## B TECH - I YEAR I SEM

### C101  Course Name: Mathematics I

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<td>CO4</td>
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<tr>
<td>CO5</td>
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**CO1**
Write the matrix representation of system of linear equations and identify the consistency of the system of equations.

**CO2**
Find the Eigen values and Eigen vectors of the matrix and discuss the nature of the quadratic form.

**CO3**
Analyze the convergence of sequence and series.

**CO4**
Discuss the applications of mean value theorems to the mathematical problems, Evaluation of improper integrals using Beta and Gamma functions.

**CO5**
Examine the extrema of functions of two variables with/ without constraints.

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### C102  Course Name: ENGINEERING PHYSICS

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<td>CO4</td>
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<tr>
<td>CO5</td>
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**CO1**
Explain the crystal structure of solids

**CO2**
Understand various optical phenomena of matter

**CO3**
Explain the working principle of optical fibers and lasers

**CO4**
Interpret forced damped harmonic oscillations

**CO5**
Apply the knowledge of magnetic behavior of materials

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### C103  Course Name: PHYSICS LAB

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<tr>
<td>CO4</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>4</td>
</tr>
</tbody>
</table>

**CO1**
Apply optical phenomena to characterize optical sources and components.

**CO2**
Characterize semiconductors and semiconductor devices.

**CO3**
Study transient response of RC circuit.

**CO4**
Study the properties and resonance mechanisms in mechanical and electrical systems.

**CO5**
Evaluate the magnetic Induction along the axis of current carrying coil.

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### C104  Course Name: English

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<tr>
<td>CO2</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>2</td>
</tr>
</tbody>
</table>

**CO1**
Infer the importance of scientific discoveries in promoting social responsibilities.

**CO2**
Comprehend the given texts and respond appropriately for technical and professional purposes.

**CO3**
Communicate confidently and transfer information into various forms
### R21 Course Outcomes

<table>
<thead>
<tr>
<th>CO4</th>
<th>Understand the importance of health and nutrition for a better society.</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO5</td>
<td>Present various forms of business writing skills for successful careers.</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>C105</th>
<th>Course Name: English Language Skills Lab (ELSL)</th>
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<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Reproduce speech sounds and improve fluency in language.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand syllables and consonant clusters for appropriate pronunciation.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Exhibit effective professional skills with rhetoric eloquence.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Deliver enthusiastic and well-practiced presentation.</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>Learn Task-Based Language Learning (TBLL) through various language learning activities effectively.</td>
<td>2</td>
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<table>
<thead>
<tr>
<th>C106</th>
<th>Course Name: Programming for Problem Solving – I</th>
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<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Design Algorithms and Flowcharts for real world applications using ‘C’.</td>
<td>6</td>
</tr>
<tr>
<td>CO2</td>
<td>Know the usage of various operators in Program development.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Design programs involving decision and iteration structures.</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>Apply the concepts code reusability using Functions.</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyze various searching and sorting techniques using Arrays.</td>
<td>4</td>
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</table>

<table>
<thead>
<tr>
<th>C107</th>
<th>Course Name: Programming for Problem Solving Lab – I</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Apply the specification of syntax rules for numerical constants and variables, data types.</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Know the Usage of various operators and other C constructs.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Design programs on decision and control constructs.</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>Develop programs on code reusability using functions.</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>Implement various searching and sorting techniques using arrays.</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C108</th>
<th>Course Name: ENGINEERING GRAPHICS &amp; MODELING</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand the concepts of engineering drawing of planes, solids and the CAD drawing software.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Applying the principles of engineering graphics while drawing the engineering components.</td>
<td>6</td>
</tr>
<tr>
<td>CO3</td>
<td>Analyse the sectional views for their configurations.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Evaluate the surfaces of solids developed for further processing in the engineering applications.</td>
<td>5</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

