2020-21	
Course Outcome (COs) of CIVIL Department	
Department of Civil Engineering	
3CE2-01	**ADVANCE ENGINEERING MATHEMATICS-I**
3CE2-01.1	Apply a range of mathematical theorems and methods to solve routine and complex analytic and applied problems;
3CE2-01.2	Analyse data necessary for the solution of engineering problems
3CE2-01.3	Examine the effectiveness of proposed solutions to identified engineering problems.
3CE1-02	**TECHNICAL COMMUNICATION**
3CE1-02.1	Learner can improve his/her technical skills required at the industry levels.
3CE1-02.2	Learner can implement techncial writing, grammer and speaking in the industrial world.
3CE1-02.3	Student can learn to write technical writings, its format and various uses.
3CE3-04	**Engineering Mechanics**
3CE3-04.1	Draw free body diagrams and determine the resultant of forces and/or moments. Determine the centroid and second moment of area of sections.
3CE3-04.2	Apply laws of mechanics to determine efficiency of simple machines with consideration of friction. Analyse statically
3CE3-04.3	determinate planar frames. Analyse the motion.
3CE3-04.4	Apply Newton's laws and conservation laws to elastic collisions and motion of rigid bodies
3CE4-05	**SURVEYING**
3CE4-05.1	Handle various survey instrument for a particular survey work.
3CE4-05.2	Collect and analysis survey data for preparing drawing and maps.
3CE4-05.3	To apply check for errors estimation.
3CE4-05.4	Calculate relative altitudes and distance of different points on ground.
3CE4-05.5	Perform setting of horizontal curves in field.
3CE4-06	**FLUID MECHANICS**
3CE5A.1	Students will be able to understand the concepts of fluid statics, dynamics & kinematics.
3CE5A.2	Students will learn to analyse the pressure, buyouncy and types of flow and its characterstics.
3CE5A.3	Students be able to design the economic section for channel flow
3CE5A.4	Students will be able to generate flow parameters such as discharge, velocity, acceleration etc on the basis of flow problems.
3CE5A.5	Students be able to doffrentiate between types of flow, types of weirs & notches.
3CE4-07	**BUILDING MATERIALS AND CONSTRUCTION**
3CE4-07.1	Explain different materials especially eco-friendly materials and safety measures to be adopted at any construction site.
3CE4-07.2	Learn the various types of building materials and its engineering application.
3CE4-07.3	Gain knowledge in modern equipments and the recent techniques to be used.

3CE4-07.4	Understand the use of non-conventional Civil Engineering materials
3CE4-08	**ENGINEERING GEOLOGY**
3CE4-08.1	Explain different types of rocks & minerals found on earth.
3CE4-08.2	Explain faults and folds in earth crust.
3CE4-08.3	Explain the difference between several minerals by examining their physical & chemical properties.
3CE4-21	**Surveying Lab**
3CE4-21.1	Handle various survey instrument for a particular survey work.
3CE4-21.2	Collect and analysis survey data for preparing drawing and maps.
3CE4-21.3	To apply check for errors estimation.
3CE4-22	**Fluid Mechanics Lab**
3CE4-22.1	To verify the theorems in fluid mechanics and calibration of the instruments like venturimeter, orificmeter
3CE4-22.2	Determine different coefficients and factors involved in fluid flow
3CE4-22.3	Build knowledge on the working principles, components, functions of hydraulic equipment
3CE4-23	**Computer Aided Civil Engineering Drawing**
3CE4-23.1	Able to understand the basic command, principles and features behind autocad.
3CE4-23.2	Able to draft the plan, elevation and sectional views of buildings
3CE4-23.3	To draft 2D and 3D veiws of buildings
3CE4-24	**Civil Engineering Maretials Lab**
3CE4-24.1	To study about fly ash, different stones, different glasses, aluminum and steel sections
3CE4-24.2	To determine thevarious properties of cement
3CE4-24.3	To identification of building mateials by visual inspection
3CE4-25	**Geolgy Lab**
3CE4-25.1	To identification of minerals, rocks and woods by visual inspection and study
3CE4-25.2	Interpretation of geological map
3CE4-25.3	To understand the internal structure of earth for civil engineering aspect
3CE7-30	**Industrial Training**
3CE7-30.1	To understand the industrial work culture
3CE7-30.2	To understand the problems faced in real projects
3CE7-30.3	To enhanced communication skills and personality development

