MGM's College of Engineering, Nanded

Department of Civil Engineering

Course Outcomes

Class: S. Y. B. Tech [Civil Engineering]

Courses	CO ID	Course Outcomes
Semester III: Mathematics - III C201 BTBSC301 [Theory]	C201.1	Apply the Laplace Transform technique to evaluate integrals, differential equations and their applications to engineering problems.
	C201.2	Demonstrate the concept of Partial Differential Equation and their applications to engineering problems.
	C201.3	Apply the Fourier Transform technique to evaluate improper integral and their applications to engineering problems.
	C201.4	Identify the analytic function and their applications to solve complex integrals
	C201.5	Discuss the complex transformations and their applications to rotate, translate and magnify the images.
Semester III: Mechanics of Solids C202 BTCVC302 [Theory]	C202.1	Apply the theory of solid mechanics to calculate forces, deflections, moments, stresses, and strains in structural members, subjected to different loading conditions.
	C202.2	Compute principal stresses, maximum shearing stresses, and the stresses acting on any arbitrary plane within a structural element.
	C202.3	Select appropriate materials for the design, considering engineering properties, sustainability, cost and weight.
	C202.4	Identify the fundamental elements involved in the design of engineering structures addressing collapse, durability and stability.

Semester III: Hydraulics-I C203 BTCVC303 [Theory]	C203.1	Identify types of flow and examine stress strain relationship
	C203.2	Determine the properties of fluid along with their measurement.
	C203.3	Analyze flow through pipes and losses.
	C203.4	Apply dimensional analysis to predict physical parameters of fluid
	C203.5	Analyze shear stress distribution in laminar and turbulent flow.
Semester III:Surveying-I C204 BTCVC304 [Theory]	C204.1	Apply concepts of linear/ angular measurements to develop the map
	C204.2	Prepare the map using topographical survey with different instruments
	C204.3	Discuss the Reconnaissance, preliminary, locations survey for engineering project
	C204.4	Apply concepts of linear/ angular measurements to develop the map
Semester III:Building Construction C205 BTCVC305 [Theory]	C205.1	Identify type of masonry structures
	C205.2	Discuss the composition of concrete and effect of various parameters affecting strength.
	C205.3	Identify components of building and their purposes.
	C205.4	Compare the precast and pre-engineered building construction techniques.
Semester III:Engineering Geology C206 BTCVC306 [Theory]	C206.1	Identify different land forms which are formed by various geological agents.
	C206.2	Identify physical properties of minerals and rocks.
	C206.3	Discuss geological structures which have influence on the civil engineering structure.
	C206.4	Discuss various geological conditions affect the design parameters of structures

Semester III:Soft Skills Development C207.1 BTHM303 [Theory]	C207.1	Acquire interpersonal communication skills
	C207.2	Plan goal setting: short term goal and long term goal and acquire business etiquette
	C207.3	Comprehend self-evaluation, self-discipline and self-motivation skills
	C207.4	Develop time management, leadership and presentation team building skills

Semester III:Hydraulics – I C208 BTCVL307 [Laboratory]	C208.1	Identify various properties of fluids and measurement techniques
	C208.2	Calibrate various pressure measuring devices.
	C208.3	Discuss behavior various fluids under mechanism of Viscosity.
	C208.4	Analyze stability of floating bodies.
Semester III:Surveying – I C209 BTCVL308 [Laboratory]	C209.1	Use the theodolite along with chain /tape on the field and develop the drawing
	C209.2	Apply geometric and trigonometric principles of basic surveying calculation
	C209.3	Plan a survey,taking accurate measurement, field book and adjustment of errors
	C209.4	Apply field procedures in basic types of surveys, as part of a surveying team
Semester III:Building Construction Drawing C210 BTCVL309[Laboratory]	C210.1	Prepare plan, elevation and section of various structures
	C210.2	Apply the principles of planning and by laws for building planning
	C210.3	Draw detailed working drawing for various components of building
	C210.4	Prepare plan, elevation and section of various structures
Semester III:Engineering Geology C211 BTCVL310 [Laboratory]	C211.1	Discuss and demonstrate physical properties of minerals.
	C211.2	Identify mineral and rock based on properties.
	C211.3	Discuss geological model and draw cross section of geological map.
	C211.4	Discuss bore log for subsurface geological investigation.

