List of CO's for session 2017-18 to 2020-21

THIRD & FOURTH SEMESTER B. E. CIVIL	
BECVE301T Mathematics - III	
After studying this subject, the students will be able to	
C301.1	Solve numerical on Fourier Series & partial differential equations.
C301.2	Apply partial differential equations in column buckling problems, behavior of structures subjected to dynamic loads and in unsteady flow problems in fluid mechanics.
C301.3	Problems related to finite element analysis using calculus of variations
C301.4	Analyze structures for static and dynamic loads using matrices and Eigen value.
C301.5	Apply Numerical methods using computers especially in structural and Fluid Mechanics where classical solutions are tedious.
C301.6	Optimize the recourses using simplex methods of linear programming.
BECVE302T Strength of Materials	
After studying this subject, the students will be able to	
C302.1	Demonstrate the behavior of materials under different stress and strain conditions.
C302.2	Construct& draw shear force and bending moment diagram for beams under loading conditions.
C302.3	Analyze the bending stress, shear stress on simple and composite beams.
C302.4	Assess the stresses due to torsion on different geometrical sections
C302.5	Estimate the deflection of beam under different loading conditions.
C302.6	Evaluate principal stresses and strains.
BECVE302P Strength of Materials (Practical)	
After performing the practical, students will be able to:	
C302.1	Demonstrate the understanding and application of various types of strain gauges.
C302.2	Evaluate various engineering properties of different materials.

C302.3	Obtain a graphical solution to SFD & BMD problems for simple beams.
BECVE303T Environmental Engineering – I	
After studying this subject, the students will be able to	
C303.1	Outline the necessity and importance of water supply scheme, sources of water supply, estimate the future population and per-capita demand.
C303.2	Illustrate the knowledge related to the water conveyance systems and the appurtenances used.
C303.3	Explain the different characteristics of water and outline various units of water supply scheme and apply the knowledge in planning and design of water supply system.
C303.4	Outline the water treatment plant and describe the function of its various units.
C303.5	Design various units of conventional water treatment plant.
C303.6	Acquire basic knowledge related to generation, collection, treatment disposal of solid waste.
BECVE 303 P Environmental Engineering – I (Practical)	
After performing the practical, students will be able to:	
C303.1	Perform different tests to ascertain physical, chemical and biological characteristic of given water sample.
C303.2	Knowledge of the importance levels of BOD & COD in a waste water treatment and know various methods to determine the same.
C303.3	Know and visualize the working of various units of Water Treatment Plant during the visit and can write a report.
BECVE304T Engineering Geology	
After studying this subject, the students will be able to	
C304.1	Demonstrate the origin of various types of minerals & rocks and describe their fundamental properties.
C304.2	Illustrate and explain the terms related to structural, mineral geology and geomorphology.
C304.3	Identify and describe dip, strikes, folds and faults
C304.4	Define the basic terms related to the earthquake and assess the safety civil engineering structures in different seismic zones.

C304.5	Apply the basic knowledge of engineering geology in assessing the suitable site for civil engineering projects like dams, tunnels.
C304.6	Know importance of geo-hydrological and geo-physical information of area in planning the civil engineering structure.
BECVE 304P Engineering Geology (Practical)	
After performing the practical, students will be able to:	
C304.1	Identify the rocks and minerals based on the knowledge of its fundamental properties.
C304.2	Identify dip and strike folds and faults and can show it on the maps.
C304.3	Know and visualize the geological phenomenon during the visit and can write a report.
BECVE305T Concrete Technology	
After studying this subject, the students will be able to	
C305.1	Demonstrate the knowledge of types, properties and role of different constituents of concrete like cement, fine and coarse aggregate, water, etc.
C305.2	Explain the batching, mixing, production, transportation and placement of concrete to achieve the desired results.
C305.3	Analyze and explain the properties of fresh and hardened concrete.
C305.4	Describe the strength and durability of concrete.
C305.5	Summarize the knowledge of the properties of admixtures and describe its application in various situations and requirement in concrete construction.
C305.6	Assess the strength of concrete based on the fundamental knowledge of nondestructive testing.
BECVE 305P Concrete Technology (Practical)	
After performing the practical, students will be able to:	
C305.1	Ascertain the properties useful in production of good concrete and do the actual mix design of concrete
C305.2	Evaluate the compressive strength of concrete & its variation.
C305.3	Examine the quality of concrete by performing non-destructive testing of the existing concrete.