**B TECH - I YEAR II SEM**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: Mathematics – II</th>
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<tbody>
<tr>
<td>C131</td>
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</tr>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Classify the various types of differential equations of first order and first degree and apply the concepts of differential equations to the real-world problems.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Solve higher order differential equations and apply the concepts of differential equations to the real-world problems.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Find the Laplace Transform of various functions and apply to find the solutions of differential equations.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Evaluate the multiple integrals and identify the vector differential operators physically in engineering problems.</td>
<td>5</td>
</tr>
<tr>
<td>CO5</td>
<td>Evaluate the line, surface and volume integrals and converting them from one to another by using vector integral theorems.</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: CHEMISTRY</th>
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</thead>
<tbody>
<tr>
<td>C132</td>
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<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Acquire knowledge of atomic, molecular and electronic changes related to conductivity.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the various processes of treatment of water for both domestic and industrial purpose.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Apply the knowledge of electrode potentials for the protection of metals from corrosion.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyze the major chemical reactions that are used in the synthesis of compounds.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Apply the knowledge of polymers in every day’s life.</td>
<td>3</td>
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</table>

<table>
<thead>
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<th>Course Code</th>
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<tr>
<td>C133</td>
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<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Determination of parameters like hardness, alkalinity and chloride content in water.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Estimation of rate constant of a reaction from concentration-time relationships.</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Determination of physical properties like adsorption, surface tension and viscosity.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Synthesize a small drug molecule and analyze a salt sample.</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Calculation of strength of compound using instrumentation techniques.</td>
<td>2</td>
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</table>
## R21 Course Outcomes

### C134  
**Course Name:** Engineering Mechanics  
**Bloom’s Taxonomy**

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<th>CO</th>
<th>Students who successfully complete this course will be able to:</th>
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<tbody>
<tr>
<td>CO1</td>
<td>Understanding the concepts of engineering mechanics</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the laws of mechanics for various engineering applications</td>
</tr>
<tr>
<td>CO3</td>
<td>Analyze the motion of body.</td>
</tr>
<tr>
<td>CO4</td>
<td>Evaluate performance of various engineering components in terms of their energy capacities</td>
</tr>
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<td><strong>Bloom’s Taxonomy</strong></td>
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### C135  
**Course Name:** ENGINEERING WORKSHOP  
**Bloom’s Taxonomy**

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<th>CO</th>
<th>Students who successfully complete this course will be able to:</th>
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<tbody>
<tr>
<td>CO1</td>
<td>Understanding the tools and methods of using to fabricate engineering components</td>
</tr>
<tr>
<td>CO2</td>
<td>Applying the measuring techniques to verify the dimensional accuracy</td>
</tr>
<tr>
<td>CO3</td>
<td>Evaluating various methods and trades of workshop in the component building</td>
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<td><strong>Bloom’s Taxonomy</strong></td>
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### C136  
**Course Name:** English Communication Skills Lab (ECSL)  
**Bloom’s Taxonomy**

<table>
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<th>CO</th>
<th>Students who successfully complete this course will be able to:</th>
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<tbody>
<tr>
<td>CO1</td>
<td>Understand the variants in pronunciation.</td>
</tr>
<tr>
<td>CO2</td>
<td>Identify the diverse purposes of listening and speaking.</td>
</tr>
<tr>
<td>CO3</td>
<td>Discuss ideas in diverse communicative settings.</td>
</tr>
<tr>
<td>CO4</td>
<td>Exhibit increased confidence in public speaking.</td>
</tr>
<tr>
<td>CO5</td>
<td>Display critical thinking, problem solving and decision making skills through GD’s.</td>
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<td><strong>Bloom’s Taxonomy</strong></td>
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### C137  
**Course Name:** Programming for Problem Solving - II  
**Bloom’s Taxonomy**

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<th>CO</th>
<th>Students who successfully complete this course will be able to:</th>
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<tbody>
<tr>
<td>CO1</td>
<td>Identify various string handling functions in ‘C’.</td>
</tr>
<tr>
<td>CO2</td>
<td>Develop programs with user defined data types.</td>
</tr>
<tr>
<td>CO3</td>
<td>Use Dynamic memory allocation functions with pointers.</td>
</tr>
<tr>
<td>CO4</td>
<td>Distinguish between Stacks and Queues.</td>
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<tr>
<td>CO5</td>
<td>Analyze various Dynamic Data Structures.</td>
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<td><strong>Bloom’s Taxonomy</strong></td>
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### C138  
**Course Name:** Programming for Problem Solving Lab- II  
**Bloom’s Taxonomy**

