Vidyavardhini's college of Engineering & Technology Vasai(w)
Department of Civil Engineering
R - 2012

Program Outcomes

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering
PO2	Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and thecultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO12	Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes

At the end of the semester graduate engineers shall be able to:	
PSO1	Employ various approaches, ideologies, code of practice for devising and executing real world problems related to Civil Engineering
PSO2	Apply knowledge of equipment and computing tools to provide innovative ideas to become quality asset of society
PSO3	Implement societal, safety, security, ecological and managing skills necessary for efficient solution

Course Outcomes

At the end of the semester student will able to:	
FEC101	**Applied Mathematics I**
FEC101.1	To Understand and apply the basic concepts of complex numbers for problens in complex numbers ,hyperbolic functions and logarithmic functions
FEC101.2	To Understand and apply basic principals of partial differentiation and its applications.
FEC101.3	To apply principals of basic operations of matrices ,rank and echelon form of matrices to solve linear simultaneous equations.Apply numerical methods to solve transcendetal equations.
FEC101.4	To illustrate the knowledge of successive differentiation.
FEC102	**Applied Physics I**
FEC102.1	Explain the concept of crystallography and apply it to different crystal structures.
FEC102.2	Apply the concept of semiconductor physics in various electronic devices.
FEC102.3	understand the properties of dielectric and magnetic materials and their applications
FEC102.4	Learn the principles behind the Acoustic Design of a Hall and also methods of production of Ultrasonic and its Applications in various fields.
FEC103	**Applied Chemistry I**
FEC103.1	Analyze the quality of water and suggest suitable methods of treatment.
FEC103.2	Illustrate Thermosoftening & Thermosetting polymers & glass transition temperature.
FEC103.3	Apply the knowledge of lubricants their properties & mechanism to avoid frictional resistance. & Interpret various phase transformations using thermodynamics
FEC103.4	Demonstrate knowledge of portland cement, refractories and CNT.
FEC104	**Engineering Mechanics**
FEC104.1	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
FEC104.2	CO2 Demonstrate the understanding of Centroid and its significance and locate the same
FEC104.3	Correlate real life application to specific type of friction and estimate required force to overcome friction
FEC104.4	Establish relation between velocity and acceleration of a particle and analyse the motion by plotting the relation
FEC104.5	Illustrate different types of motions and establish Kinematic relations for a rigid body
FEC104.6	Analyse body in motion using force and acceleration, work-energy, impulse- momentum principles
FEC105	**Basic Electrical & Electronics Engineering**
FEC105.1	Students will be able to understand fundamentals of DC circuits and apply knowledge for analyzing network theorems in DC circuits.
FEC105.2	Students will be able to learn the fundamentals and analyze single phase AC circuits and three phase AC circuits.
FEC105.3	Students will able to learn the basic operation and analyze the performance of single-phase transformer.
FEC105.4	Students will be able to Illustrate the concepts of semiconductor devices diode,BJT and its applications(Rectifeir,filter).
FEC106	**Environmental Studies**
FEC106.1	Classify essential resources and control measures for sustainable development.
FEC106.2	Illustrate sources and effects of environmental decay.
FEC106.3	Select renewable sources of energy and technology essential for sustainable development.
FEC106.4	Apply the regulations of Environmental Protection Act and other bodies for perpetuation of environment.
FEL101	**Basic Workshop practice-I**
FEL101.1	Model different prototypes in the carpentry trade such as Cross cut lap joint, Tee lap joint, Dovetel lap joint.
FEL101.2	Model various basic prototypes in the trade of fitting such as Square, Hexagonal and V Male Female joint.
FEL101.3	Perform various basic House Wiring techniques while taking care of electrical safety.
FEL101.4	Perform various basic domestic plumbing operations such as pipe cutting, threading, fitting etc.
FEC201	**Applied Mathematics II**
FEC201.1	Apply various numerical methods to solve differential equations and definite integrals.
FEC201.2	Apply first order and higher order differential equations to solve the problems in the field of engineering
FEC201.3	Apply Beta, Gamma functions and D.U.I.S. to evaluate various types of Integrations.
FEC201.4	Apply techniques of multiple integrationto find the area, mass, volume and techniques of rectification to find length of the curve.