Semester III:Seminar-Foundation Work C212 BTCVS311 [Laboratory]	C212.1	Compile geotechnical aspects for site of foundation ,visited
	C212.2	Identify various construction tools and equipment s used used on site.
	C212.3	Identify type of foundation and masonry use for the same
	C212.4	Collect all the data observed on site and demonstrate it technically by preparing report on it.
Semester III: Field Training/ Internship C213 BTCVF312 [Laboratory]	C213.1	Compile geotechnical aspects for site of foundation visited
	C213.2	Identify various construction tools and equipments used on site.
	C213.3	Identify type of foundation and masonry use for the same
	C213.4	Collect all the data observed on site and demonstrate it technically by preparing report on it.
	C213.5	To impart communication skills by delivering presentation on report of site.

Semester IV: Hydraulics-II C214 BTCVC401 [Theory]	C214.1	Design open channel sections in a most economical way.
	C214.2	Analyze non-uniform flows in open channel and its characteristics.
	C214.3	Apply momentum principle for impact of jets on plates and its use for hydraulic machines
	C214.4	Discuss boundary layer theory and its applications.
Semester IV: Surveying -II C215 BTCVC402 [Theory]	C215.1	Discuss different types of curves.
	C215.2	Discuss Tachometric survey.
	C215.3	Use different geodetic methods of survey.
	C215.4	Discuss advanced surveying techniques
Semester IV: Structural Mechanics -I C216 BTCVC403 [Theory]	C216.1	Discuss the concept of structural analysis, degree of indeterminacy.
	C216.2	Compute slope and deflection
	C216.3	Analyze determinate and indeterminate trusses
	C216.4	Analyze indeterminate beam and frames by different methods
Semester IV: Numerical Methods in Engineering C217A BTCVE404A [Theory]	C217A.1	Apply different numerical methods to find solution of system of algebraic equations.
	C217A.2	Discuss the numerical solution of ordinary differential equation.
	C217A.3	Demonstrate the concept of interpolation.
	C217A.4	Compute numerical integration by Trapezoidal and Simpon's rule
	C217A.5	Discuss the key concepts of statistical analysis and regression analysis.
	C217A.6	Introduce computer programming to different numerical methods.
Semester IV: Planning for Sustainable Development C217B [Theory]	C217B.1	Discuss the concept of sustainable development, environmental degradation and poverty
	C217B.2	Outline the strategies for promoting sustainable development
	C217B.3	Identify the ethical responsibility responsibilities, towards present and future generations
	C217B.4	Comprehend the carrying capacity of ecosystems, in order to provide services to humankind
	C217B.5	Compile the knowledge of global trends that impact the life quality of present and future generations
Semester IV: Product Design Engineering C218 BTID405 [Theory]	C218.1	Identify the advanced product in civil engineering
	C218.2	Apply knowledge of basic sciences, mathematics and engineering drawing for problem solving
	C218.3	Design components or a system as whole
	C218.4	Create design documents
	C218.5	Prepare detailed drawings
Semester IV: Engineering Management C219 BTCVC406 [Theory]	C219.1	Demonstrate the nuances of management functions.
	C219.2	Analyze the framework of a business organization.
	C219.3	Adopt an empirical approach toward business situations.
	C219.4	Apply various Managementtechniques.

Semester IV: Basic Human Rights C220 BTHM3401 [Theory]	C220.1	Discuss the history of human rights
	C220.2	Respect all castes, religions and cultures
	C220.3	Discuss the right of Indian citizens
	C220.4	Identify importance of groups and communities in society
	C220.5	Realize the philosophical and cultural basis and historical perspective of human rights
	C220.6	Identify and exhibit responsibilities towards nation
Semester IV: Hydraulics - II C221 BTCVL407 [Laboratory]	C221.1	Demonstrate various fluid measurement techniques
	C221.2	Calibrate various flow measuring devices
	C221.3	Demonstrate hydraulic jump
	C221.4	Demonstrate various jets & pumps
Semester IV: Surveying - II C222 BTCVL408 [Laboratory]	C222.1	Prepare contour map.
	C222.2	Compute the tachometric constants.
	C222.3	Design Simple circular curve by different methods.
	C222.4	Use advanced equipments for surveying

Semester IV: Mechanics of Solids C223 BTCVL409 [Laboratory]	C223.1	Discuss the mechanical properties of materials
	C223.2	Discuss the different theories of failure for brittle and ductile materials
	C223.3	Evaluate strength of various materials
Semester IV: Mini Project C224 BTCVM410 [Laboratory]	C224.1	Apply the Knowledge of product development.
	C224.2	Identify vital needs of the community around
	C224.3	Analyze current practices in civil engineering and design new alternatives
Semester IV: Seminar - Superstructure C225 BTCVF411 [Laboratory]	C225.1	Collect and compile all necessary information of execution work of superstructure construction of building
	C225.2	Outline construction machinery and tools used on site for superstructure construction
	C225.3	Identify and Discuss construction of components of superstructure and their chronological order
	C225.4	Prepare a report and present it, to impart writing and communication skills.