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<th>CO</th>
<th>Students who successfully complete this course will be able to:</th>
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<tbody>
<tr>
<td>CO1</td>
<td>Build programs on various string handling functions.</td>
</tr>
<tr>
<td>CO2</td>
<td>Develop applications on user defined data types.</td>
</tr>
<tr>
<td>CO3</td>
<td>Apply dynamic memory allocation through pointers.</td>
</tr>
<tr>
<td>CO4</td>
<td>Implement linear data structures through stacks and queues.</td>
</tr>
<tr>
<td>CO5</td>
<td>Create linked list dynamically through stacks and queues</td>
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### R21 Course Outcomes

**B TECH – II YEAR I SEM**

<table>
<thead>
<tr>
<th>C201</th>
<th>Course Name: Professional Communication</th>
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<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Acquire enhanced personality</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Exhibit appropriate professional etiquette</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Practice team building with strong communication skills</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Develop problem solving skills and decision-making</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>Demonstrate effective presentation skills</td>
<td>2</td>
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</table>

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<thead>
<tr>
<th>C202</th>
<th>Course Name: Numerical Methods and Partial Differential Equations</th>
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</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
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</tr>
<tr>
<td>CO1</td>
<td>Develop skills in solving engineering problems involving Algebraic and transcendental equations.</td>
<td>6</td>
</tr>
<tr>
<td>CO2</td>
<td>Acquires the knowledge of interpolation in predicting future outcomes based on the present knowledge and also to fit different types of Curves.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Know the various types of numerical methods in solving engineering problems.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Classify the nature of second and Higher order partial differential equations and find the solutions of linear and nonlinear PDE.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Apply Partial differential Equations in different engineering problems.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C203</th>
<th>Course Name: Fluid Mechanics</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand different properties of fluid and the relationship between them.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Explain the Continuity equation for one dimensional, two dimensional and three-dimensional flows.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Apply the Euler’s and Bernoulli’s equations in practical civil engineering problems.</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyze head losses in pipes and flow between parallel plates.</td>
<td>5</td>
</tr>
<tr>
<td>CO5</td>
<td>Demonstrate the boundary layer concepts and its separation.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C204</th>
<th>Course Name: Solid Mechanics -I</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Examine stress – strain, elastic constants and strain energy.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Analyze the shear force and bending moment diagrams of beams and relationship between them.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Evaluate the flexural and shear stresses for various beam cross sections.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Calculate principal stresses and strains using analytical and graphical solutions for the safety using failure theories.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Determine the deflections of beams with various loadings using different methods.</td>
<td>5</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

### C205: Course Name: Engineering Geology

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Classify and compare different rocks and minerals across the construction site.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Identify and build the knowledge on main and most common igneous, sedimentary and metamorphic rocks encountered by foundations and sites.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Define and interpret the geological structures in the geological maps and cross sections</td>
<td>1</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand the importance of graphical studies and various geophysical methods.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Illustrate the factors which affect the dams, reservoirs and tunnels.</td>
<td>4</td>
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</tbody>
</table>

### C206: Course Name: Surveying & Geomatics

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Identify a detailed surveying at any site by any method.</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Ability to use modern survey equipment to measure angles and distances.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Compute the differences in elevation draw and utilize contour plots, volumes for earthwork.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand the working principles of modern equipment and its methodologies.</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyze the basic concept of GPS and its applications.</td>
<td>2</td>
</tr>
</tbody>
</table>

### C207: Course Name: Surveying & Geomatics Lab

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Apply the principle of surveying for civil engineering applications.</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the knowledge to calculate areas, drawing plans and contour maps using different measuring equipment at field level.</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Identify data collection methods and prepare field notes.</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand the working principles of survey instruments, measurement errors and corrective measures</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Interpret survey data and compute areas and volumes, levels by different type of equipment and relate the knowledge to the modern equipment and its methodologies.</td>
<td>1</td>
</tr>
</tbody>
</table>

