground water, well hydraulics to estimate the safe yield and ground water potential

4 Analyze and design gravity dams and earthen dams with spillways for sustainable development

5 Compare different silt theories related to irrigation channel and design the same.

6 Classify and Explain various canal structures and suggest remedial measures for water logging to save fertile irrigation.

Subject - Geotechnical Engineering-II (CEC603)

1 Evaluate the consolidation parameters for the soil.

2 Calculate the shear strength parameters for the soil.

3 Calculate the factors of safety of different types of slopes under various soil condition, analyze the stability of slopes.

4 Calculate lateral earth pressure under various soil condition.

5 Calculate bearing capacity of shallow foundations using theoretical and field methods.

6 Calculate load carrying capacity of individual as well as group of pile foundation using theoretical and field methods and pile settlement.

Subject - Environmental Engineering (CEC604)

1 Analyse the quality of water and make outline of water Supply scheme.

2 Design the various units of water treatment plant and apply the advanced,miscellaneous treatments whenever necessary.

3 Build service connection of water supply from main and building drainage system at construction site along with rain water harvesting layout.

4 Analyse and plan sewerage system along with test for sewer line.

5 Design the units of sewage treatment plant. Also, able to apply the knowledge of low-cost treatment and stream sanitation.

6 Understand air pollution, noise pollution and functional elements of solid wastemanagement.

Subject - Construction Equipment & Techniques (CEDLO6013)

1 Understand the use/applications of various conventional construction equipments and select the best out of them for a particular site requirement.

2 Know modern methods/equipments used for underground as well as underwater tunnelling.

3 Compare conventional and modern methods of formwork and get acquainted with techniques used on sites with restricted space.

4 Understand the techniques involved and the equipments required thereof for laying of utility lines, bridge construction and installation of structural steel members.

5 Gain knowledge about the setting up of different kinds of the power generating structures.

6 Get acquainted with the equipments/ techniques for construction of transporting facilities.

SEMESTER – VII th

Subject - Design and Drawing of Reinforced Concrete Structures (CEC701)

1. Design G+3 RCC framed building using IS code recommendations.

2. Design different types of retaining walls with detailing of reinforcement

3. Design different types of water tanks with detailing of reinforcement.

4. Apply the basic concepts of structural dynamics

5. Evaluate the response of structure during an earthquake and calculate design forces.

6. Explain principles of Pre-stressed Concrete and its losses.

Subject - Quantity Survey, Estimation & Valuation (CEC702)

1. Apply the measurement systems to various civil engineering items of work.

2. Draft the specifications for various items of work & determine unit rates of items of works

3. Estimate approximate cost of the structures by using various methods & prepare detailed estimates of various civil engineering structures, including bar bending schedule, by referring drawings.

4. Assess the quantities of earthwork & construct mass haul diagrams.

5. Draft tender notice & demonstrate the significance of the tender as well as contract process.

6. Determine the present fair value of any constructed building at stated time.

Subject - Advanced Construction Technology (CEDLO7015)

1. Evaluate the procedure of construction techniques for sub structure of major civil engineering projects.

2. Get a thorough knowledge of various stages of construction of super structure of major civil engineering projects.

3. Gain an experience in the implementation of new construction technology on engineering concepts which are applied in field Advanced construction technology in special structures.

4. Get a diverse knowledge of the different methods of advancement in construction techniques and ground improvement techniques.

5. Learn various dredging systems for major civil engineering projects.

6. Explain the theoretical and practical aspects of rehabilitation and strengthening techniques in civil engineering along with the design and management applications.

Subject - Solid and Hazardous Waste Management (CEDLO7022)

1. Acquire the knowledge of functional elements of solid waste management.

2. Illustrate solid waste collection system, route optimization techniques, transfer station and processing of solid waste.

3. Develop the ability to plan waste minimization and processing of solid waste.

4. Explain approaches to treat the solid waste in the most effective manner for sustainable development.

5. Discuss safe methods of handling, management and disposal of hazardous waste.

6. Summarize waste management techniques used for assorted solid waste

Subject - Major Project Part-I (CEP701)

1. Review & comprehend literature in the selected domain

2. Articulate problem statement & identify the objectives

3. Identify existing methods or solutions to solve identified problem

4. Identify modern engineering tools & other resources to solve the problem

5. Formulate methodology to solve the identified problem

6. Effectively communicate their project work by writing reports & presentations

Semester VIII

Subject - Construction Management (CEC801)

1 Explain & apply the knowledge of management functions like planning, scheduling,Executing & controlling the construction projects.

2 Prepare feasible project schedule by using various scheduling techniques.

3 Gain knowledge of managing various resources & recommend best method of allocating resources to the project

4 Develop optimum relationship between time & cost for construction project

5 Implement quality & safety measures on construction sites during execution of Civil Engineering projects.

6 Describe the importance of labour acts.

Subject - Industrial Waste Treatment (CEDLO8015)

1. Explain the impact of industrial wastewater characteristics on natural streams.

2. Analyze various stream protections measures to protect the natural streams.

3. Summarize waste minimization techniques for industrial wastewater.

4. Relate biological treatment concept and summarize various treatments along with advance technologies.

5. Describe waste water generated during manufacturing process and decide the suitable treatment for effluents.

6. Evaluate legislative framework for the remediation of industrial wastewater through environmental audit, environmental impact assessment and common effluent treatment plant.

Subject - Repairs, Rehabilitation and Retrofitting of Structures (CEDLO8021)

1. Describe the concept of repair and its need.

2. Classify various causes of deterioration of concrete structure and Distresses monitoring techniques.

3. Classify various materials of repairs and their properties.

4. Explain various methods of repairs of concrete structure.

5. Describe various methods of repairs of steel structure.

6. Explain seismic retrofitting and maintenance of heritage structures.

Subject –Project Management

1. Apply selection criteria and select an appropriate project from different options.
2. Write work break down structure for a project and develop a schedule based on it.
3. Identify opportunities and threats to the project and decide an approach to deal with them strategically.
4. Use Earned value technique and determine & predict status of the project.
5. Capture lessons learned during project phases and document them for future reference

Subject – Construction Management (CEL801)

1 Summarize & apply the knowledge of management functions like planning, scheduling,Executing & controlling the construction projects.

2 Prepare feasible project schedule by using various scheduling techniques.

3 Gain knowledge of managing various resources & recommend best method of allocating resources to the project.

4 Develop optimum relationship between time & cost for construction project.

5 Implement quality & safety measures on construction sites during execution of Civil Engineering projects.

6 Explain the importance of labour acts.

Subject – Major Project- Part II (CEP801)

1: Perform on analytical, experimental or numerical method to solve identified problem

2: Produce alternative design solution to meet the functional requirements of the defined problem.

3: Represent the data in Tabular or graphical forms so as to facilitate, analysis & explain of the data.

4: Express Engineering principles & manage the finance required for the execution of the Project.

5: Infer at results, conclusion with its validation, also propose the future scope of work on the identified problem.

6: Communicate effectively their project work by writing reports and publishing technical papers based on entire project work.