FEC202	**Applied Physics II**
FEC202.1	Comprehend the concepts of interference & diffrcation and their applications
FEC202.2	Understand the working principles of optical fibre, laser & their applications in various tecnology
FEC202.3	Understand the principles of quantum mechanics and its key as well as effect on motion of charge partcle under electric & magnetic fields
FEC202.4	Comprehend the concept of superconductors and their applications and asssimilate the knowledge of Nanotechnology and tools used like SEM,TEM & AFM

FEC203	**Applied Chemistry II**
FEC203.1	Identify different types of corrosing & factors affecting it related to problems affecting all industries.
FEC203.2	Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel.
FEC203.3	Illustrate composition, properties of alloys & properties & application of composite material..
FEC203.4	Illustrate the principles of green chemistry
FEC204	**Engineering Drawing**
FEC204.1	Understand the basic components of engineering drawing and apply them for the projections of planes, lines solids to different planes.
FEC204.2	Understand and read drawing i.e. Project a 3D drawing to 2D views or find a missing view in 2D projections
FEC204.3	Present the drawing i.e. draw the projections of a given 3D view to 2D view projections
FEC204.4	Use and get familiarized to CAD tool to draw 3D view with the help of actual 2Dview and vice versa
FEC205	**Structured Programming Approach**
FEC205.1	Formulate the algorithms to support structured programming approach.
FEC205.2	Create solution using c programming constructs like variables, derived data type and control structures.
FEC205.3	Implement solutions to the problem using the concept of strings and functions.
FEC205.4	Solve complex computational problem using concepts of pointers, structure-union and files.
FEC206	**Communication Skills**
FEC206.1	Students will be able to develop the ability to understand the importance of communication fundamentals.
FEC206.2	Students will be able to apply techniques to improve oral communication & develop their own speaking style.
FEC206.3	Students will be able to acquire the letter writing skills and produce the letters in any given situation.
FEC206.4	Students will be able to learn all the important aspects of reading including skimming, scanning , note making and understand discourse coherence.
FEL201	**Basic Workshop practice-II**
FEL201.1	Students will be able to Model different prototypes in the carpentry trade such as Cross cut lap joint, Tee lap joint, Dovetel lap joint.
FEL201.2	Students will be able to Model various basic prototypes in the trade of fitting such as Square, Hexagonal and V Male Female joint.
FEL201.3	Students will be able to Read various basic Layout drawing; make positive and negative film, and perform PCB etching and drilling, Tinning and soldering operations.
FEL201.4	Students will be able to Dismantle and Assemble a Personal Computer, perform Basic troubleshooting and maintenance, identify network components and perform Basic networking and crimping.
SECEC301	**Applied Mathematics III**
SECEC301.1	Apply the knowledge of Laplace transform to solve ODEs
SECEC301.2	Apply the concept of Fourier Series for expansion of periodic function.
SECEC301.3	Understand the concepts of Analytic functions, Harmonic functions, Orthogonal Trajectories, Bilinear Transformation and Conformal mapping and Evaluate the Contour Integral
SECEC301.4	Solve Partial Differential Equation numerically and analytically
SECEC302	**Surveying - I**
SECEC302.1	Understand and execute the principles of surveying for civil engineering works.
SECEC302.2	Apply the principles of levelling in profile levelling for road projects, tunnelling, laying of sewer line etc.
SECEC302.3	Use the knowledge of contouring to prepare the plans and sections required for civil engineering projects.
SECEC302.4	Apply the knowledge of compass survey, its principles and theodolite travesring for various applications in civil engineering fields.
SECEC302.5	Compute the area and volume by using various surveying instruments on field
SECEC302.6	Understand and implement the concepts of plane table surveying on field to prepare maps
SECEC303	**Strength of Materials**
SECEC303.1	The students will be able to determine stress, strain, principal stresses and strains
SECEC303.2	The students will be able to analyse statically determinate beams and draw Shear Force Diagrams and Bending Moment Diagrams
SECEC303.3	The students will be able to analyse the structural behaviour of flexural members under simple bending and also analyse strain energy in beams under impact loading.
SECEC303.4	Analyse the flexural members for its structural behaviour under shear and torsion.
