VGNT

Subjectwise Course Outcome - [Civil Engineering - 2020-21]

C E III - I	
C301 Structural Analysis-II (CE501PC) [Theory | Regular]	
CO ID.	**Course Outcome**
C301.1	Analyze the two hinged arches.
C301.2	Solve statically indeterminate beams and portal frames using classical methods
C301.3	Sketch the shear force and bending moment diagrams for indeterminate structures.
C301.4	Formulate the stiffness matrix and analyze the beams by matrix methods
C301.5	Sketch the ILD for Indeterminate Continuous and propped cantilever beams.
C302 Geotechnical Engineering (CE502PC) [Theory | Regular]	
CO ID.	**Course Outcome**
C302.1	Characterize and classify the soils
C302.2	Able to estimate seepage, stresses under various loading conditions and compactioncharacteristics
C302.3	Able to analyse the compaction of the soils, veritcal sstress through the soils
C302.4	Able to understand compressibility of the soils
C302.5	Able to understand the strength of soils under various drainage conditions
C303 Structural Engineering 1(RCC) (CE503PC) [Theory | Regular]	
CO ID.	**Course Outcome**
C303.1	Understand the concepts involved in the design of RCC structural components
C303.2	Compare and Design the singly reinforced, doubly reinforced and flanged sections.
C303.3	Design the axially loaded, uniaxial and biaxial bending columns
C303.4	Classify the footings and Design the isolated square, rectangular and circular footings
C303.5	Distinguish and Design the one-way and two-way slabs & Design of stair cases
C304 Transportation Engineering (CE504PC) [Theory | Regular]	
CO ID.	**Course Outcome**
C304.1	An ability to apply the knowledge of mathematics, science and engineering in the areas of traffic engineering, highway development and maintenance
C304.2	An ability to design, conduct experiments to assess the suitability of the highway materials like soil, bitumen, aggregates and a variety of bituminous mixtures. Also the students will develop the ability to interpret the results and assess the suitability of these materials for construction of highways.
C304.3	An ability to design flexible and rigid highway pavements for varying traffic compositions as well as soil subgrade and environmental conditions using the standards stipulated by Indian Roads Congress.
C304.4	An ability to evaluate the structural and functional conditions of in-service highway pavements and provide solution in the form of routine maintenance measures or designed overlays using Indian Roads congress guidelines.
C304.5	An ability to assess the issues related to road traffic and provide engineering solutions supported with an understanding of road user psychological and behavioural patterns.
C305 Concrete Technology (CE511PE) [Theory | Elective]	
CO ID.	**Course Outcome**
C305.1	Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests. Recognize the effects of the rheology and early age properties of concrete on its long-term behavior.
C305.2	Apply the use of various chemical admixtures and mineral additives to design cement-based materials with tailor-made properties
C305.3	Use advanced laboratory techniques to characterize cement-based materials.
C305.4	Perform mix design and engineering properties of special concretes such as high-performance concrete, self-compacting concrete, and fibre reinforced concrete.
C305.5	Understanding different mix design methods and its applications in real time constructions.

C306 Engineering Economics and Accountancy (SM505MS) [Theory | Regular]	
CO ID.	Course Outcome
C306.1	Introduce the students with Engineering Economics
C306.2	Students get familiar with the various macro economic concepts
C306.3	Students get an insight into long term investments and capital budgeting
C306.4	Students get an understanding about the borrowings on investments
C306.5	Students get expertise in preparation of accounting statements

C307 Highway Engineering and Concrete Technology Lab (CE506PC) [Practical | Regular]	
CO ID.	Course Outcome
C307.1	Categorize the test on materials used Civil Engineering Building & Pavement constructions
C307.2	To perform the tests on concrete for it characterization
C307.3	To Design Concrete Mix Proportioning by Using Indian Standard Method
C307.4	Examine the tests performed for Bitumen mixes
C307.5	To prepare a laboratory report

C308 Geotechnical Engineering Lab (CE507PC) [Practical | Regular]	
CO ID.	Course Outcome
C308.1	Students will be able to classify soils.
C308.2	Can determine the Index properties of soils.
C308.3	Able to perform In-Situ experiments to determine dry unit weight of soil
C308.4	Able to evaluate the shear strength of soil.
C308.5	Can determine Shear strength parameters of soil through various drainage conditions.

