# Course Outcomes (CO) – Engineering Mechanics (BTES203)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Engineering Mechanics. Specific courses may emphasize certain outcomes or focus on particular aspects of Engineering Mechanics based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Determine resultant of various force systems. |
| **CO2** | To be able to draw the free body diagrams of mechanical components and systems. |
| **CO3** | Determine centroid, moment of inertia. |
| **CO4** | Determine reactions of beams, calculate forces in trusses using principles of equilibrium |
| **CO5** | Calculate position, velocity and acceleration of particle using principles of kinematics. |
| **CO6** | Calculate position, velocity and acceleration of particle using principles of kinetics and Work, Power, Energy. |

# Course Outcomes (CO) – Basic Civil Engineering (BTES106)

**Course Description:**

The design, construction, and maintenance of the built environment, including public works like roads, bridges, canals, dams, airports, sewage systems, pipelines, building structural elements, fall under the broad category of Basic civil Engineering.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Understand basic different types of curve on the road and their Pre. survey |
| **CO2** | Perform setting of curves, buildings, culverts, tunnels etc |
| **CO3** | Comprehend different geodetic methods of surveying such as triangulation, trigonometric levelling |
| **CO4** | Comprehend modern advance surveying techniques |
| **CO5** | Students are able to calculate compute the area and earthwork for different works by using surveying instruments |
| **CO6** | Students are able to do the surveying of different civil engineering projects |

# Course Outcomes (CO) – Mathematics – III (BTBSC301)

**Course Description:**

The course is intended to provide understanding of concepts of mathematics and its application to engineering. This course introduces the student to the second and higher order differential equations and their solution, function of a complex variable.This course is aimed study concept of

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Solve engineering problems using the principles of solution of differential equations. |
| **CO2** | Understand analytic function of a complex variable and able to apply Cauchy integral theorem and residue theorem to solve contour integrations. |
| **CO3** | Use Fourier transforms and its inverse in practical applications of electronics engineering. |
| **CO4** | Apply Laplace transform and its inverse to solve initial value and other related problems. |
| **CO5** | Know basic statistical techniques required for electronics engineering. |
| **CO6** | To Under Stand Functions of Complex Variables (Integral calculus) |

# Course Outcomes (CO) – Mechanics of Solid (BTCVC302)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Mechanics of Solid, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Mechanics of Solid based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Describe the mechanical behaviour of engineering materials subjected to various types of stresses and compute the resulting strain and strain energy. |
| **CO2** | Analyse the bending of various types of beams under static loading conditions and compute the shear stress distribution for different cross sections of beams. |
| **CO3** | Show knowledge of principal planes, stresses and strains and analyse the elastic deformation of members and apply different theories of elastic failures. |
| **CO4** | Compute the torsion for the circular shaft and analyse the crippling load and equivalent length for various types of columns of different end conditions. |
| **CO5** | Compute the deflection of beams and shafts under static loading and stresses in thin walled cylindrical and spherical vessels. |
| **CO6** | Perform failure analysis |

# Course Outcomes (CO) – Hydraulics-I (BTCVC303)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Hydraulics-I, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Hydraulics-I based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Describe fluid mechanics fundamentals, including concepts of mass and momentum conservation. |
| **CO2** | Apply the Bernoulli equation to solve problems in fluid mechanics. |
| **CO3** | Apply control volume analysis to problems in fluid mechanics. |
| **CO4** | Perform dimensional analysis for problems in fluid mechanics. |
| **CO5** | Explain of laminar and turbulent boundary layer fundamentals with examples. |
| **CO6** | An ability to apply the concepts developed for fluid flow for the design of notches and weirs. |

# Course Outcomes (CO) – Surveying I (BTCVC304)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Surveying I, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Surveying I based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Use the Theodolite along with chain/tape/compass on the field. |
| **CO2** | Applying geometry and trigonometric principals of basic surveying calculations |
| **CO3** | Able to control the accumulation of errors in projects. |
| **CO4** | Apply the knowledge of levelling in different operations in civil engineering projects. |
| **CO5** | Explain Basic surveying instruments and techniques |
| **CO6** | Applying drawing techniques in the development of topographic maps |