4CE2-01	**ADVANCE ENGINEERING MATHEMATICS-II**
4CE2-01.1	Apply a range of mathematical theorems and methods to solve routine and complex analytic and applied problems;
4CE2-01.2	Analyse data necessary for the solution of engineering problems
4CE2-01.3	Examine the effectiveness of proposed solutions to identified engineering problems.
4CS1-03	**MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTING**
4CS1-03.1	Develop the ability to explain core economic terms, concepts, and theories. Apply the concept of equilibrium to both microeconomics and macroeconomics.
4CS1-03.2	Explain the function of market and prices as allocative mechanisms.
4CS1-03.3	Identify key macroeconomic indicators and measures of economics change, growth, and development
4CE3-04	**BASIC ELECTRONICS FOR CIVIL ENGINEERING APPLICATIONS**
4CE3-04.1	Learner gets and idea of Introduction to Semiconductors, Diodes, V-I characteristics, Bipolar junction transistors uses.
4CE3-04.2	Learner gets knowledge of Data acquisition system and data processing.
4CE3-04.3	Students get to know the basic of Sensors & Transducers used in various instruments.
4CE4-05	**STRENGTH OF MATERIALS**
4CE4-05.1	Analyze and design structural members subjected to tension, compression, torsion, bending and combined stresses using the fundamental concepts of stress, strain and elastic behavior of materials
4CE4-05.2	Utilize appropriate materials in design considering engineering properties, sustainability, cost and weight
4CE4-05.3	Perform engineering work in accordance with ethical and economic constraints related to the design of structures
4CE4-06	**HYDRAULICS ENGINEERING**
4CE4-06.1	Explain the flow of fluids in channels
4CE4-06.2	Explain different types of turbines & pumps used.
4CE4-06.3	Explain the analytical process of deriving equation by using dimensional methods.
4CE4-07	**BUILDING PLANNING**
4CE4-07.1	Build an Articulated Plan. The obvious place to start during the planning process is building a plan.
4CE4-07.2	Focus on Strategic Differentiation. Build a plan that's focused on your strategic differentiation
4CE4-07.3	Align Your Organization
4CE4-08	**CONCRETE TECHNOLOGY**
4CE4-08.1	Understand chemistry, properties, and classification of cement, fly ash, aggregates and admixtures, and hydration of cement in concrete.
4CE4-08.2	Prepare and test the fresh concrete.
4CE4-08.3	Test hardened concrete with destructive and non-destructive testing instruments.
4CE4-08.4	Design concrete mix of desired grade.
4CE4-08.5	Get acquainted to concrete handling equipments and different special concrete types.

4CE4-21	**Material Testing Lab**
4CE4-21.1	To study about fly ash, different stones, different glasses, aluminum and steel sections
4CE4-21.2	To determine thevarious properties of cement
4CE4-21.3	To identification of building mateials by visual inspection
4CE4-22	**Hydraulics Engineering Lab**
4CE4-22.1	Explain the flow of fluids in channels
4CE4-22.2	Explain different types of turbines & pumps used.
4CE4-22.3	Explain the analytical process of deriving equation by using dimensional methods.
4CE4-23	**Building Drawing**
4CE4-23.1	To Planning and drawing of residential building with details of site plan, foundation plan, furniture plan, water supply and sanitary plan
4CE4-23.2	To planning and drawing of institutional building with details of site plan, foundation plan, furniture plan
4CE4-23.3	To planning and drawing of commertial building with details of site plan, foundation plan, furniture plan
4CE4-24	**Advanced Surveying Lab**
4CE4-24.1	Calculate relative altitudes and distance of different points on ground.
4CE4-24.2	Perform setting of horizontal curves in field.
4CE4-24.3	Carry out Survey work using Total-station.
4CE4-25	**Concrete Lab**
4CE4-25 .1	To determine the different properties of building materials like cement, concrete, aggregates through practicals
4CE4-25 .2	To design concrete mix (M-20 and M-40) in lab
4CE4-25 .3	Study about Non Destructive testing
5CE3-01	**CONSTRUCTION TECHNOLOGY AND EQUIPMENT**
5CE3-01.1	Understand the construction practices and techniques.
5CE3-01.2	Gain the knowledge about Construction Equipment and Management.
5CE3-01.3	Identify the factors to be considered in planning and construction of buildings.
5CE4-02	**STRUCTURE ANALYSIS-I**
5CE4-02.1	To understand, analyze Fixed and continuous beams.
5CE4-02.2	Able to analyze moving loads and will be able to draw influence line diagrams for simply supported beams.
5CE4-02.3	Able to analyze three hinged arches and three hinge suspension bridges.
5CE4-02.4	The student will have the knowledge on advanced methods of analysis of structures like flexibility and stiffness method, kanis method, Moment distribution method, Slope and deflection method.