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Semester V: Design of Steel Structures C301 BTCVC 501 [Theory]	C301.1	Use various Design Philosophies for steel Structures and Identify mechanical properties of steel.
	C301.2	Summaries the fundamental mechanics of steel structures and the empirical assumptions made in the analysis of basic steel structural members (i.e. compression, tension and bending).
	C301.3	Apply fundamental mechanics to steel structural members to find member strength (i.e. compression, tension and bending) using working stress.
	C301.4	Apply fundamental mechanics to design steel structural members (i.e. tie, strut, beam, slab, footing, column) using working stress
	C301.5	Apply codal provisions in the analysis and design of various steel structural members.
Semester V: Structural Mechanics -II C302 BTCVC 502 [Theory]	C302.1	Apply the concept of stain energy in the structural analysis of indeterminate structures
	C302.2	Analyze the indeterminate structures subjected to various loading conditions
	C302.3	Evaluate response of structures by classical, iterative and matrix methods
	C302.4	Prepare Influence line diagrams for analysis of determinate and indeterminate structures
	C302.5	Introduction to analysis by discretization techniques such as finite difference method and finite element method
Semester V: Soil Mechanics C303 BTCVC 503 [Theory]	C303.1	Identify different soil properties
	C303.2	compute stresses,permeability and seepage in soil
	C303.3	Compute the earth pressure on retaining wall
	C303.4	Analyze the behavior of soil under shear
	C303.5	Analyze the properties regarding compressibility of soil
Semester V: Environmental Engineering C304 BTCVC 504 [Theory]	C304.1	Analyze water quantity and Quality for treatment
	C304.2	Select water treatment processes.
	C304.3	Design water treatment plant.
	C304.4	Discuss wastewater treatment methods.
	C304.5	Apply solid waste management systems.
	C304.6	Identify sources and effects of air pollution.
Semester V: Transportation Engineering C305 BTCVC 505 [Theory]	C305.1	Recognize the scope of transportation Engineering and identify lacuna in present scenario
	C305.2	Analyze geometrical features of roadway and design various types of pavements using standard code and practice.
	C305.3	Identify Driver, User, vehicle and Roadwaycharacteristics and Analyze the interaction among the parameters.
	C305.4	Analyze Speed-Volume-Density, traffic surveys. Perform Highway Capacity Analysis and apply Traffic Control measures.
	C305.5	Predict transportation impact and traffic forecasting

Semester V: Materials, Testing and Evaluation C306A BTCVE506A [Elective-Theory]	C306A.1	Apply knowledge of material science to construct strong and durable structures.
	C306A.2	Use knowledge of quality assurance and control to their real life as a professional.
	C306A.3	Select new civil engineering materials.
	C306A.4	Demonstrate different material testing equipments.
Semester V: Essence of Indian Traditional Knowledge C307 BTHM507 [Elective-Theory]	C307.1	Discuss various Indian traditional knowledge sytem
	C307.2	Explain ancient water supply development
	C307.3	Discuss and compare traditional construction material and techniques of ancient structures with new one.
	C307.4	Outline development of transportation systems of India
Semester V: Soil Mechanics C308 BTCVL508 [Laboratory]	C308.1	Determine different engineering properties of soil
	C308.2	Identify and classify soils based on standard geotechnical engineering practices
	C308.3	Perform Laboratory oratory compaction and in place density tests
Semester V: Environmental Engineering C309 BTCVL509 [Laboratory]	C309.1	Select degree of treatment required for water and wastewater.
	C309.2	Evaluate various physical and biological properties of water and wastewater for deciding degree of treatment.
	C309.3	Evaluate various chemical properties of potable water.
Semester V: Transportation Engineering C310 BTCVL510 [Laboratory]	C310.1	Evaluate different engineering properties of aggregate and Bitumen.
	C310.2	Perform various tests on different road construction materials.
	C310.3	Perform quality control tests on pavements and pavement materials.
	C310.4	Demonstrate pavement materials.
	C310.5	Analyze properties of soil for different types of pavements.