# Course Outcomes (CO) - Building Construction (BTCVC305)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in building construction, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of building construction based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Understand the properties, uses, and selection of construction materials, including wood, concrete, steel, masonry, and various finishes. |
| **CO2** | Understand composition of concrete and effect of various parameters affecting strength |
| **CO3** | Learn different construction methods and techniques, including framing, concrete pouring, roofing, and interior finishing. |
| **CO4** | Learn about the structural systems used in building construction, including load-bearing walls, framing systems, and structural analysis. |
| **CO5** | Understand and adhere to safety protocols and practices on construction sites to ensure the well-being of workers and compliance with safety regulations. |
| **CO6** | Develop problem-solving skills to address construction-related challenges and issues that may arise during a project. |

# Course Outcomes (CO) – Engineering Geology (BTCVC306)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Engineering geology, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Engineering geology based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | As a students in the Bachelor of Engineering (Civil Engineering) will undertake courses in geology Such as Rock and mineral. |
| **CO2** | Students are able to understand the different geological structures and their impact on civil engineering structure. |
| **CO3** | Students are able to decide the suitable site selection for civil engineering structures |
| **CO4** | Students are able to know the different geological hazards and its mitigation |
| **CO5** | Students are able to understand the different method of geological exploration |
| **CO6** | Students are able to identify the different rocks and minerals based on their property |

# Course Outcomes (CO) – Soft Skills Development (BTHM303)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Hydraulics-II, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Hydraulics-II based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Develop an ability to interact amicably with others. |
| **CO2** | Develop effective communication skills |
| **CO3** | Develop effective presentation skills. |
| **CO4** | Track their progress and know where they stand and know in advance how they'll be assessed. |

# Course Outcomes (CO) – Hydraulics-II (BTCVC401)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Hydraulics-II, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Hydraulics-II based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Apply differential equation of fluid mechanics. Apply the Boundary layer theory and compute drag and lift forces on submerged bodies. |
| **CO2** | Describe and apply the turbulent flow theory and compute velocity distribution in pipes. |
| **CO3** | Analyze uniform and critical flow in channels. |
| **CO4** | Investigate Gradually varied flow and assess hydraulic jump. |
| **CO5** | Describe impact of jet. |
| **CO6** | Describe working principles of pump and hydraulic turbine and demonstrate their characteristic curves. |

# Course Outcomes (CO) – Surveying II (BTCVC402)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Surveying II, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Surveying II based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Understand basic different types of curve on the road and their Pre. survey |
| **CO2** | Perform setting of curves, buildings, culverts, tunnels etc |
| **CO3** | Comprehend different geodetic methods of surveying such as triangulation, trigonometric levelling |
| **CO4** | Comprehend modern advance surveying techniques |
| **CO5** | Students are able to calculate compute the area and earthwork for different works by using surveying instruments |
| **CO6** | Students are able to do the surveying of different civil engineering projects |

# Course Outcomes (CO) – Structural Mechanics-I (BTCVC403)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in structural mechanics-I, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of structural mechanics -I based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Describe the concept of structural analysis, degree of indeterminacy. |
| **CO2** | Calculate slopes and deflection at various locations for different types of beams. |
| **CO3** | Identify determinate and indeterminate trusses and calculate forces in the members of trusses. |
| **CO4** | Perform the distribution of the moments the in continuous beam and frame. |

# Course Outcomes (CO) – Product Design Engineering (BTID405)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Product Design Engineering, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Product Design based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Create simple design of components or a system as a whole |
| **CO2** | Create design documents for knowledge sharing |
| **CO3** | Manage own work to meet design requirements |
| **CO4** | Work effectively in a team |
| **CO5** | Have basic knowledge of software such as Autodesk Fusion 360 or similar freeware |
| **CO6** | To understand Product design and Product marketing and specification |