C309 Advanced Communication Skills Laboratory (EN508HS) [Practical | Regular]	
CO ID.	Course Outcome
C309. 1	Acquire vocabulary and use it contextually
C309. 2	Listen and speak effectively
C309 .3	Develop proficiency in academic reading and writing
C309.4	Increase possibilities of job prospects
C309 .5	Communicate confidently informal and informal contexts

C310 Intellectual Property Rights [Theory | Regular]	
CO ID.	Course Outcome
C310.1	The student can be able to know and understand the importance, federal registration and types of intellectual property rights
C310.2	The student can be able to explain the trademark evaluation and registration process
C310.3	The student can understand describe the fundamentals of copyright law and illustrate international copyright law with respect to ownership and registration of copyrights
C310.4	The student can be able to describe Trade secret law and determine trade secret status and describe misappropriation right of publicity
C310.5	The student can be able to understand international trademark law, copyright law, patent law and trade secret law and describe new developments in trade

C3REG Basic Mechanical Engineering for Civil Engineering (CE402ES) [Theory | Elective]	
CO ID.	Course Outcome
C3REG.1	Student will able To understand the mechanical equipment for the usage at civil engineering systems
C3REG.2	Student will be able To familiarize with the general principles and requirement for refrigeration, manufacturing
C3REG.3	Student will be able To realize the techniques employed to construct civil engineering systems
C3REG.4	Student will be able to know and learn different manufacturing methods.

C E IV - I

C401 Transportation Engineering (CE701PC) [Theory | Regular]

CO ID.	Course Outcome
C401.1	Understand Plan highway networks
C401.2	Design highway geometrics.
C401.3	Traffic signal design and traffic characteristics
C401.4	Design Intersections and prepare traffic management plans.
C401.5	Design flexible and rigid pavements.

C402 Estimation Quantity Surveying and Valuation (CE702PC) [Theory | Regular]

CO ID.	Course Outcome
C402.1	Understand the material requirements, units, methods of estimation & applies the approximate method for building estimation.
C402.2	Understand Bar Bending requirements and methods of estimates.
C402.3	Student will able to Calculate quantity of earth work for roads and canals.
C402.4	Evaluate the rates for various items of work .
C402.5	Understand contracts & specifications, and valuation of building for different specifications.

C403 Construction Technology and Management. (CE722PE) [Theory | Elective]

CO ID.	Course Outcome
C403.1	Understand the roles and responsibilities of a project manager
C403.2	Prepare schedule of activities in a construction project
C403.3	Identify the equipment used in construction
C403.4	Understand safety practices in construction industry
C403.5	Prepare tender and contract document for a construction project

C404 Watershed Management. (CE731PE) [Theory | Elective]

CO ID.	Course Outcome
C404.1	Identify causes of soil erosion
C404.2	Quantify soil erosion and design control measures
C404.3	Plan and design water harvesting and groundwater recharge structures
C404.4	Plan measures for reclamation of saline soils
C404.5	Apply appropriate models for watershed management.

C405 Irrigation and Hydraulic Structures [Theory | Elective]

CO ID.	Course Outcome
C405.1	Plan an Irrigation System
C405.2	Analyze and design gravity dams
C405.3	Analyze earth dams and concept of spillways
C405.4	Plan and design diversion head works
C405.5	Design irrigation canals and canal network

C406 Transportation Engineering Laboratory (CE703PC) [Practical | Regular]

CO ID.	Course Outcome
C406.1	Highway construction properties of road aggregates
C406.2	Highway construction properties of bitumin
C406.3	Asses for traffic volume studies
C406.4	Asses the parking studies
C406.5	Asses the spot speed studies

C407 Environmental Engineering Laboratory (CE704PC) [Practical | Regular]