### C208: Course Name: Engineering Geology Lab

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>To study the physical properties and identification of minerals referred under the theory.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Describe and identify the rocks referred under the theory.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Illustrate the microscopic study of rocks.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Interpret and draw the sections for geological maps showing tilted beds, faults, unconformities etc.,</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Solve the simple structural geological problems.</td>
<td>6</td>
</tr>
</tbody>
</table>
R21 Course Outcomes

<table>
<thead>
<tr>
<th>C209</th>
<th>Course Name: Environmental Science</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Define and explain the structure and functions of ecosystem, value of biodiversity, threats and conservation of biodiversity.</td>
<td>1</td>
</tr>
<tr>
<td>CO2</td>
<td>Explain the limitations of the resources and impacts of over utilization of all natural resources.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Identify the sources and effects of environmental pollutions and list the available techniques to control the pollution.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Illustrate the global environmental issues like climate change, ozone hole and can explain the scope of EIA, Environmental Management Plan, environmental audit and list the EIA methods.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Mention the salient features of environmental acts and rules, define the sustainable goals along with measures required for the sustainability.</td>
<td>2</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

### B TECH - II YEAR IISEM

<table>
<thead>
<tr>
<th>C231</th>
<th>Course Name: Probability and Statistics</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CO1</strong></td>
<td>Differentiate among random variables involved in the probability models which are useful for all branches of engineering.</td>
</tr>
<tr>
<td></td>
<td><strong>CO2</strong></td>
<td>Derive relationship among variety of performance measures using probability distributions.</td>
</tr>
<tr>
<td></td>
<td><strong>CO3</strong></td>
<td>Acquire elementary knowledge of parametric and non parametric –tests and understand the use of observing state analysis for predicting future conditions.</td>
</tr>
<tr>
<td></td>
<td><strong>CO4</strong></td>
<td>Identify and examine situations that generate using problems and able to solve the tests of ANOVA for classified data.</td>
</tr>
<tr>
<td></td>
<td><strong>CO5</strong></td>
<td>Apply proper measurements, Indicators and techniques of Correlation and regression analysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C232</th>
<th>Course Name: Principle of Electrical Engineering</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CO1</strong></td>
<td>Understand basics of electrical circuits, parameters, and operation of the transformers in the energyconversion process, electromechanical energy conversion,</td>
</tr>
<tr>
<td></td>
<td><strong>CO2</strong></td>
<td>Analyze DC machines</td>
</tr>
<tr>
<td></td>
<td><strong>CO3</strong></td>
<td>Use measuring instruments like voltmeter, ammeter, wattmeter for measuring electrical quantities etc.</td>
</tr>
<tr>
<td></td>
<td><strong>CO4</strong></td>
<td>Apply the concepts of electrical engineering to design or analyze basic electrical circuits and machinery.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C233</th>
<th>Course Name: Solid Mechanics-II</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CO1</strong></td>
<td>Design and safety of the shaft subjected to Torsion and bending moment.</td>
</tr>
<tr>
<td></td>
<td><strong>CO2</strong></td>
<td>Calculate the Column capacity for various end conditions due to axial and eccentric loading.</td>
</tr>
<tr>
<td></td>
<td><strong>CO3</strong></td>
<td>Apply the concepts of direct and bending stresses to evaluate the safety of Structures.</td>
</tr>
<tr>
<td></td>
<td><strong>CO4</strong></td>
<td>Evaluate the stresses and strains in thin shells and Thick Cylinders.</td>
</tr>
<tr>
<td></td>
<td><strong>CO5</strong></td>
<td>Determine the stresses due to Unsymmetrical bending of beams and locate the shear Centre.</td>
</tr>
</tbody>
</table>
# R21 Course Outcomes