# Course Outcomes (CO) – Basic Human Rights (BTHM3401)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Basic Human Right, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Basic Human Right based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Develop a comprehensive understanding of the international and national legal frameworks that govern human rights, including treaties, conventions, and constitutional provisions. |
| **CO2** | Identify and describe the core universal human rights principles, such as the right to life, liberty, equality, and freedom from discrimination. |
| **CO3** | Understand the historical development and evolution of human rights, including key historical events and figures that have shaped the human rights movement. |
| **CO4** | Develop the ability to analyze and critically evaluate human rights cases and issues from legal and ethical perspectives. |
| **CO5** | Acquire skills in researching human rights violations, documenting evidence, and reporting on human rights abuses in a clear and objective manner. |
| **CO6** | Develop a sense of ethical responsibility towards promoting and protecting human rights, both as individuals and as members of society. |

## Course Outcomes (CO) – Numerical Methods in Engineering (BTCVE404A)

**Course Description:**

Find the solution of the first order and second order equation with constant coefficient ¬ Find the summation of series finite difference techniques. Find the solution of ordinary differential equation of first order by Euler, Taylor and Runge-Kutta methods .Derive Least – Squares curve fitting procedures, fitting a straight line, nonlinear curve fitting, Curve fitting by a sum of exponentials. Find the derivatives using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formulae, Stirling's interpolation formula, Newton's divided difference formula, Maximum and minimum values of a tabulated function. Derive Trapozoidal rule, Simpson's 1/3 rule, Simpson's 3/8 – rule, and Weddle's rules from General Quadrature formula and find the Euler – Maclaurin Formula of summation and The Euler transformation. ¬ Find the solution of linear systems by using Direct methods, Matrix inversion method, Gaussian elimination methods, Gauss-Jordan Method, Method of factorization, Solution of Tridiagonal Systems.

| | |
|---|---|
| **CO1** | Acquire basic knowledge in solving interpolation with equal interval problems by various numerical methods. Estimate the missing terms through interpolation methods. ¬ |
| **CO2** | Develop skills in analyzing the methods of interpolating a given data, properties of interpolation with unequal intervals and derive conclusions, approximate a function using an appropriate numerical method. |
| **CO3** | Implement numerical methods for a variety of multidisciplinary applications and a variety of numerical algorithms using appropriate technology. |
| **CO4** | Use relevant numerical techniques for interpolation with equal and unequal intervals by using various central difference formulae and code a numerical method in a modern computer language. |
| **CO5** | Apply appropriate numerical methods to solve the problem with most accuracy. ¬ |
| **CO6** | Be able to derive Least – Squares curve fitting procedures, fitting a straight line, fitting a parabola, nonlinear curve fitting, Curve fitting by a sum of exponentials. |

# Course Outcomes (CO) – Design of Steel Structure (CVT501)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Design of Steel Structure, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Design of Steel Structure based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Recall and understand the fundamental of steel structures. |
| **CO2** | Calculate the plastic moment of different cross section and **design** of bolted and welded connections |
| **CO3** | Identify the different failure modes of steel tension and compression members and beams, and compute their design strength |
| **CO4** | Analyze & design the plate and gantry girder |
| **CO5** | Analyze and design of column bases. |
| **CO6** | Analyze and design of composite beams. |

# Course Outcomes (CO) – Structural Mechanics II (CVT502)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in structural mechanics II, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of structural mechanics II based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Analysing indeterminate in jointed trusses. |
| **CO2** | Have basic knowledge of concept of influence line |
| **CO3** | Have the basic understanding of principle and concept related to FEM. |
| **CO4** | Have basic knowledge of direct flexibility method |
| **CO5** | Have basic knowledge of direct stiffness method |
| **CO6** | To understand various types of cable, bridges and arches |

# Course Outcomes (CO) – Geotechnical Engineering (CVT503)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Geotechnical engineering, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Soil Mechanics based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Know the basic principles of soil mechanics, |
| **CO2** | Describe various index / engineering properties of soil and measurements of the same. |
| **CO3** | Predict soil behaviour under the application of loads. |
| **CO4** | Solve problems in practice. |
| **CO5** | Understand stresses in soil and permeability and seepage aspects |
| **CO6** | Develop ability to take up soil design of various foundations |