CO ID.	Course Outcome
C407.1	Analyze characteristics of water and wastewater

C407.2	Understand the importance of portable water for Human Consumption
C407.3	Understand the principles involved in designing the experiments to obtain the valid results
C407.4	Identify the quality and characteristics of water/waste water based on the results
C407.5	Understand the significance of judicious consumption and discharge of water with society at large
C408 Industrial Oriented Mini Project [Theory | Regular]	
CO ID.	Course Outcome
C408.1	To create an Industrial environment and culture within the institution
C408.2	To standardize laboratories to industrial standard, thereby giving exposure to industrial housekeeping standards
C408.3	Finding the solution of identified problem with help of modern technology
C408.4	Giving priority to real life problem
C408.5	Learning to work as a team and to focus on getting a working project done within a stipulated period of time
C409 SEMINAR (CE706PC) [Practical | Regular]	
CO ID.	Course Outcome
C409.1	To study research papers for understanding of a new field, in the absence of a textbook , to summarise and review them
C409.2	Improve the reading and writing skills
C409.3	To impart skills in preparing detailed report describing the project and results
C409.4	To effectively communicate by making an oral presentation before an evaluation committee
C409.5	Impart basic skills of communication in English through intensive practice
C E II - I	
C201 Surveying and Geomatics (CE301PC) [Theory | Regular]	
CO ID.	Course Outcome
C201.1	Apply the knowledge to calculate angles, distances and levels
C201.2	Identify data collection methods and prepare field notes
C201.3	Understand the working principles of survey instruments, measurement errors and corrective measures
C201.4	Interpret survey data and compute areas and volumes, levels by different type of equipment and relate the knowledge to the modern equipment and methodologies
C201.5	Understand the working principles in data collection by photographic images
C202 Engineering Geology (CE302PC) [Theory | Regular]	
CO ID.	Course Outcome
C202.1	Importance of geology for Civil Engineering Constructions
C202.2	Case Histories of Unsustainable Civil Engineering Constructions in the past.
C202.3	Types of Structures in Rocks and their importance.
C202.4	Precautions for building constructions in Seismic areas
C202.5	Geological considerations in the selection of Dam site and Tunneling
C203 Strength of Materials - I (CE303PC) [Theory | Regular]	
CO ID.	Course Outcome
C203.1	Describe the concepts and principles, understand the theory of elasticity including strain displacement and Hookes law relationships and perform calculations related to the strength of structured and mechanical components.
C203.2	Recognize various types loads applied on structural components of simple framing geometries and understand the nature of internal stresses that will develop within the components
C203.3	To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading
C203.4	Analyze various situations involving structural members subjected to plane stresses by application of Mohrs circle of stress
C203.5	Frame an idea to design a system, component, or process
C204 Probability and Statistics (MA304BS) [Theory | Regular]	
CO ID.	Course Outcome

C204.1	Understand the concept of Probability, Bayes Theorem, random variables Discrete and continuous random variables, expectation and variance
C204.2	Can Formulate and solve problems involving random variables
C204.3	Learn apply statistical methods for analyzing experimental data.
C204.4	Can fit a curve by the method of least squares and can apply the concepts of correlation and regression
C204.5	Know the importance of test of significance, can apply Large sample test for single proportion, difference of proportions, single mean, difference of means; Test for single mean, difference of means for small samples, test for ratio of variances for small samples.
C205 Fluid Mechanics (CE305PC) [Theory | Regular]	
CO ID.	Course Outcome
C205.1	Introduce the concepts of fluid mechanics useful in Civil Engineering applications
C205.2	Provide a first level exposure to the students to fluid statics, kinematics and dynamics
C205.3	Learn about the application of mass, energy and momentum conservation laws for fluid flows
C205.4	Train and analyse engineering problems involving fluids with a mechanistic perspective is essential for the civil engineering students
C205.5	To prepare a student to build a good fundamental background useful in the application intensive courses covering hydraulics, hydraulic machinery and hydrology
C206 Surveying Lab (CE306PC) [Practical | Regular]	
CO ID.	Course Outcome
C206.1	Apply the principle of surveying for civil Engineering Applications
C206.2	Calculate areas, draw plans and contour maps
C206.3	Write a technical laboratory report
C206.4	Operate and use surveying Equipments
C206.5	Retrieve and record ground information
C207 Strength of Materials Lab (CE307PC) [Practical | Regular]	
CO ID.	Course Outcome
C207.1	Analyze the behavior of the solid bodies subjected to various types of loading.
C207.2	Compute and Analyze engineering values (e.g. stress or strain) from laboratory measurements.
C207.3	Write a technical laboratory report
C207.4	Analyze and interpret laboratory data relating to behavior of structures and the materials they are made of, and undertake associated laboratory work individually and in teams.
C207.5	Expectation and capacity to undertake lifelong learning.
C208 Engineering Geology Lab (CE308PC) [Practical | Regular]	
CO ID.	Course Outcome
C208.1	Understand the method and ways of investigations required for Civil Engineering Projects
C208.2	Identify the various rocks,minerals depending on geological classifications
C208.3	Will able to learn geologic expertise with the engineering properties of rocks and unconsolidated materials.
C208.4	Coupling of geologic expertise and laboratory analysis in characterisation of geologic sites for civil projects and quantification of processes such as rockslides and settlements
C208.5	Writing a technical laboratory report
C209 Constitution of India (MC309) [Theory | Regular]	
CO ID.	Course Outcome
C209.1	Able to know about Drafting and Formulation of Indian constitution
C209.2	Influence from other constitutions
C209.3	Parts of Indian constitution
C209.4	Form of Government
C209.5	Fundamental rights of Indian citizens
C E I - I	
C E IV - II	