BECVE401T Structural Analysis – I	
After studying the subject, the students will be able to	
C401.1	Explain concept of determinate and indeterminate structure.
C401.2	Interpret the effect of moving load and can analyze and draw the influence line diagrams.
C401.3	Choose and apply different methods and theorems in the analysis of various structures
C401.4	Compute the effect of vertical loads on beams, columns and arches and understand the phenomenon related to it.
C401.5	Adapt the concept of degree of freedom and slope deflection and can apply the knowledge in analyzing the frames.
C401.6	Demonstrate the basics matrix method of analysis of structures.
BECVE 401P Structural Analysis – I (Practical)	
After performing the practical, students will be able to:	
C401.1	Apply the knowledge of different methods of analysis of structures to analyze the structural elements.
C401.2	Apply the knowledge obtained in theorems & principles of analysis of structure and verifies the same experimentally.
C401.3	Know the working principle and use of Strain gauges and Polari-scope in structural analysis.
BECVE402T Geotechnical Engineering -I	
After studying the subject, the students will be able to	
C402.1	Explain the origin of soil and identify different types of soil.
C402.2	Evaluate the index and engineering properties of the soil
C402.3	Apply the knowledge of soil properties in determining the suitability of foundation for a particular type of soil.
C402.4	Examine the seepage and permeability of soil and classify its suitability in various engineering works.
C402.5	Evaluate the shear stresses and strength of the soil mass.
C402.6	Assess the compressibility of soil using compaction and consolidation process.

BECVE402P Geotechnical Engineering -I (Practical)	
After performing the practical, students will be able to:	
C402.1	Identify and classify the soil based on engineering properties of soil.
C402.2	Determine the density and shear strength parameters of soil of a soil using various tests
C402.3	Use different charts for classifying soil or knowing the stress under the soil.
BECVE403T Transportation Engineering – I	
After studying the subject, the students will be able to	
C403.1	Exhibit the knowledge of planning, alignment, surveys and materials required for construction of highways
C403.2	Evaluate various elements geometric design and draw appropriate conclusion.
C403.3	Demonstrate the knowledge of design, construction, inspection and maintenance of the pavement.
C403.4	Undertake various Traffic studies and apply the knowledge in planning and design of pavement and geometrics
C403.5	Describe the terms related to bridge and hydrological parameters of importance in bridge design.
C403.6	Explain different sub-structures and super-structures of a bridge and its construction, inspection and maintenance.
BECVE403P Transportation Engineering – I (Practical)	
After performing the practical, students will be able to:	
C403.1	Evaluate the strength parameters of sub-grade soil through various tests.
C403.2	Examine different physical and engineering properties of aggregates & assess its suitability for different types of roads.
C403.3	Determine the various properties of bitumen by assess its suitability for different types of roads.
BECVE404T Surveying – I	
After studying the subject, the students will be able to	
C404.1	Apply the temporary and permanent adjustments in the field survey.

C404.2	Make use of knowledge regarding various survey instruments in measuring the distances and angles and also to compute levels of different works.
C404.3	Apply the knowledge in preparing various types of maps.
C404.4	Use the knowledge to estimate the quantity (areas and volumes) of the Civil Engineering work.
C404.5	Undertake various civil engineering surveys work
C404.6	Make use of plain table survey in reproducing the site features on paper.
BECVE404P Surveying – I (Practical)	
After performing the practical, students will be able to:	
C404.1	Exhibit the knowledge of working and uses of various survey instruments.
C404.2	Take the measurement, record the measurement and perform the calculations by applying necessary adjustments.
C404.3	Collect the surveyed data and to compute the area of traverse using various instruments.
BECVE 405 T Building Construction and Material	
After studying the subject, the students will be able to	
C405.1	Identify sub-structure and super-structural components of a building and iilustrate the basic design of foundation.
C405.2	Identify, classify & compare types of building materials.
C405.3	Select appropriate material and method for building construction.
C405.4	Demonstrate the knowledge of the requirement of various building components and take-up the planning, design and construction related activities with their quality control.
C405.5	Select, plan and provide the suitable types doors and window at appropriate locations.
C405.6	Select suitable type of formworks, scaffolding and shoring under different work conditions.
FIFTH & SIXTH SEMESTER B. E.	
BECVE501T Structural Analysis -II	
After studying this subject, the students will be able to	
C501.1	Describe basic terminologies related to structural analysis.