# Course Outcomes (CO) – Concrete Technology (CVT504)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Concrete Technology, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Concrete Technology based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Understand concepts related to concrete technology which involves types and property of concrete and different materials. |
| **CO2** | Describe the properties and factors influencing the workability of fresh concrete. |
| **CO3** | Analyze the behaviour of fresh and hardened concrete by understanding composition of various types of concrete and various tests performed on concrete. |
| **CO4** | Analyze the need for special concretes by involving basic chemistry of fly ash, plasticizer, retarder, etc and its application at various situations. |
| **CO5** | Understand the basic difference between the conventional and non-destructive testing of concrete and its applications |
| **CO6** | To understand various types of properties of ingredient of concrete |

# Course Outcomes (CO) – Transportation Engineering (BTCVC505)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Transportation Engineering, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Transportation Engineering based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Comprehend various types of transportation systems and their history of the development |
| **CO2** | Comprehend to various types of pavements |
| **CO3** | Understand the principle involved in traffic engineering for the design of signal, parking and pedestrian facilities. |
| **CO4** | Design the pavements by considering various aspects associated with traffic safety measures. |
| **CO5** | Understand road safety and accidents studies involved |
| **CO6** | Introduction to other modes of Transportation |

# Course Outcomes (CO) – Town and Urban Planning (CVE6-603)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Town and urban planning, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Town and urban planning based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Understand Town and urban planning and their essential attributes. |
| **CO2** | Understand the history of town planning i.e., Indus valley civilization, Vedic period, Buddhist period, Mughal period, British period and post-independence period. |
| **CO3** | Understand about various town planners and their works. |
| **CO4** | Understand various planning methods. |
| **CO5** | Identify elements of planning's and regulation of the same |
| **CO6** | Implement guidelines provided by standard authorities i.e. MRTP ACT |

# Course Outcomes (CO) – Design of Concrete Structure-I (CV 601)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Design of Concrete Structure-I. Specific courses may emphasize certain outcomes or focus on particular aspects of Design of Concrete Structure-I based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | To explain the basic design philosophy behind the Working Stress method, limit state method |
| **CO2** | Analyze and design of singly and doubly reinforced section |
| **CO3** | Analyze and design of flange section |
| **CO4** | Analyze and design of shear and bond |
| **CO5** | Analyze and design of slab |
| **CO6** | Analyze and design of staircase |

# Course Outcomes (CO) – Foundation Engineering (CV 604)

**Course Description:**

In this course students are guided to apply the theory learnt in Foundation Engineering to the practical applications. They are introduced to the topics of bearing capacity of shallow foundations, deep foundations, etc. They are required to determine the relevant parameters necessary for prediction of bearing capacity, foundation design, design of pile foundations etc

| | |
|---|---|
| **CO1** | Decide type of soil investigation methods needed before commencement of the construction. |
| **CO2** | Estimate bearing capacity of soil. |
| **CO3** | Predict soil behaviour under the application of loads and come up with appropriate solutions to foundation design queries. |
| **CO4** | To predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries. |
| **CO5** | Analyze the stability of slope by theoretical and graphical methods. |
| **CO6** | Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters. |

# Course Outcomes (CO) – Building Planning and Design (CV605)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Building Design and Drawing. Specific courses may emphasize certain outcomes or focus on particular aspects of Building Design and Drawing based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Learn building components, principles, methods, software's and codes of practices for planning and design of the building. |
| **CO2** | Apply knowledge of various building components and services to design and construction of buildings. |
| **CO3** | Prepare constructional detailed representation drawing of a building. |
| **CO4** | Analyze the planning laws and recommendations involved in planning, building drawings and architectural concepts of buildings |
| **CO5** | Design plans of different types of building components and to understand the drawing principles involved in the design. |
| **CO6** | Understand Various techniques for good acoustics |

# Course Outcomes (CO) – Project Management (CVE6-601)

**Course Description:**

Project management theory, terms and concepts are introduced in this course. Students will discover the project life cycle and learn how to build a successful project from pre-implementation to completion. It will introduce project management topics such as resources, costs, time constraints and project scopes. students will identify the resources needed for each stage, including involved stakeholders, tools and supplementary materials.Students will be able to provide internal stakeholders with information regarding project costs by considering factors such as estimated cost, variances and profits.