SECEC303.5	The students will be able to analyse the structural behaviour of flexural members under eccentric loading, analyse problems on chimneys, retaining walls etc and also analyse behaviour of columns under different loading.
SECEC303.6	The learners will be able to determine principal planes and stresses graphically and analytically and also determine deformation of thin cylinders and spherical shells under internal pressure
SECEC304	**Building Materials and Construction**
SECEC304.1	To understand & apply knowledge of different types of foundation & compare material properties of various building materials
SECEC304.2	To explain & interpret manufacturing process of basic construction materials & its application
SECEC304.3	To understand & apply the knowledge on masonary construction & finishes and paints , varnishes
SECEC304.4	To understand & apply concept of types of formworks, flooring & roofing systems
SECEC304.5	To explain & interpret manufacturing process of glass,timber & metals / alloys with their application
SECEC304.6	To ascertain the various building services, acoustics, DPC, etc
SECEC305	**Engineering Geology**
SECEC305.1	To understand the interior structure of the earth and to identify the action of geological agents like wind, river, glaciers on various landforms & natural calamities (volcanoes and earthquake)
SECEC305.2	To recognize & apply the knowledge of various types of minerals & rocks with physical properties, their textures, structures and origin
SECEC305.3	To Understand geological structure like folds, faults, joints, unconformity etc. & stratification of india
SECEC305.4	To understand and apply the concepts of structural geology to construction of dams & reservior also applying several subsurface & surface methods
SECEC305.5	To apply the concepts of structural geology to construction/selection of tunnels & understand surface and subsurface strata, the sources and zones of ground water.
SECEC305.6	To apply knowledge of ground water for recharge & Apply the preventive measures for structures in landslide and earthquake prone areas also identify use of common building stones.
SECEC306	**Fluid Mechanics -I**
SECEC306.1	Identify of various properties of fluids and state and explain different types of laws and priciples of fluid mechanics based on it
SECEC306.2	Derive the laws when fluid is at rest and calculate Hydrostatic force and is location for a given geometry
SECEC306.3	Compute force of buouyancy on a partially or fully submerged body and analyze the stability of a floating body
SECEC306.4	Classify velocity potential function and stream function and solve for velocity and Acceleration of a fluid at a given location in a fulid flow
SECEC306.5	Derive Euler's Equation of motion and construct Bernoulli's equation
SECEC306.6	Calculate the flow through various devices like orifices, mouthpieces, notches and weirs
SECEC307	**Database Information Retrieval System**
SECEC307.1	Describe the data models and schemes in DBMS
SECEC307.2	Illustrate different types of database models and phases of database models
SECEC307.3	Operate the reational model for Entity-relationship (ER) model, Extended-Entity-Realtionship model (ERR)
SECEC307.4	Employ the Structured Query Language (SQL) for the different database model
SECEC307.5	Use transcation management and cocurrency

SECEC307.6	Implement Graphical User Interface (GUI) and other visual programming codes for complex files and project works
SECEC401	**Applied Mathematics-IV**
SECEC401.1	Apply matrix theory to solve system of equations and eigen values, eigen vectors and their applications
SECEC401.2	Apply the concept of probabilility distribution and Sampling theory to Engineering problems
SECEC401.3	Apply principles vector differentiation and integral calculus to the analysis engineering problems
SECEC401.4	Apply the concepts of Correlation, Regression and optimize NLPP using various optimization techniques.
SECEC402	**Surveying- II**
SECEC402.1	Apply the knowledge of tachometric surveying for various applications in civil engineering fields.
SECEC402.2	Use the knowledge of setting out various types of curves by linear and angular methods for civil engineering projects
SECEC402.3	Apply the concepts of vertical curve setting methods for road projects
SECEC402.4	Compute setting out data from survey and design information and implement on site.
SECEC402.5	Operate Total Station & GPS for desired accuracy in surveying
SECEC402.6	Understand and establish survey control of determined accuracy using GPS, GIS and remote sensing.
SECEC403	**Structural Analysis -I**
SECEC403.1	To analyse statically determinate portal frames and to draw AFD, SFD and BMD
SECEC403.2	To analyse a statically determinate structure and to evaluate deflection parameters using geometrical methods.
SECEC403.3	To analyse a statically determinate structure and to evaluate deflection parameters using energy principle.