C501.2	Apply the different methods of analysis of frames in practical problems
C501.3	Acquire basic knowledge of Stiffness Method, Formulation of stiffness matrix, transformation matrix, and load matrix for plane truss. Solution to problems for Lack of Fit, Temperature.
C501.4	Formulation of stiffness matrix, transformation matrix, and load matrix for Continuous Beam. Solution to problems for various types of loads
C501.5	Formulation of stiffness matrix, transformation matrix, and load matrix for Plane Frame. Solution to problems for various types of loads
C501.6	Exhibit the basic knowledgeand concepts related to structural dynamics, and finite element method.
BECVE501P Structural Analysis -II (Practical)	
After performing the practical, students will be able to:	
C501.1	Analysis and design different structural components using application software
C501.2	Apply the concepts of stiffness matrix for the evaluation of displacement, moments etc.
C501.3	Adapt the appropriate method todevelop the solution to engineering problems using software and modern tools.
BECVE502T Reinforced Cement Concrete Structures (RCC)	
After studying this subject, the students will be able to	
C502.1	Correlate the concepts of structural design Methods of RCC to the practical problem
C502.2	Determine the composite action of reinforced steel and concrete in reinforced concrete structural members
C502.3	Exhibit knowledge of the structural properties of materials i.e. steel and concrete in assessing the strength.
C502.4	Use the knowledge in structural planning and design of various components of buildings.
C502.5	Apply the concepts and applications of pre-stressed concrete in real problems
C502.6	Exhibit the knowledge of design of one-way & two – way slab using appropriate method
BECVE502P Reinforced Cement Concrete Structures (RCC) (Practical)	
After performing the practical, students will be able to:	

C502.1	Apply the knowledge in actual structural design for various buildings.
C502.2	Make use of structural design knowledge in reading and understanding the professional RCC drawing and draw an appropriate conclusion.
C502.3	Interpret the working drawing and actual construction practices during the site visit and compose a report of the same.
BECVE503T Fluid Mechanics-I (Theory)	
After studying this subject, the students will be able to	
C503.1	Measure and determine fluid pressures and forces on plates/surfaces, pipe bends, etc.
C503.2	Apply the principles of hydrostatics and determine the forces
C503.3	Apply the Bernoulli's equation to solve the problems in fluid flow.
C503.4	Knowledge about the basic concepts related to laminar and turbulent flow
C503.5	Apply the knowledge of various instruments in flow measurement & its control
C503.6	Exhibit the knowledge of dimensional analysis and use of dimensionless number suitably model analysis.
BECVE503P Fluid Mechanics-I (Practical)	
After performing the practical, students will be able to:	
C503.1	Determine the discharge of Venturimeter , Orifice meter, Rectangular Notch, Triangular Notch
C503.2	Estimate the coefficient of velocity and the coefficient of contraction of the orifice and mouth piece.
C503.3	Assess and interpret the condition of laminar flow, turbulent flow & Reynolds number
BECVE504T Geotechnical Engineering -II	
After studying this subject, the students will be able to	
C504.1	Exhibit the knowledge of soil exploration techniques to ascertain the properties of soil
C504.2	Analyze the stability of natural slopes, safety & sustainability of the slopes,design of retaining structures, reinforced earth walls, etc.