| | |
|---|---|
| **CO1** | Understand various steps in project management different types of charts. Construct network by using CPM and PERT method. |
| **CO2** | Determine the optimum duration of project with the help of various time estimates. |
| **CO3** | Know the concept of engineering economics, economic comparisons, and linear break even analysis problems. |
| **CO4** | Understand the concept of total quality Management including Juran and Deming's philosophy. |

# Course Outcomes (CO) – Bridge Engineering (BTCVPE705I)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Bridge Engineering, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of building construction based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Understand components of bridges and its various types. |
| **CO2** | Understand site selection criteria and comprehend various forces acting on bridges. |
| **CO3** | Analyse bridge structures using different analysis techniques. |
| **CO4** | Understand the importance of different types of bridge bearings. |
| **C05** | Understand the design of bridges and it's suitability in construction |
| **C06** | Study the Substructure and superstructure of Bridges in detail |

# Course Outcomes (CO) – Professional Practice (BTCVC704

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Professional Practice, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Professional Practice based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Prepare quantity estimates for Buildings, roads & rails and canal structures as per specifications. |
| **CO2** | Draft detailed specifications and work out Rate Analysis for all works related to civil engineering projects |
| **CO3** | Ascertain the quantity of materials required for Civil engineering works as per specifications.. |
| **CO4** | Prepare cost estimate and valuation of civil engineering works |
| **CO5** | Prepare tenders & contract documents. Evaluate contracts and tenders in construction practice |
| **CO6** | Will able to value a property, price escalation recommendations. |

# Course Outcomes (CO) – Infrastructure Engineering (BTCVC702)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Infrastructure Engineering, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Infrastructure Engineering based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | To Know about the basics and design of various components of railway engineering |
| **CO2** | To Understand the types and functions of tracks, junctions and railway stations. |
| **CO3** | To Classify bridges and assess their suitability. |
| **CO4** | To Describe methods of construction of various types of bridges, testing and maintenance of bridges. |
| **CO5** | To Explain operating principles and technical terms related to airport engineering, airport planning. |
| **CO6** | To Understand the types and components of docks and harbors. |

# Course Outcomes (CO) – Construction Techniques (BTCVC703)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Infrastructure Engineering, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Infrastructure Engineering based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Understand the planning of new project with site accessibility and services required. |
| **CO2** | Comprehend the various civil construction equipment's |
| **CO3** | Familiar with layout of RMC plant, production, capacity and operation process |
| **CO4** | Recognize various aspect of road construction, construction of diaphragm walls, railway track construction etc. |
| **CO5** | To understand the construction concepts and importance of techniques associated to construction |
| **CO6** | To understand the involvement of both strategic and tactical decisions about appropriate technologies and the best sequencing of operations. |

# Course Outcomes (CO) – Introduction to Earthquake Engineering (BTCVOE706D)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Earthquake Engineering, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Earthquake Engineering based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Capture complexities in earthquake resistant design of structures |
| **CO2** | Grasp Nature of earthquake vibration and associated forces on structures |
| **CO3** | Understand importance of designing the building to targeted seismic performance. |
| **CO4** | To understand the concept of earthquake impact on the environment |
| **CO5** | To study Principles of Earthquake Resistant Design (EQRD) and planning aspects |
| **CO6** | To understand the construction aspects of masonry and timber structures |

# Course Outcomes (CO) – Design of Reinforced and Prestressed Concrete (BTCVC701)

**Course Description:**

These course outcomes are intended to provide students with a well-rounded education in Design of Reinforced and Prestressed Concrete, covering both theoretical knowledge and practical skills needed for a successful career in the field. Specific courses may emphasize certain outcomes or focus on particular aspects of Design of Reinforced and Prestressed Concrete based on their curriculum and goals.

At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Design of axial load , uniaxial bending and biaxial bending in column |
| **CO2** | Design for torsion |
| **CO3** | Understand the reason for use of high strength concrete and steel, systems of prestressng and methods of prestressing |
| **CO4** | Analysis of stresses. |
| **CO5** | Analysis of losses in prestressed. |
| **CO6** | Design of rectangular and symmetrical flange section |