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name: CONCRETE TECHNOLOGY</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understanding the properties of cements and admixtures.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Analyze the properties of aggregates.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Evaluate the properties of fresh concrete.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyse the behavior of hardened concrete and durability of concrete.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Design the concrete mix using IS Code and describe the special concretes.</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name: Structural Analysis</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Analyze propped cantilever, fixed beams for external loadings and support settlements.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand the concept of Slope deflection, moment distribution method and analysis of continuous beams.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Examine the beams and arches.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyze the pin-jointed plane frames.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Draw the influence line diagram for moving loads.</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name: Building Materials and Construction</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Identify various building materials and to understand their basic properties.</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand the minimum standards required to designate and use the materials in construction.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Discuss type metals and finishes used in the construction process.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand modern materials in general construction practice.</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Recognize the concept of plastering, pointing and various other building services.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name: COMPUTER AIDED DRAFTING LAB</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Assess the Software with aiding source.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Demonstrate the different modes of commands.</td>
<td>6</td>
</tr>
<tr>
<td>CO3</td>
<td>Draft the plan, Elevation &amp; Sectional Views of the building.</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>Develop the components of the building</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Replicate the complete detailing of Building with BIM input.</td>
<td>5</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

<table>
<thead>
<tr>
<th>C238</th>
<th>Course Name: Solid Mechanics Lab</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Demonstrate of materials under impact, hardness, tensile and compressive loads.</td>
<td>6</td>
</tr>
<tr>
<td>CO2</td>
<td>Determine elastic constants by flexural and torsion test.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Illustrate spring constants under various loadings.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand the deflection of materials under bending</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Compute basic material properties stress and strain.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C239</th>
<th>Course Name: Gender Sensitization</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Develop awareness about gender discrimination and take measurable steps to counter it.</td>
<td>5</td>
</tr>
<tr>
<td>CO2</td>
<td>Identify the basic dimensions of biological, sociological, psychological and legal aspects of gender.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Acquire knowledge about gendered division of labour in relation to politics and economics.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>To prepare the students against gender violence.</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>To prepare the students to work and live together as equals.</td>
<td>6</td>
</tr>
</tbody>
</table>
### C301: Managerial Economics and Financial Analysis

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Understand the nature and scope of business economics.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Differentiate various forms of business organization.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Identify the impact of economic variables on the business firms.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyse the demand, supply, production, cost, market structure, pricing aspects.</td>
<td>5</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyse, compare and interpret the financial statement of a company using ratios.</td>
<td>3</td>
</tr>
</tbody>
</table>

### C302: HYDRAULICS & HYDRAULIC MACHINERY

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Determine the Froude number for a given flow to differentiate sub-critical, critical, and super-critical flows.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Compute the non-uniform flow depths for gradually and rapid varied flow.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Apply dimensional analysis to predict physical parameters that influence the flow in fluid mechanics and use dimensionless parameters.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Compute efficiencies of different types of turbines.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Use performance curves to predict performance of centrifugal pumps.</td>
<td>5</td>
</tr>
</tbody>
</table>

### C304: Design of Reinforced Concrete Structures

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Understand the various design concepts and design a beam under flexure and draw the reinforcement details.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Design the beam under shear and torsion, Calculate the anchorage and development length and check the serviceability requirements for RC structural elements.</td>
<td>6</td>
</tr>
<tr>
<td>CO3</td>
<td>Analyze and solve various RC slabs and draw the reinforcement details</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Classify short, long columns and draw the reinforcement details</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Explore the design concept of footing &amp; staircase.</td>
<td>2</td>
</tr>
</tbody>
</table>

### C305: Advanced Structural Analysis (PE1)

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Analyze the continuous beams, portal frames by Kani’s method.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Differentiate Static and kinematic Indeterminacy of Trusses by Castiglione’s second theorem.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Evaluate the shear forces and bending moments in Two-Hinged arches and to execute secondary stresses due to rise of</td>
<td>5</td>
</tr>
</tbody>
</table>
### R21 Course Outcomes

| CO4 | Analyze the Multi-storey frames by approximate methods for gravity (vertical) and horizontal loads. | 4 |
| CO5 | Understand the concept of Matrix method for the analysis of continuous beams and Pin jointed plane frames | 2 |

### C306 | Course Name: Building Planning & Drawing(PE2) | Bloom’s Taxonomy |
| CO | Students who successfully complete this course will be able to: | |
| CO1 | Identify various building components, conventional signs and symbols. | 2 |
| CO2 | Illustrate the building bye-laws and the principles of planning. | 4 |
| CO3 | Understand about the building services and safety. | 2 |
| CO4 | Design and Sketch the plans of various types of buildings and detailing of doors, windows, etc. | 6 |
| CO5 | Understand the elements of perspective drawing involving simple problems. | 2 |