C504.3	Demonstrate the knowledge of various theories to evaluate earth's pressure.
C504.4	Implement the Practices of Ground Improvement Techniques.
C504.5	Apply the knowledge in evaluating various parameters like bearing capacity, settlement of foundation, shear failure, etc and implement in the design of foundation.
C504.6	Illustrate different types of pile with their constructional features and demonstrate the knowledge in evaluating the pile capacity.
BECVE505T Hydrology & Water Resources	
After studying the subject, the students will be able to	
505.1	Apply the knowledge of basics of hydrology in calculating infiltration, evaporation, total runoff.
505.2	Adapt the techniques of the Hydrographs to forecast flood discharge at various durations.
505.3	Apply the Statistical techniques to analyze the flood occurrence & frequency.
505.4	Use the knowledge pertaining to the flood to plan flood routine & emergency plans
505.5	Apply the knowledge of geo-hydrology terms in planning, assessing & computation of Ground water potential and its assessment using various techniques.
505.6	Take-up planning of water resources mini project.
BECVE506P Communicative English & Technical Writing	
After performing the practical, students will be able to:	
C506.1	Exhibit the practice of functional grammar
C506.2	Write at work, letters, draft reports and demonstrate the understanding of writing research proposal.
C506.3	Dexterous in presentation skills and participate in discussion.
BECVE601T Steel Structures	
After studying this subject, the students will be able to	
C601.1	Apply the knowledge of structural properties of steel in assessing its strength for the construction purpose.

C601.2	Acquire the knowledge of plastic analysis of structural steel components.
C601.3	Demonstrate the knowledge in design of tension, compression members and roof truss.
C601.4	Interpret the strength & properties of structural fasteners and extend the knowledge in design of connections and joints.
C601.5	Demonstrate the knowledge in design of beams and girders.
C601.6	Exhibit the knowledge of design of different types column.
BECVE601P Steel Structures (Practical)	
After performing the practical, students will be able to:	
C601.1	Calculate axially loaded member by tensions and compression members.
C601.2	Design the connection: Beam to beam, beam to column.
C601.3	Design of column & its components.
BECVE602T Surveying-II	
After studying this subject, the students will be able to	
C602.1	Carry forward the concepts of basic surveying techniques
C602.2	Operate various survey instruments effectively with precision
C602.3	Use the different techniques in various surveying problems
C602.4	Apply the concepts of modern surveying techniques & instrumentation.
C602.5	Execute project using different surveying techniques
C602.6	Adapt various photography surveys in drawing appropriate conclusion.
BECVE602P Surveying-II (Practical)	
After the conduction of practical's students should be able to	
C602.1	Acquire the knowledge of errors and precisions during the survey work.
C602.2	Handle & record measurement on instruments used in various types of surveying.
C602.3	Carry out detailed survey of an area using appropriate technique and draw topological features on the sheet.
BECVE603T Fluid Mechanics -II	

After studying this subject, the students will be able to	
C603.1	Make use of the concepts related to boundary layer theory in determination of drag and lift forces.
C603.2	Apply the knowledge of theories and equations of pipe flow in analyzing and designing the pipe network systems and its components including water hammer pressures.
C603.3	Exhibit the knowledge of uniform and critical flow through open channels and extend for the design of efficient channel sections.
C603.4	Acquire the knowledge of different techniques of dimensional analysis and its use in model testing.
C603.5	Apply the basic knowledge related to Turbines & Pumps in Water Resources planning.
C603.6	Make use of specific energy concepts in the analysis of open channel flow.
BECVE603P Fluid Mechanics -II (Practical)	
After performing the practical, students will be able to:	
C603.1	Verify basic terminology related to fluid mechanics.
C603.2	Evaluate various hydraulic parameters for an open channel flow.
C603.3	Explain the working and operation of turbines and pumps.
BECVE604P Building Design and Drawing (Practical)	
After performing the practical, students will be able to:	
C604.1	Acquire the knowledge of building bye-laws & building code
C604.2	Apply the principles of building planning, design and services; and draw submission/working drawing, perspective drawing.
C604.3	Make use of knowledge to give layout on the field as per the plan.
BECVE605T Environmental Engineering-II	
After studying this subject, the students will be able to	
C605.1	Make use of technical terms related to water & its quality, sewage, sewer, storm water, etc. in its hydraulic Design, construction, testing and maintenance.
C605.2	Categorize and characterize the waste water sample in terms of its physical & chemical characteristics.