SECEC403.4	To analyse a statically determinate structure under the influence of moving loads
SECEC403.5	To analyse cables, suspension bridges and three hinged stiffening girders.
SECEC403.6	To analyse columns and struts subjected to eccentric loading and to evaluate a section under unsymmetrical bending and shear centre.
SECEC404	**Building Design and Drawimg - I**
SECEC404.1	Demonstrate the concept and priciple of planning and desigining of residential building
SECEC404.2	Interpret the buidling byelaws by various governing authority bodies and control rules for different residential building.
SECEC404.3	Execute various types of drawings of building structures and satisfy functional requirement for residential building
SECEC404.4	Analyze the various components of building structures
SECEC404.5	Illustarte the provisions made in the National Building Code (NBC)-2005 and IS 962 Code of practice for architectural drawing
SECEC404.6	Evaluate section, foundation plan, location plan for both (Load bearing and Framed) structure
SECEC405	**Concrete Technology**
SECEC405.1	To identify ingridients of concrete and their properties & apply them
SECEC405.2	To understand & apply the knowledge of properties of fresh and hardened concrete
SECEC405.3	To analyze and interpret concrete mix design for various grades of concrete
SECEC405.4	Implement the knowledge of HSC & HPC and determine the effects of admixtures
SECEC405.5	To study types of special concrete and ready-mix concrete in various civil engineering structures.
SECEC405.6	Execute the knowledge of repair techniques and maintenance of concrete structures for sustainable development.
SECEC406	**Fluid Mechanics - II**
SECEC406.1	To analyze the major and minor losses in pipes and determine losses due to series and increase in discharge due to parallel pipes.
SECEC406.2	To analyze the power transmission through pipes and nozzles and determine diameter required for maximum power transmission.
SECEC406.3	To design pipe network for different types of discharge.
SECEC406.4	To analyze the stagnation properties of the compressible flow.
SECEC406.5	To examine the flow through the circular pipes and parallel plates for laminar flow.
SECEC406.6	To distinguish between rough and smooth boundaries for a turbulent flow for a circular pipes
TECEC501	**Structural Analysis- II**
TECEC501.1	To determine static and kinematic indeterminacy of a structure and to distinguish between linear and non linear behaviour of materials
TECEC501.2	To analyse the behaviour of various statically determinate structures using different methods
TECEC501.3	To analyse the behaviour of various statically indeterminate structures using various flexibility methods and by stiffness matrix methods (Displacement Method)
TECEC501.4	To analyse the behaviour of various statically indeterminate structures using various stiffness methods (Slope Deflection Method).
TECEC501.5	To analyse indeterminate structure by stiffness methods (Moment Distribution Method).
TECEC501.6	To determine plastic hinge, plastic moment carrying capacity, shape factor and collapse load for single and multiple span beams
TECEC502	**Geotechnical Engineering- I**
TECEC502.1	To identify and calculate various index properties of soil.
TECEC502.2	To examine & Classify soil type using various classification systems.
TECEC502.3	To calculate permeability for given soil mass.
TECEC502.4	To calculate seepage through soil and effective stress for given soil mass.
TECEC502.5	To calculate compactive characteristics, settlement for a given soil mass.
TECEC502.6	To calculate shear strength for a given soil mass.
TECEC503	**Building Design and Drawing- II**
TECEC503.1	To employ principles of planning, D.C rules and building bye-laws for preparing of drawings for various public buildings
TECEC503.2	To understand concept of green buildings and illustrate various certification methods required for green building approval.
TECEC503.3	To sketch perspective drawings (One and Two point) of various objects and structures
TECEC503.4	To illustrate concepts of principle of town planning.
TECEC503.5	To identify various documents and drawings required for redevelopment.
TECEC503.6	To prepare various components of public building using AutoCAD
TECEC504	**Applied Hydraulics -I**
TECEC504.1	To analyze momentum principle (in pipe bends) and moment of momentum equation (in lawn sprinklers).
TECEC504.2	To analyze force exerted by jet on different planes when held stationary and moving and jet propulsion of ship. analyze
TECEC504.3	To evaluate performance of different hydraulic turbines and understand characteristics curves and unit quantities governing the turbines.