### C307 | Course Name: Air Pollution and Control Methods(PE3) | Bloom’s Taxonomy |
| CO | Students who successfully complete this course will be able to: | |
| CO1 | Find the sources, causes & effects of air pollution. | 2 |
| CO2 | Understand the meteorological components and the plume behavior for atmospheric stability conditions. | 2 |
| CO3 | Identify the types of equipment to control the particulates at sources. | 3 |
| CO4 | Minimize the control measures of NOX, SOX and other gaseous emissions. | 4 |
| CO5 | Demonstrate the factors for siting an industry by examining the air quality standards. | 4 |

### C308 | Course Name: Non Conventional Energy Sources(OE1) | Bloom’s Taxonomy |
| CO | Students who successfully complete this course will be able to: | |
| CO1 | Realize the importance of renewable energy sources for energy planning. | 3 |
| CO2 | Understand the value of solar energy potential and exploit the solar energy for real world applications. | 2 |
| CO3 | Understand the potential of wind energy, types of wind mills, performance characteristics and Betz criteria. | 2 |
| CO4 | Analyze the potential of both tidal and ocean thermal energies and learn the extraction methods. | 4 |
| CO5 | Know the potential of Geothermal, biomass energies and learn relevant extraction methods. | 2 |
## R21 Course Outcomes

<table>
<thead>
<tr>
<th>C309</th>
<th>Course Name: Fundamentals of Electrical Power Generation and Protection (OE1)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand the operation of Thermal power station through its schematic diagram.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand the arrangement of Hydro electric power station through its components.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Understand the various components of Nuclear power station</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand the operation of Gas and Diesel power station through its schematic diagram.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Understand various power system protection components.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C310</th>
<th>Course Name: Elements of Mechanical Engineering</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand the basic concepts of mechanical engineering.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply principles of engineering mechanics in mechanism and machines.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Develop manufacturing methods to produce engineering components.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Evaluate alternative designs for the engineering components</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Select a suitable type of automation applicable for any industry</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C311</th>
<th>Course Name: Product Engineering</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Illustrate creativity and study the techniques of innovation</td>
<td>1</td>
</tr>
<tr>
<td>CO2</td>
<td>Assess the evaluation techniques for screening ideas</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Differentiate the IPR-Patents, Design patents, copyright and trade mark and their laws.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Describe the interaction between design, manufacture, quality and testing</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Establish the machining time in various cutting operations; value engineering; GT and concepts of concurrent engineering.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C312</th>
<th>Course Name: Introduction to Microcontrollers (OE1)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Describe the architecture of 8051 with its special function registers.</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Develop and analyze the programming concepts of 8051</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Understand the various interfacing techniques pertaining to system design.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Express and infer advanced architectures using ARM Controllers.</td>
<td>2</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

<table>
<thead>
<tr>
<th>Course Name: Basic Electronics (OE1)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Name: Basics of Operating Systems (OE1)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Name: Fundamentals of Computer Networks (OE1)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>2</td>
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<tr>
<td>CO4</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Name: Total Quality Management (OE1)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>5</td>
</tr>
<tr>
<td>CO5</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Name: GEOTECHNICAL ENGINEERING LAB</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>5</td>
</tr>
</tbody>
</table>
### R21 Course Outcomes

<table>
<thead>
<tr>
<th>C320</th>
<th>Course Name: FLUID MECHANICS &amp; HYDRAULIC MACHINERY LAB</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Examine the calibration of different flow meters.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Illustrate flow measuring devices used in pipes, channels and notches.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Determine major and minor losses in pipes.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyse the energy equation for problems in pipe flow.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Examine the performance characteristics of turbines and pumps.</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C321</th>
<th>Course Name: PERSONALITY DEVELOPMENT AND BEHAVIOURAL SKILLS</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Practice optimistic attitude for an efficient socially viable and multi-faceted personality.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Demonstrate functions of non-verbal communication in formal context.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Build effective individual &amp; team dynamics for professional accomplishments.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyze appropriate strategic Interpersonal Skills for productive workplace relationships.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Correspond in multiple contexts, for varied audiences, across genres and modalities.</td>
<td>5</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