C605.3	Take-up the work functional planning, layout and design of components of Water Treatment and Sewage Treatment Plants.
C605.4	Prepare the plan for rural sanitation provisions, perform functional design of septic tank,
C605.5	Analyze the industrial waste water and understand the process of its treatment.
C605.6	Make use of knowledge and effect of air pollution, solid waste in planning for its prevention and control.
BECVE606P Site Visit & Mini Project (Practical)	
After attending the visits, students will be able to:	
C606.1	Acquire the knowledge of various project details such as working drawings, contracts, layout, planning, drawing, estimates, Arbitration provision, licensee & licensor ,architects, structural designer, etc
C606.2	Categorize and explain various construction equipment, manpower & techniques used at site, techniques of batching, mixing, transportation and placement of different construction materials, safety measures, basic amenities to provide, inventory control
C606.3	Write a legible, correct and technically sound report after the visit.
SEVENTH & EIGHTH SEMESTER B. E. CIVIL	
BECVE701T Advanced Concrete Structures	
After studying this subject, the students will be able to	
C701.1	Apply the knowledge in design of different types of water tanks using appropriate method.
C701.2	Exhibit the knowledge of design of columns & footings subjected to various loading and conditions using appropriate method.
C701.3	Make use of knowledge in analysis design of beams for various condition.
C701.4	Demonstrate the knowledge of analysis and design of different types of retaining wall.
C701.5	Acquire the knowledge of design of different types portal frame and staircase.
C701.6	Demonstrate the knowledge of design of different types of footing.
BECVE701P Advanced Concrete Structures (Practical)	
After performing the practical, students will be able to:	
C701.1	Analyze and design various concrete member of structure.

C701.2	Make use of relevant software and use the same in analysis & design of concrete members.
C701.3	Write a report of visit to a site of concrete construction
BECVE702T Estimating and Costing	
After studying this subject, the students will be able to	
C702.1	Prepare the preliminary estimate for administrative approval & technical sanction for a civil engineering project.
C702.2	Describe the specification of the works to be undertaken, prepare the tender & contract documents and make use of knowledge of different contract submission & opening in awarding the work to the contractor.
C702.3	Explain and execute the concept of SD, EMD, MAS, Running Bill, Final Bill during the entire project
C702.4	Prepare the detailed estimate of the civil engineering projects and bar bending schedule and quantity of material.
C702.5	Demonstrate the technique of Rate analysis in estimating the exact cost of material & manpower and hence the entire project& finding the rate per unit and extend the knowledge in preparing the bill of quantities.
C702.6	Acquire the knowledge of valuation, depreciation, and rent fixation of movable and immovable assets.
BECVE702P Estimating and Costing (Practical)	
After performing the practical, students will be able to:	
C702.1	Prepare preliminary estimates and detailed estimate of the each item of the project using appropriate method and perform the rate analysis of materials and manpower to obtain exact cost of the project.
C702.2	Make use of the knowledge in drafting the Specification, tender notice, contract proposal, etc and prepare the bill of quantities for the project.
C702.3	Understand the term depreciation and methods of calculating it and make use of it in valuation of the building or commodity.
BECVE703T Air Pollution And Solid Waste Management (Elective-I)	
After studying this subject, the students will be able to	
C703.1	Make use of the knowledge of different aspects of air pollutants, its sources and effects on

	man and materials
C703.2	Acquire the knowledge of appropriate methods and equipments available to reduce the impact of air pollution on environment.
C703.3	Assess the physical and chemical characteristics of the solid waste depending upon its sources of generation.
C703.4	Illustrate the classification, collection, transportation of solid waste.
C703.5	Demonstrate the knowledge of different methods of processing of solid waste and control of its by-products
C703.6	Exhibit the knowledge of disposal techniques of solid waste.
BECVE704T Construction Management & Law/Project Management	
After studying this subject, the students will be able to	
C704.1	Demonstrate the understanding of various types of projects, modern construction techniques and will exhibit the knowledge in construction planning, scheduling and various controls.
C704.2	Exhibit the understanding in Network Analysis using CPM & PERT
C704.3	Achieve the knowledge regarding planning, allocation, utilization, operation and costing of the resources, manpower and tools & plants for any construction projects.
C704.4	Implement the quality control aspects in planning & management, modern trends project management, application of information system in management of construction projects, safety provisions and equipments.
C704.5	Make use of the knowledge of the legal aspects in construction projects through the understanding of various laws pertaining to civil engineering and architectural planning & sanctioning, labor & organizational welfare measure, provisions of arbitration and litigations.
C704.6	Understand the provisions of different Acts pertaining to The Environment, Forest, water& Air Pollution for any construction activity to be undertaken.
BECVE705T Transportation Engineering - II	
After studying this subject, the students will be able to	
C705.1	Classify the railway lines and demonstrate the knowledge of permanent way, traction and tractive efforts.
C705.2	Describe the functions and requirement of various elements of railway track and extend the knowledge in design of geometric elements of a railway track.