TECEC504.4	To evaluate performance of a centrifugal pump and working of a multi-stage pumps.
TECEC504.5	To differentiate between Buckingham's π and Rayleigh's method for determining dimensionless number and for application of model laws
TECEC505	**Transportation Engineering -I**
TECEC505.1	Identify various components of permanent way and their relating properties and functions
TECEC505.2	Calculate the elements of railway track and turnoouts based on geometrics
TECEC505.3	Employ knowledge of airport engineering which includes aircraft characteristics, airport planning, airport obstruction, airport marking, layout and air traffic control
TECEC505.4	Determine the dimensions of runway and taxiway and will be able to interpret the runway orientation using Wind Rose Diagram
TECEC505.5	Identify various components of water transportation systems
TECEC505.6	Utilize the knowledge of bridge engineering, types of bridges and loadings for design of bridge
TECEC506	**Business Communication and Ethics**
TECEC506.1	Develop the interpersonal skills to progress professionally by building stronger relationships
TECEC506.2	Design a technical document using precise language, suitable vocabulary and apt style
TECEC506.3	Apply the techniques to participate in GD, Interviews and write Resume

TECEC506.4	Display competence required for professional career growth
TECEC601	**Geotechnical Engineering -II**
TECEC601.1	To analyze slope stability for different conditions based on criteria of factor of safety
TECEC601.2	To calculate lateral earth pressure and other parameters for designing earth retaining structures
TECEC601.3	To calculate load bearing capacity of shallow foundation.
TECEC601.4	To calculate load bearing capacity of pile foundation.
TECEC601.5	To calculate load bearing capacity of conduits and open cuts.
TECEC601.6	To understand concepts of reinforced soil and it's application in field.
TECEC602	**Design and Drawing of Steel Structures**
TECEC602.1	To explain the Limit State Design philosophy as applied to steel structures & limit state approach to design
TECEC602.2	To design connections simple (bolted & welded) & beam to beam /column
TECEC602.3	To Predict the behavior and design members subjected to axial compression, column bases and their connection.
TECEC602.4	To Predict the behavior and design members subjected to bending, shear and their connection
TECEC602.5	To predict behavior and design members subjected to axial tension & their connections
TECEC602.6	To design welded plate girder & Calculate loading for a truss and design the complete truss
TECEC603	**Applied Hydraulics -II**
TECEC603.1	To execute the boundary layer theory on flat & curved plate and interpret the drag and lift caused due to formation of boundary layer over the surface of the body.
TECEC603.2	To examine and locate the drag and lift force on a stationary submerged body as well as development of lift on circular cylinder and air foils.
TECEC603.3	To distinguish between different cross-section for hydraulically efficient channel and derive expression for best economical channel section for uniform flow
TECEC603.4	To investigate the channel flow for specific energy, hydraulic jump, losses incurred due to hydraulic jump, gradually varied flow due to obstruction in the flow path and interpret the length of back water curve.
TECEC603.5	Distinguish between Kennedy's and Lacey's Silt theory for alluvial soil.
TECEC604	**Transportation Engineering -II**
TECEC604.1	To understand the planning of highway and calculate the geometric parameters essential for highway construction.
TECEC604.2	To understand and apply the Traffic Volume Study for the design of Highway.
TECEC604.3	To examine various materials required for pavement construction as per IRC specifications.
TECEC604.4	To calculate design parameters for flexible pavement.
TECEC604.5	To calculate design parameters for rigid pavement.
TECEC604.6	To analyze the functional and structural evaluation using emperical theories.
TECEC605	**Environmental Engineering -I**
TECEC605.1	Explain the importance of Environmental Sanitation and calculate the water demand of an area
TECEC605.2	Employ the knowledge of requirement of good distribution system and sketch the layouts and methods of distribution.
TECEC605.3	Analyze the characteristics of water and understand the basic concept of treatment of water
TECEC605.4	Identify the water treatment methods and design the specific water treatment units
TECEC605.5	Apply the knowledge of the functional elements of municipal solid waste and hazardous waste.
TECEC605.6	Identify the building water supply system, classify the fixtures and fittings and explain laying , testing and maintenance of pipe
TECEC606	**Theory of Reinforced Concrete and Prestressed Concrete**
TECEC606.1	Understand the concept of WSM, stress- strain curve, permissible stresses, beam.