C410 INDUSTRIAL SAFETY, HEALTH AND ENVIRONMENTAL ENGINEERING [Theory | Elective]	
CO ID.	Course Outcome
C410.1	To list out important legislations related to Health, Safety and Environment
C410.2	To list out requirements mentioned in factories act for the prevention of accidents. To understand the health and welfare provisions given in factories act
C410.3	To understand the statutory requirements for an industry on registration, license and its renewal.
C410.4	To prepare onsite and offsite emergency plans.
C410.5	Understand various international acts and standards for the well-being of the society.
C411 WASTE MANAGEMENT [Theory | Elective]	
CO ID.	Course Outcome
C411.1	Identify the physical and chemical composition of wastes
C411.2	Analyze the functional elements for solid waste management.
C411.3	Analyze the functional elements for liquid waste management.
C411.4	To Understand the effluent treatment Plants and its disposal
C411.5	To study about waste water treatment
C412 INDUSTRIAL WASTE WATER TREATMENT [Theory | Elective]	
CO ID.	Course Outcome
C412.1	Identify the characteristics of industrial wastewaters
C412.2	Describe pollution effects of disposal of industrial effluent
C412.3	Identify and design treatment options for industrial wastewater
C412.4	Formulate environmental management plan
C412.5	Use appropriate modern techniques skills and tools including computer applications, necessary for engineering practice
C413 Major Project (CE801PC) [Practical | Regular]	
CO ID.	Course Outcome
C413.1	To expose students to a minor problem (academic) related any one of the following components viz. design of structures, geotechnical investigations, water supply distribution system, irrigation engineering and highway design.
C413.2	To develop acumen for higher education and research
C413.3	To master the art of working in group, and develop understanding of technical dissertation presentation and writing
C413.4	To improve technical knowledge and state-of-the art practice related to the chosen topic
C E III - II	
Computer Aided Design Lab (CE606PC) [Practical | Regular]	
CO ID.	Course Outcome
C318.1	Model the geometry of real-world structure Represent the physical model of structural element/structure
C318.2	Perform analysis
C318.3	Interpret from the Post processing results
C318.4	Design the structural elements and a system as per IS Codes
C318.5	Analysis and Design of Structures as per IS 456 Code and extract the output
Environmental Science (MC609) [Practical | Elective]	
CO ID.	Course Outcome
C319.1	Based on this course, the Engineering graduate will understand / evaluate / develop technologies on the basis of ecological principles,Based on this course, the Engineering graduate will understand / evaluate / develop technologies on the basis of ecological principles
C319.2	Assess/Evaluate environmental regulations which in-turn helps in sustainable development.
C319.3	Understand the need for preparation of an Environmental Impact Assessment Report before the start of any developmental project to reduce its impacts on environment and its components.
C319.4	Need for sustainable growth and development
C319.5	Conservation of faster depleting resources, prevention of extinction of biological species and degradation of ecosystems.