5CE4-02.5	Students are able to do the analysis of beams by using an advanced method of analysis.
5CE4-03	**DESIGN OF CONCRETE STRUCTURES**
5CE4-03.1	To design various components of the structures.
5CE4-03.2	Study the development length and shear reinforcement.
5CE4-03.3	To design the axially loaded column, isolated column footing
5CE4-03.4	Designing of Domes.
5CE4-03.5	Design and analysis of beams subjected to Torsion.
5CE4-04	**GEOTECHNICAL ENGINEERING**
5CE4-04.1	Explain different types of soil present on earth crust.
5CE4-04.2	Explain different types of soil properties and their use in engineering fields.
5CE4-04.3	Analyze engineering properties of soil like compaction, permeability, and shear strength etc.
5CE4-04.4	Analyze engineering properties of soil like compaction, permeability, shear strength.
5CE4-04.5	Compute the lateral thrust due to backfill on the retaining walls.
5CE4-05	**WATER RESOURCE ENGINEERING**
5CE4-05.1	Students will be able to Understand the basics of Hydrograph, rainfall analysis and its distribution.
5CE4-05.2	Student will learn to analyse the rainfall patterns and can evaluate the same with probabilistic methods.
5CE4-05.3	Students be able to design the channels on the basis of Kennedy's theory and Lacey's theory.
5CE4-05.4	Students will be able to generate designs and layout of canal according to the use.
5CE4-05.5	Students be able to differentiate between types of canals and canal headworks.
5CE5-13	**Town Planning**
5CE5-13.1	Explain different types of buildings depending upon their uses and occupancy level.
5CE5-13.2	Explain basic criteria for planning a industrial and residential buildings.
5CE5-13.3	Explain building by laws.
5CE5-14	**Repair and Rehabilitation of Structures**
5CE5-14.1	treatment of develop cracks structure.
5CE5-14.2	Restore the structure integrity and shape of concrete elements.
5CE5-14.3	To maintain the good health of building .
5CE4-21	**Concrete Structures Design**
5CE4-21.1	To design various components of the structures.
5CE4-21.2	Study the development length and shear reinforcement.
5CE4-21.3	To design the axially loaded column, isolated column footing

5CE4-22	**Geotechnical Engineering Lab**
5CE4-22.1	Analyze engineering properties of soil like compaction, permeability, shear strength.
5CE4-22.2	Compute the lateral thrust due to backfill on the retaining walls.
5CE4-22.3	Classify soil slopes and identify their modes of failure.
5CE4-23	**Water Resource Engineering Design**
5CE4-23.1	Various components of the hydrologic cycle that affect the movement of water in the earth
5CE4-23.2	Various Stream flow measurements technique. the concepts of movement of groundwater beneath the earth
5CE4-23.3	The basic requirements of irrigation and various irrigation techniques, requirements
5CE7-30	**Industrial Training**
5CE7-30.1	To understand the industrial work culture
5CE7-30.2	To understand the problems faced in real projects
5CE7-30.3	To enhanced communication skills and personality development
6CE3-01	**WIND AND SEISMIC ANALYSIS**
6CE3-01.1	Understand the types of structures, symmetry and asymmetry in building forms, shear walls and multi-storey configurations.
6CE3-01.2	Analyze design loads for different types of buildings.
6CE3-01.3	Calculate wind load on flat roof, pitched roof and single sloped roof buildings.
6CE3-01.4	Calculate earthquake loads on framed structures and design of Earthquake Resistant Construction.
6CE4-02	**STRUCTURAL ANALYSIS-II**
6CE4-02.1	The student will have the knowledge on advanced methods of analysis of structures like flexibility and stiffness method, kanis method, Moment distribution method, Slope and deflection method.
6CE4-02.2	Students are able to do the analysis of beams by using an advanced method of analysis.
6CE4-02.3	Students are able to do analysis of portal frame
6CE4-03	**ENVIRONMENTAL ENGINEERING**
6CE4-03.1	Analyze characteristics of water and wastewater.
6CE4-03.2	Estimate the quantity of drinking water and domestic wastewater generated.
6CE4-03.3	Design components of water supply systems.
6CE-04	**DESIGN OF STEEL STRUCTURES**
6CE-04.1	Design tension and compression members.
6CE-04.2	Design beams and beam columns.
6CE-04.3	Design bolt and weld connections.