TECEC606.2	Design beam by WSM method.
TECEC606.3	Design of shear reinforcement & slab by using WSM.
TECEC606.4	Analyse & design of column by using WSM and design of Footing by WSM
TECEC606.5	Understand the concept of prestress concrete, methods of prestressing, losses in prestressing. Design of prestress concrete member.
TECEC606.6	Design of prestress concrete member by using General design principles.
BECEC701	**Limit State Method for Reinforced Concrete Structures**
BECEC701.1	Understand the concepts of WSM & LSM and apply for the analysis and design of beams by WSM.
BECEC701.2	Design the beam by using LSM
BECEC701.3	Design the slab by using LSM
BECEC701.4	Design the column using LSM
BECEC701.5	Design the T , L beam ,shear, torsion reinforcement.
BECEC701.6	Design the footing using LSM.
BECEC702	**Quantity Survey Estimation and Valuation**
BECEC702.1	To calculate approximate estimates by using Plinth Area Method.
BECEC702.2	To calculate the detailed estimate of a construction project by using different methods.
BECEC702.3	To prepare the Rate Analysis for construction activities according to Indian Standard specifications (IS 1200-1964) and the current market rates as per DSR.
BECEC702.4	To understand the design drawings and prepare Bar Bending Schedule for any structure
BECEC702.5	To prepare Tender Notice for various civil engineering works.
BECEC702.6	To analyse the value of any property using different methods.
BECEC703	**Irrigation Engineering**
BECEC703.1	Understand and employ the best method of irrigation in the field
BECEC703.2	Calculate the demand of water required for agricultural land
BECEC703.3	Apply their knowledge on ground water, well hydraulics to estimate the safe yield and ground water potential
BECEC703.4	Perform analysis and design of various Irrigation systems including hydraulic structures
BECEC703.5	Use their knowledge to solve and design of water resources projects independently.
BECEC703.6	Understand the distribution system and suggest various remedial methods of water logging
BECEC704	**Environmental Engineering -II**
BECEC704.1	Identify the need of sewerage system and explain the systems of sewerage and the conveyance of sewage and determine the sewer size and velocity of flow in sewers
BECEC704.2	Classify the characteristics of sewage, summarize the sewage treatment units, and solve the numerical on primary treatment unit.
BECEC704.3	Identify the secondary treatment methods, and explain the sludge treatment and disposal and self purification of natural water bodies along with design of various secondary treatment units
BECEC704.4	Apply the knowledge of the tertiary treatment of wastewater and reclamation and reuse of wastewater.
BECEC704.5	Make use of the knowledge of basic principles of house drainage, identify the plumbing fixtures and fittings, and solve the problems on septic tank
BECEC704.6	Utilize the knowledge of air pollution, noise pollution and thermal pollution and its control measures and formulate the noise levels
BECEE7051	**Solid Waste Management**
BECEE7051.1	Identify the need of solid waste management and organize the functional elements of solid waste management system
BECEE7051.2	Make use of the knowledge of classification of the solid waste based on its sources, types, composition, and characteristics and solve the problems on energy generation
BECEE7051.3	Choose the different Waste Collection, Storage and Transportation system
BECEE7051.4	Apply the knowledge different waste processing techniques like biological and chemical conversion technologies
BECEE7051.5	Employ the knowledge of site selection, components, and Disposal of solid waste in Sanitary Landfills
BECEE7051.6	Plan the solid waste management system for Industrial, Hazardous, biomedical and electronic waste

BECEE7052	**Reinforced Concrete Repairs and Miantenanace**
BECEE7052.1	Interpret causes of deterioration of concrete structures and Suggest suitable remedy.
BECEE7052.2	Inspect and evaluate the damaged structure by assessing its structural health.
BECEE7052.3	Choose the correct material and technique for repairing the concrete structures.
BECEE7052.4	Evaluate the defect and employ the methods for protection of concrete structures.
BECEE7052.5	Employ the methods of steel protection in the field.
BECEE7052.6	Apply the knowledge to maintain the concrete structures in the working and safe condition.
BECEP706	**Project - I**
BECEP706.1	Investigate complex problem through in-depth literature survey.