### B TECH - III YEAR II SEM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: <strong>HIGHWAY ENGINEERING</strong></th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Summarize the road developments in India from different periods.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the concept of geometric design in real time engineering.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Make use of parameters related to traffic studies.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Design &amp; model the intersections with specific standards.</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>Evaluate the different pavement design methods using IRC standards.</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: <strong>Foundation Engineering</strong></th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Organize the preparation and programme of soil investigation.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Examine the earth pressure theories and stability of retaining walls.</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Evaluate the bearing capacity of soil and allowable settlement.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyse the capacity and settlement of pile foundation.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyse the stability of finite and infinite slopes using various methods.</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: <strong>ENVIRONMENTAL ENGINEERING</strong></th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Predict the population by different methods.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Design the filter and settling tanks for water treatment.</td>
<td>6</td>
</tr>
<tr>
<td>CO3</td>
<td>Examine the characteristics of sewage.</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyse and design the sewers for sewerage system.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Design different units of sewage treatment plant.</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: <strong>WATER RESOURCES ENGINEERING</strong></th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Describe the components in the hydrologic cycle and interaction among various processes in the hydrologic cycle</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Analyze the flood and its measurement by means of hydrograph.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Analyze the phenomenon of Ground water occurrence by means of aquifers.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Assess the methods of irrigation and its quality with the help of duty</td>
<td>5</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

<table>
<thead>
<tr>
<th>C335</th>
<th>Course Name: CONSTRUCTION ENGINEERING &amp; MANAGEMENT (PE2)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand the behavioral aspect of entrepreneurs, various approaches of time management, their strength and weakness.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the concepts of project management Techniques.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Analysis various materials and equipments for construction work.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Examine on different types of contracts and specifications.</td>
<td>5</td>
</tr>
<tr>
<td>CO5</td>
<td>Outline the labour regulations and safety in construction.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C336</th>
<th>Course Name: GROUND IMPROVEMENT TECHNIQUES (PE2)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Illustrate the several Ground modification mechanisms</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Illustrate the Ground Improvement Techniques through mechanical approach.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Identify the different Hydraulic ground improvement techniques through dewatering techniques.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Explain the quick settlement techniques through chemical and physical modification.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Distinguish the inclusion and confinement techniques of ground improvement.</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C337</th>
<th>Course Name: FINITE ELEMENT METHOD (PE2)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Explain plane stress-plane strain equations and develop displacement functions.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Analyze one-dimensional problems using stiffness matrix.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Examine the different elements based on continuity and compatibility.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Illustrate quadrilateral elements using nodal points and shape functions.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Discuss the solution techniques for static condition.</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C338</th>
<th>Course Name: PRINCIPLES OF ELECTRIC POWER UTILIZATION (OE2)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO5</td>
<td>Design the canals by using standard theories.</td>
<td>6</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

<table>
<thead>
<tr>
<th>CO</th>
<th>At the end of this course the student will be able to</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Understand terms and concepts of illumination</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the concepts of different electric lamps and good lighting Practices for artificial lighting systems.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Understands the methods of electric heating and welding</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Understands the concepts of different electric traction systems and existing traction system in India.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyze the mechanics of train movement</td>
<td>4</td>
</tr>
</tbody>
</table>

### C339 Course Name: ENERGY AUDITING AND CONSERVATION (OE2)

<table>
<thead>
<tr>
<th>CO</th>
<th>At the end of this course the student will be able to</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Realize the need for energy auditing and conservation. Get awareness on types of energy audit; represent energy flows and energy consumption in tabular and graphical methods.</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand and exploit energy saving opportunities in energy efficient motors and power factor improvement methods.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Learn energy auditing and conservation opportunities in HVAC systems with respect to energy efficient buildings.</td>
<td>1</td>
</tr>
<tr>
<td>CO4</td>
<td>Analyze the economic viability with respect to real world problems using depreciation methods.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Know the check lists for energy conservation in boilers, heat pumps, cooling systems, compressors and fans.</td>
<td>2</td>
</tr>
</tbody>
</table>