C311 Hydrology and Water Resources Engineering (CE601PC) [Theory | Regular]	
CO ID.	Course Outcome
C311.1	Explain the aspects in engineering hydrology and able to estimate the average rainfall and its consistency over a basin
C311.2	Identify and apply the methods involved in estimation the losses from rainfall
C311.3	Compute direct runoff from total rainfall and able to develop unit hydrograph and storm hydrograph
C311.4	Apply the principals to determine aquifer parameters & yield of wells and estimate the surface irrigation water requirements
C311.5	Able to analyse the irrigation water requirement and design suitable canal

C312 Environmental Engineering (CE602PC) [Theory | Regular]	
CO ID.	Course Outcome
C312.1	Assess characteristics of water and wastewater and their impacts
C312.2	Estimate quantities of water and waste water and plan conveyance components
C312.3	Design components of water and waste water treatment plants
C312.4	Be conversant with issues of air pollution and control
C312.5	Estimate the water distribution capacity

C313 Foundation Engineering (CE603PC) [Theory | Regular]	
CO ID.	Course Outcome
C313.1	Understand the principles and methods of Geotechnical Exploration
C313.2	Decide the suitability of soils and check the stability of slopes
C313.3	Calculate lateral earth pressures and check the stability of retaining walls
C313.4	analyse and design the shallow foundations
C313.5	Analyse and Design pile Foundations

C314 Structural Engineering 2(STEEL) (CE604PC) [Theory | Regular]	
CO ID.	Course Outcome
C314.1	Analyze the tension members, compression members.
C314.2	Design the tension members, compression members and column bases and joints and connections
C314.3	Analyze and Design the beams including built-up sections and beam and connections.
C314.4	Identify and Design the various components of welded plate girder including stiffeners
C314.5	Design of Gantry Girder and roof trusses

C315 Prestressed Concrete (CE611PE) [Theory | Elective]	
CO ID.	Course Outcome
C315.1	Acquire the knowledge of evolution of process of prestressing.
C315.2	Acquire the knowledge of various prestressing techniques.
C315.3	Develop skills in analysis design of prestressed structural elements as per the IS codal Provisions
C315.4	Understand the concepts of transfer of prestress in pretensioned members
C315.5	Analysis of composite beams and importance of deflections

C316 Cyber Law and Ethics (CS602OE) [Theory | Elective]	
CO ID.	Course Outcome
C316.1	The students will understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.
C316.2	The students will learn the rights and responsibilities as an employee, team member and a global citizen
C316.3	The students will understand how to over come from law ethics and hackers ethics.
C316.4	The rights and responsibilities as an employee, team member and a global citizen to understand the work on it.

C317 Environmental Engineering Lab (CE605PC) [Practical | Regular]	
CO ID.	Course Outcome
C317.1	Analyze characteristics of water and wastewater