BECEP706.2	Explore beyond the curriculum to identify and use appropriate methodology to solve the problems.
BECEP706.3	Implement the methodology with modern tools.
BECEP706.4	Analyze and compare the results with the standard results.
BECEP706.5	Work as an individual and contribute as a team member with effectual management skills to achieve a common objective.
BECEP706.6	Write and present their work effectively with ethical values.
BECEP706.7	Engage themselves in area of their interest applying the knowledge gained and exploring new technical trends.
BECEC801	**Design and Drawing of Reinforced Concrete Structures**
BECEC801.1	Design dog legged and open well type staircase using limit state method.
BECEC801.2	Design cantilever and counter fort type retaining wall using limit state method.
BECEC801.3	Design different types of slabs using relevant IS codes.
BECEC801.4	Deign different components of building such as beam, column and footing using relevant IS codes.
BECEC801.5	Design circular and rectangular, at ground level, underground and overhead water tanks using working stress method.
BECEC801.6	Design of simple raft subjected to symmetrical loading using limit state method.
BECEC802	**Construction Engineering**
BECEC802.1	Interpret different types of standard/special equipment used and select the correct equipment.
BECEC802.2	Analyze the optimal use of the equipment, owning, operating and maintenance & repair costs of the equipment
BECEC802.3	Select the alignment for tunnels, various methods of tunneling in soft soils as well as in hard rock.
BECEC802.4	Employ the ground improvement and soil stabilization methods such as sand drains and stone columns, use of geo synthetics and chemicals based on stability of site conditions.
BECEC802.5	Suggest mass concreting, vacuum concreting and modern slip forms techniques.
BECEC802.6	Apply the knowledge of Cladding and its maintenance procedure in the field.
BECEC803	**Construction Management**
BECEC803.1	To apply the principles and functions of Construction Management for organisational structure.
BECEC803.2	To develop a Work Break Down Structure and Bar-Charts for various construction activities.
BECEC803.3	To calculte time required for completion of project by using CPM & PERT techniques.
BECEC803.4	To analyze various resources by using Resource allocation and Resource smoothening method.
BECEC803.5	To calculate optimum Time-Cost trade-off for construction project.
BECEC803.6	To illustrate safety Measures, Quality aspects and legislation related to construction work
BECEE8041	**Industrial Waste Treatment**
BECEE8041.1	Utilize the knowledge of the characteristics and effects of industrial wastes and discuss its sampling and analysis .
BECEE8041.2	Explain the concept of self purification and evaluate the numericals based on oxygen sag curve and Streeter Phelps Equation
BECEE8041.3	Identify the aerobic and anaerobic biological treatment methods and summarize its modifications along with methods of dewatering and disposal of sludge.
BECEE8041.4	Employ the knowledge of manufacturing process , volume , characteristics and effect of raw and treated effluent and treatment methods adopted in industries.
BECEE8041.5	Make use of knowledge of Environment Impact Assessment (EIA) and Environmental Audit and discuss acts pertaining to industrial wastes/effluents
BECEE8041.6	Identify the need, operation and maintenance problems and economical aspects of Common Effluent Treatment Plant (CETP)
BECEE8042	**Appraisal Implementation of Infrastructural Projects**
BECEE8042.1	To classify projects and describe the stages of project formulation.
BECEE8042.2	To identify various studies required for preparing detailed report of construction project.
BECEE8042.3	To predict market demand of any construction project by using different methods.
BECEE8042.4	To select construction project based financial and economic aspects of the entity.
BECEE8042.5	To identify various sources of finance for project implementation.
BECEE8042.6	To identify appropriate method for project implementation.
BECEP805	**Project-II**
BECEP805.1	Investigate complex problem through in-depth literature survey.
BECEP805.2	Explore beyond the curriculum to identify and use appropriate methodology to solve the problems.
BECEP805.3	Implement the methodology with modern tools.
BECEP805.4	Analyze and compare the results with the standard results.
BECEP805.5	Work as an individual and contribute as a team member with effectual management skills to achieve a common objective.
BECEP805.6	Write and present their work effectively with ethical values.
BECEP805.7	Engage themselves in area of their interest applying the knowledge gained and exploring new technical trends.