Semester V: Seminar C311 BTCVS511 [Laboratory]	C311.1	Identify Construction material and its use on site
	C311.2	Identify and demonstrate process of electrification, plumbing and air conditioning
	C311.3	Apply technical knowledge for construction of sound building

Semester VI: Design of Concrete Structures - I C312 BTCVC601 [Theory]	C312.1	Understand the characteristic strength of materials and loads used in the design reinforced concrete structures
	C312.2	Recognize the various assumptions and methodologies used in the design of reinforced concrete elements
	C312.3	Know the analysis and design steps for substructure and superstructure reinforced concrete elements
	C312.4	Verify the strength, serviceability and stability of reinforced concrete structures for various load combinations in accordance with code requirements
	C312.5	Ability to provide detailing of reinforcements of various reinforced concrete components
Semester VI: Foundation Engineering C313 BTCVC602 [Theory]	C313.1	Know about soil exploration and nature of soil
	C313.2	Calculate the bearing capacity of soils and foundation settlements
	C313.3	Identify reasons behind the failure of foundation
	C313.4	Analyze and design various types of foundations
	C313.5	Interpret the importance of earth pressure diagram in design of sheet piles
Semester VI: Concrete Technology C314 BTCVC603 [Theory]	C314.1.1	Study of concrete & its Properties
	C314..2	Study & Determine various properties of cement & its impact on concrete
	C314.3	Study & determine the properties of aggregate & its impact on concrete
	C314.4	Design of concrete mix
	C314.5	Study of special concrete & Admixture, its use & application
Semester VI: Project Management C315 BTCVC604 [Theory]	C315.1	Discuss various steps in project management.
	C315.2	Prepare network analysis by using CPM and PERT.
	C315.3	Determine optimum duration of project.
	C315.4	Use concepts of engineering economics.
	C315.5	Discuss total quality management.

Semester VI: Waste Water Treatment C316F BTCVE605F [Theory]	C316F.1	Evaluate the various sewage characteristics.
	C316F.2	Analysis and design of wastewater treatment plants
	C316F.3	Apply treatment technologies for industrial waste water.
	C316F.4	Recognize Concept of recycling of sewage and its disposal.
	C316F.5	Understand and Prepare rural sanitation schemes and solid waste management concepts
Semester VI: Building Planning and Design C317 BTCVC606 [Theory]	C317.1	Students will be able to plan buildings considering various principles of planning and bye laws of governing body.
	C317.2	Students will be able to comprehend various utility requirements in buildings
	C317.3	Students will be able to understand various techniques for good acoustics.
	C317.4	Students will be able to find various requirements for good ventilation.

Semester VI: Concrete Technology [Laboratory] C318 BTCVL607	C318.1	Demonstrate test on concrete ingredient.
	C318.2	Analyze and demonstrate effect of admixture on concrete.
	C318.3	Determine various properties of concrete in fresh and hardened state.
	C318	Design concrete mix for various grades of concrete.
Semester VI: Building Planning, Design and Drawing C319 BTCVL608 [Laboratory]	C319.1	Students will be able to draw plan, elevation and section of load bearing and framed structures.
	C319.2	Students will be able to draw plan, elevation and section of public structures.
	C319.3	Students will be able to draw working drawings for all structures.
Semester VI: Community Project [Mini Project] C320 BTCVM609 [Laboratory]	C320.1	Summaries Current problem/ challenge of the world as a community
	C320.2	Acquire needed depth of the knowledge in the field of the mini project topic
	C320.3	Propose solution to the current problem/ challenge of the community
	C320.4	Prepare report based on the study
Semester VI: Seminar – Road Construction C321 BTCVS610 [Laboratory]	C321.1	Demonstrate knowledge about highway construction from field visit
	C321.2	Demonstrate knowledge for works of execution of highway pavements
	C321.3	Explain sequential order of preparation of road alignment , various surveys and execution of road works
	C321.4	Prepare technical reports and deliver presentation
Semester VI: Industrial Training C322 BTCVF611 [Laboratory]	C322.1	Study and understand the practical work on construction site
	C322.2	Study the various constriction material, construction procedure and activities with respect to Man, Material, Machinery, Money and Minutes
	C322.3	Study the Initiation , planning, execution, monitoring and closeout of projects
	C322.4	Study the quality of various material
	C322.5	Prepare the Industrial training report with specific contribution of work

Class: Final B. Tech [Civil Engineering]