6CE-04.4	Design the gantry girder.
6CE4-05	**Estimating & Costing**
6CE4-05.1	Estimate of quantities for a Residential Building & Abstract cost Estimate
6CE4-05.2	Analyse the rates of work quantities and labour.
6CE4-05.3	Estimate the calculation of earth work quantity for roads and canals, Analyse different types of contracts, tender document for building & valuation
6CE5-12	**SOLID AND HAZARDOUS WASTE MANAGEMENT**
6CE5-12.1	To know about the solid waste management and disposal techniques.
6CE5-12.2	To know the waste management rules to generators of solid waste and its generation rate.
6CE5-12.3	To know about the biomedical waste management and hazardous solid waste management.
6CE4-21	**Environmental Engineering Design and Lab**
6CE4-21.1	Analyze characteristics of water and wastewater.
6CE4-21.2	Estimate the quantity of drinking water and domestic wastewater generated.
6CE4-21.3	Design components of water supply systems.
6CE4-22	**Steel Structure Design**
6CE4-22.1	Design tension and compression members.
6CE4-22.2	Design beams and beam columns.
6CE4-22.3	Design bolt and weld connections.
6CE4-23	**Quantity Surveying and Valuation**
6CE4-23.1	To learn about quantity surveying
6CE4-23.2	To prepare estimation for earth work, building work etc.
6CE4-23.3	To understand the aspects about valuation of building
6CE4-24	**Water and Earth Retaining Structures Design**
6CE4-24.1	To understand the design aspects about retaining structures
6CE4-24.2	Stability criteria of water and earth retaining structures
6CE4-24.3	To understand the seepage problems in retaining structures
6CE4-25	**Foundation Design**
6CE4-25.1	To design isolated shallow footings, combined footings, raft footings
6CE4-25.2	To design retaining structures
6CE4-25.3	To design pile foundation

7CE4-01	Transportation Engineering
7CE4-01.1	To understand the principles of Highway geometrics design as per IRC standards. Perform geometric design for the Highway & Basic concept of Pavement design.
7CE4-01.2	To understand Types of pavements & Materials required for highway construction. Construction procedures for different types of pavements. Maintenance procedures for different types of pavements.
7CE4-01.3	To understand the Traffic engineering & different types of traffic control device.
7AG6-60.2	**Environmental Engineering and Disaster Management**
7AG6-60.2.1	Analyze characteristics of water and wastewater.
7AG6-60.2.2	Estimate the quantity of drinking water and domestic wastewater generated.
7AG6-60.2.3	Design components of water supply systems.
7CE4-21	**Road Material Testing Lab**
7CE4-21 .1	To determine the flakiness index, Angularity number test and fineness test of given sample of aggregate.
7CE4-21 .2	Conduct a meaningful hardness, tensile, and impact test and report of the test results in a clear and userful manner.
7CE4-21 .3	Able to understand and determine of Aggregate crushing value test, specific gravity and water absorption test of aggregates.
7CE4-22	**Professional Practices & Field Engineering Lab**
7CE4-22.1	Able to do different civil engineering works
7CE4-22.2	To understand bar bending schedule
7CE4-22.3	To understand design and load factors
7CE4-23	**Soft Skills Lab**
7CE4-23.1	To develop interveiw skills
7CE4-23.2	To develop positive atitude
7CE4-23.3	to learn about Time management
7CE4-24	**Environmental Monitoring and Design Lab**
7CE4-24.1	Analyze characteristics of water and wastewater.
7CE4-24.2	Estimate the quantity of drinking water and domestic wastewater generated.
7CE4-24.3	Design components of water supply systems.
7CE7-30	**Practical Training**
7CE7-30.1	Students will get experience in designing on various design problems related to civil Engineering
7CE7-30.2	Able to understand the meaning of team work and construction activities.
7CE7-30.3	Analysis and design of structure to meet desired needs within realistic constraints

7CE7-40	Seminar
7CE7-40.1	To identify the problems and their solutions for given problem statement
7CE7-40.2	To prepapre a report and presentation on given problem statement
7CE7-40.3	To deliver presentation with good communication skill
8CE4-01	**Project Planning and Construction Management**
8CE4-01 .1	Explain the basic procedure involved in managing a project.
8CE4-01 .2	Explain the basic concepts of tasks, event, crashing an activity.
8CE4-01 .3	Explain risk factors involved and resource allocation for a good project scheduling.
8TT6-60.2	**Disaster Management**
8TT6-60.2.1	Students will understand the concept of management of resources and responsibilities for dealing with all humanitarian aspects of emergencies.
8TT6-60.2.2	Students are taught to learn the issues such as floods, hurricanes, fires, mass failure of utilities, rapid spread of disease and droughts.
8TT6-60.2.3	Studets learn how to monitor signals and indicators of both natural and man-made threat for the ecosystem.
8CE4-21	**Project Planning & Construction Management Lab**
8CE4-21.1	To understand project scheduling
8CE4-21.2	To understand contract management
8CE4-21.3	Safety and other aspects of construction management
8CE4-22	**Pavement Design**
8CE4-22.1	To gain knowledge about the process of collecting data required for design, factors affecting pavement design, and maintenance of pavement.
8CE4-22.2	To Excel in the path of analysis of stress, strain and deflection in pavement.
8CE4-22.3	To develop skills to perform functional and structural evaluation of pavement by suitable methods.
8CE7-50	**Project**
8CE7-50.1	Start and manipulate proposed engineering solutions as per industry and research requirement
8CE7-50.2	Use various tools and techniques to study existing systems
8CE7-50.3	To learn do work as an individual or in a team in project