C317.2	Understand the importance of portable water for Human Consumption
C317.3	Understand the principles involved in designing the experiments to obtain the valid results
C317.4	Identify the quality and characteristics of water/waste water based on the results
C317.5	Understand the significance of judicious consumption and discharge of water with society at large
C E II - II	
218 Basic Electrical and Electronics Engineering Lab (EE409ES) [Practical | Regular]	
CO ID.	Course Outcome
C217.1	To analyze and solve electrical circuits using network laws and theorems
C217.2	To understand and analyze basic Electric and Magnetic circuits
C217.3	To study the working principles of Electrical Machines
C217.4	To introduce components of Low Voltage Electrical Installations
C217.5	To identify and characterize diodes and various types of transistors
C209 Gender Sensitization Lab (MC409) [Practical | Regular]	
CO ID.	Course Outcome
C219.1	Students will have developed a better understanding of important issues related to gender in contemporary India.
C219.2	Students will be sensitized to basic dimensions of thebiological, sociological, psychological and legal aspects ofgender. This will be achieved through discussion of materialsderived from research, facts, everyday life, literature and film.
C219.3	Students will attain a finer grasp of how gender discriminationworks in our society and how to counter it.
C219.4	Students will acquire insight into the gendered division of labour and its relation to politics and economics
C219.5	Men and women students and professionals will be better equipped to work and live together as equals
C219.6	Students will develop a sense of appreciation of women in allwalks of life
C219.7	Through providing accounts of studies and movements as wellas the new laws that provide protection and relief to women,the textbook will empower students to understand andrespond to gender violence
C210 Basic Electrical and Electronics Engineering (EE401ES) [Theory | Regular]	
CO ID.	Course Outcome
C210.1	Solve electrical circuits using network laws
C210.2	Apply the installation steps for electrical appliances and calculate electricity bill
C210.3	Analyze the various electrical machines for different applications
C210.4	Draw the characteristics of diodes and design the filters for rectifiers
C210.5	Draw the characteristics of various types of transistors
C211 Basic Mechanical Engineering for Civil Engineers (CE402ES) [Theory | Regular]	
CO ID.	Course Outcome
C211.1	Student will able To understand the mechanical equipment for the usage at civil engineering systems
C211.2	Student will be able To familiarize with the general principles and requirement for refrigeration, manufacturing
C211.3	Student will be able To realize the techniques employed to construct civil engineering systems
C212 Building Materials, Construction and Planning (CE403PC) [Theory | Regular]	
CO ID.	Course Outcome
C212.1	Define the Basic terminology that is used in the industry
C212.2	Categorize different building materials, properties and their uses
C212.3	Understand the Prevention of damage measures and good workmanship
C212.4	Explain different building services
C212.5	Understands principles of Building planning & Building Bye Laws
C213 Strength of Materials - II (CE404PC) [Theory | Regular]	
CO ID.	Course Outcome

C213.1	Describe the concepts and principles, understand the theory of elasticity, and perform calculations, relative to the strength of structures and mechanical components in particular to torsion and direct compression
C213.2	To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading
C213.3	Analyze strength and stability of structural members subjected to Direct, and Direct and Bending stresses
C213.4	Understand and evaluate the shear center and unsymmetrical bending
C213.5	Frame an idea to design a system, component, or process
C214 Hydraulics and Hydraulic Machinery (CE405PC) [Theory | Regular]	
CO ID.	Course Outcome
C214.1	Apply their knowledge of fluid mechanics in addressing problems in open channels and hydraulic machinery
C214.2	Understand and solve problems in uniform, gradually and rapidly varied flows in open channel in steady-state conditions
C214.3	Apply dimensional analysis and to differentiate the model, prototype and similitude conditions for practical problems
C214.4	Get the knowledge on different hydraulic machinery devices and its principles that will be utilized in hydropower development and for other practical usages
C214.5	Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.
C215 Structural Analysis - I (CE406PC) [Theory | Regular]	
CO ID.	Course Outcome
C215.1	Analyse the statically indeterminate bars and continuous beams
C215.2	Draw strength behavior of members for static and dynamic loading
C215.3	Calculate the stiffness parameters in beams and pin jointed trusses
C215.4	Understand the indeterminacy aspects to consider for a total structural system
C215.5	Identify, formulate, and solve engineering problems with real time loading
C216 Computer Aided Civil Engineering Drawing (CE407PC) [Practical | Regular]	
CO ID.	Course Outcome
C216.1	Able to master the usage of Auto Cad commands for drawing 2D & 3D building drawings required for different civil engineering applications.
C216.2	Apply basic concepts to develop construction (drawing) techniques
C216.3	By using Editing tools, able to manipulate drawings through editing and plotting techniques
C216.4	Produce 2D plans, cross sections and elevations of buildings
C216.5	Understand and demonstrate dimensioning concepts and techniques
C218 Hydraulics and Hydraulic Machinery Lab (CE409PC) [Practical | Regular]	
CO ID.	Course Outcome
C218.1	Describe the Basic measurement Techniques of Fluid mechanics and its appropriate application
C218.2	Interpret the Results obtained in the laboratory for various experiments
C218.3	Discover the practical working of Hydraulic Machines
C218.4	Compare the results of Analytical models introduced in lecture to the actual behavior of Real fluid flows and Draw correct and sustainable conclusions
C218.5	Write a Technical Laboratory Report