Semester VII: Design of Concrete Structures – II C401 BTCVC 701 [Theory]	C401.1	Analyze and design of concrete section under torsion
	C401.2	Analyze and design compression member
	C401.3	Apply the theory of Pre-stressed concrete to calculate forces, moments and stresses in structural members, subjected to different loading conditions.
Semester VII: Infrastructure Engineering C402 BTCVC 702 [Theory]	C402.1	Understand design of various components of railway engineering
	C402.2	Understand the types and functions of tracks, junctions and railway stations.
	C402.3	Know about the aircraft characteristics, planning and components of airport
	C402.4	Understand the types and components of docks and harbors.
	C402.5	Understand the types and components of bridge.
	C402.6	Understand the types and components of Tunnel.
Semester VII: Water Resources Engineering C403 BTCVC 703 [Theory]	C403.1	understand the need of Irrigation in India and water requirement as per farming
	C403.2	Discuss Reservoirs, spillways, Gates and Energy dissipaters
	C403.3	Design canal and weir by different theories
	C403.4	understand various irrigation structures and Schemes
	C403.5	Develop basis for design of irrigation scheme.
Semester VII: Professional Practices C404 BTCVC 704 [Theory]	C404.1	Create approximate and detailed estimate
	C404.2	Prepare detailed specification and rate analysis
	C404.3	Discuss and draft tenders and contract documents
	C404.4	Carryout valuation of buildings
Semester VII: Construction Techniques C405A BTCVE705A [Theory]	C405A.1	Understand the planning of new project with site accessibility and services required.
	C405A.2	Comprehend the various civil construction equipment's.
	C405A.3	Familiar with layout of RMC plant, production, capacity and operation process.
	C405A.4	Recognize various aspect of road construction, construction of diaphragm walls, railway track construction.
Semester VII: Introduction to Earthquake Engineering C406D BTCVE706D [Theory]	C406D.1	Apply the basics of structural dynamics in analysis of structures subjected to earthquakes.
	C406D.2	Understand plate tectonics, ground motion characteristics,magnitude intensity, and frequency of an earthquake.
	C406D.3	compute earthquake hazard and design response spectra
	C406D.4	Apply building code for earthquake requirements in design of structural systems.

Semester VII: Design & Drawing of RC & steel Structures C408 BTCVL708 [Laboratory]	C407.1	Review the available literature and formulate the methodology for the chosen design
	C407.2	Analyze the structure using modern tools applying the theoretical principles
	C407.3	Design the structural elements pertaining to the design problem as per the codal provisions
	C407.4	Conclude with a optimum design for the structure as a whole
	C407.5	Prepare a detailed report and make presentation on the same
Semester VII: Professional Practices C408 BTCVL708 [Laboratory]	C408.1	Create approximate and detailed estimate
	C408.2	Prepare detailed specification and rate analysis
	C408.3	Discuss and draft tenders and contract documents
	C408.4	Carryout valuation of buildings
Semester VII: Training C409 BTCVT709 [Laboratory]	C409.1	Demonstrated ethical behavior during the internship
	C409.2	Demonstrated ability to work effectively as an individual and as a team member.
	C409.3	Demonstrated effective communication (Oral & written)
	C409.4	Demonstrated managerial skills
	C409.5	Demonstrated ability of independent learning.
Semester VII: Seminar C410 BTCVS710 [Laboratory]	C410.1	Showcase recent trends in Civil Engineering practices
	C410.2	State of review of technical research findings
	C410.3	Present Comprehensive seminar based on literature survey and case studies
	C410.4	Prepare technical report on findings of literature survey and case studies
Semester VII: Project Stage-I C411 BTCVP711 [Laboratory]	C411.1	Develop the knowledge and skills essential to plan, analyze and design infrastructure projects using a wide range of current engineering tools and procedures.
	C411.2	Review and evaluate the available literature on the chosen problem.
	C411.3	Formulate the methodology to solve the identified problem.
	C411.4	Prepare and present the outcome of the project.
	C411.5	Improve your abilities as a leader and as a team player so that you can have a long and prosperous career as a civil engineer.
Semester VIII: Maintenance and Repair of Concrete Structures C412D BTCVSS801D	C412D.1	Significance and fundamentals of corrosion
	C412D.2	Carbonation-induced and chloride-induced corrosion
	C412D.3	Corrosion of embedded metal; Types of reinforcement
	C412D.4	Ring Test For Assessing The Quality of TMT
Semester VIII: Soil Structure Interaction BTCESS802E C413E [Theory]	C412E.1	Determination of Bearing capacity of soil
	C413E.2	Analysis and Design of Shallow Foundation
	C413E.3	Analysis and Design of Elastic Foundation
	C413E.4	Analysis and Design of Pile Foundation

Semester VIII: Project Stage-II BTCEP803 C414 [Laboratory] AY 2022-2023	C414.1	Identify real life problem and review available literature to formulate the methodology.
	C414.2	Analyze and evaluate the system/product/process designed, using modern tools.
	C414.3	Interpret the data/findings for arriving at valid conclusions.
	C414.4	Prepare and present the outcome of the project, following engineering ethics.
	C414.5	Demonstrate abilities as a leader and a team member.