C705.3	Acquire knowledge of turnouts, interlocking and signaling in rail transportation and extend the knowledge in design of its elements, construction and maintenance of track.
C705.4	Explain various terms related to aircraft and airfield planning, design and operation.
C705.5	Describe the terms related to airport facilitations services and achieve the understanding traffic control in air transportation
C705.6	Exhibit the knowledge in tunnel survey, drainage, lighting and ventilation.
BECVE706P Industrial Case Study and Project Seminar	
After undergoing summer internship and taking up project work, students should be able to	
C706.1	Acquire the Civil Engineering knowledge from the industry, learn the practical aspect of the same & write detailed report on it.
C706.2	Demonstrate the knowledge of reviewing the literature available and formulate the Aim and Objective of the project based on the literature survey
C706.3	Write the report and prepare the presentation and deliver the content of the work done in the project.
BECVE801T Irrigation Engineering	
After studying this subject, the students will be able to	
C801.1	Acquire the importance and scope of irrigation engineering
C801.2	Exhibit the knowledge of methods and efficiencies of irrigation, crop water requirement.
C801.3	Acquire the knowledge in planning, design and operation of storage reservoir and make use of it in the practical situation.
C801.4	Make use of the knowledge of the basic profile of dams and use the knowledge in checking stability of various types of dams
C801.5	Describe the theories of Canal design and apply the concept to design lined and unlined canals and detailed out the cross sections.
C801.6	Solve water logging problems and provide the appropriate solution to it.
BECVE802T Pavement Analysis And Design (Elective-II)	
After studying this subject, the students will be able to	
C802.1	Describe the characteristics & structural action of different types of pavement.

C802.2	Evaluate the various parameters important for the design of flexible and rigid pavement.
C802.3	Analyze and design Flexible pavement and under different loading conditions using various techniques.
C802.4	Analyze and design Rigid pavement and under different loading conditions using various techniques.
C802.5	Propose a framework for pavement management system.
C802.6	Acquire the knowledge of pavement testing and evaluation and make use of it in strengthening, repairs, maintenance and rehabilitation of pavements.
BECVE803T Water And Waste Water Treatment (Elective - III)	
After studying this subject, the students will be able to	
C803.1	Explain the composition of typical municipal solid wastes, their sources, collection, treatment and disposal.
C803.2	Attain the ability to use the techniques, skills, and modern engineering tools necessary for environmental engineering practices.
C803.3	Demonstrate the knowledge of the stages and process of waste water treatment
C803.4	Describe working of various units of water treatment plant.
C803.5	Make use of the knowledge related to WTP in the design of different units of water &waste water treatment plant.
C803.6	Acquire the knowledge of recent development in water &waste water treatment.
BECVE803P Water And Waste Water Treatment (Elective - III) (Practical)	
After performing the practical, students will be able to:	
C803.1	Evaluate various water and waste water parameter.
C803.2	Ascertain the presence of impurities so as to evaluate the quality of water.
C803.3	Make use of the knowledge to design individual units of a WTP.
BECVE804TConstruction Economics and Finances	
After studying this subject, the students will be able to	
C804.1	Acquaint with various economic and financial aspects of construction industry

C804.2	Demonstrate the tools and techniques of economic analysis for improving their decision making skills.
C804.3	The knowledge of economics and finance with special reference to construction industry.
C804.4	Understand the concept of IRR, turnkey construction projects
C804.5	Apply knowledge of inflation, recession, financialratios.
C804.6	Acquire the knowledge of terms related with capital cost, CIBIL, etc and extend the knowledge in calculating the working capital of civil engineering projects.
BECVE805P Project	
After performing the practical, students will be able to:	
C805.1	Have the knowledge of the collection and analysis of data related to project work and apply the knowledge in actual work of the project
C805.2	Present the results obtained and write the inference of the results with scope of the work.
C805.3	Write the report and prepare the presentation and deliver the content of the work done in the project.