### C340 Course Name: MAINTENANCE AND SAFETY ENGINEERING(OE1)

<table>
<thead>
<tr>
<th>CO</th>
<th>At the end of this course the student will be able to</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Understand the need for maintenance in an industry and know about Maintenance Management and Control.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Appreciate and implement various types of maintenance.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Know the concept of inventory control in maintenance.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Evaluate the quality and cost of safety and maintenance.</td>
<td>5</td>
</tr>
<tr>
<td>CO5</td>
<td>Appraise the concepts of reliability and maintainability with reference to the maintenance of equipment.</td>
<td>5</td>
</tr>
</tbody>
</table>

### C341 Course Name: DATABASE MANAGEMENT SYSTEMS (OE2)

<table>
<thead>
<tr>
<th>CO</th>
<th>At the end of this course the student will be able to</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Design Entity-Relationship Model for enterprise level databases.</td>
<td>5</td>
</tr>
<tr>
<td>CO2</td>
<td>Develop the database and provide restricted access to different users of database and formulate the Complex SQL queries.</td>
<td>2</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Name: NUTRITIONAL &amp; BIOLOGICAL CHEMISTRY (OE2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO3</td>
<td>Analyze various Relational Formal Query Languages and various Normal forms to carry out Schema refinement.</td>
</tr>
<tr>
<td>CO4</td>
<td>Use of suitable Indices and Hashing mechanisms for real time implementation.</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyze various concurrency control protocols and working principles of recovery algorithms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C346</th>
<th>Course Name: NUTRITIONAL &amp; BIOLOGICAL CHEMISTRY (OE2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>At the end of this course the student will be able to</td>
</tr>
<tr>
<td>CO1</td>
<td>Understand the importance of nutrients and their effects of deficiency in the diet.</td>
</tr>
<tr>
<td>CO2</td>
<td>Classify the carbohydrates in to mono, di and polysaccharides and their importance.</td>
</tr>
<tr>
<td>CO3</td>
<td>Describe the structure and function of proteins, vitamins and nucleic acids.</td>
</tr>
<tr>
<td>CO4</td>
<td>Interpret the uses and effects of antibiotics and Anti tubercular drugs.</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyse the importance and the negative impacts of using pesticides.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C348</th>
<th>Course Name: ENVIRONMENTAL ENGINEERING LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
</tr>
<tr>
<td>CO1</td>
<td>Understand principles and their practical application in water treatment.</td>
</tr>
<tr>
<td>CO2</td>
<td>Determine physical, chemical and biological characteristics of water and wastewater.</td>
</tr>
<tr>
<td>CO3</td>
<td>Determine the optimum dose of coagulant.</td>
</tr>
<tr>
<td>CO4</td>
<td>Estimate the chloride, nitrate and iron content in water.</td>
</tr>
<tr>
<td>CO5</td>
<td>Summarize the solutions using titration, conductivity meter, pH meter, turbidity meter and DO meter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C349</th>
<th>Course Name: Advanced Communication Skills Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
</tr>
<tr>
<td>CO1</td>
<td>Develop sound communication skills in various situations with the help of enriched vocabulary.</td>
</tr>
<tr>
<td>CO2</td>
<td>Practice reading techniques for a faster and better comprehension.</td>
</tr>
<tr>
<td>CO3</td>
<td>Exhibit strong writing skills to express ideas effectively.</td>
</tr>
<tr>
<td>CO4</td>
<td>Demonstrate effective presentation skills.</td>
</tr>
<tr>
<td>CO5</td>
<td>Use appropriate verbal and non-verbal skills for a successful career.</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

**C350**

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Name: Quantitative Methods &amp; Logical Reasoning</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>To perform well in various competitive exams and placement drives.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>To solve basic and complex mathematical problems in short time.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>To become strong in Quantitative Aptitude and Reasoning which can be applied for GRE, GATE, GMAT or CAT exam also.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>To develop problem solving skills and analytical abilities, which play a great role in corporate and industry set up.</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>To perform well in various competitive exams and placement drives.</td>
<td>4</td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

### B TECH - IV YEAR I SEM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>C401</td>
<td>Course Name: DESIGN OF STEEL STRUCTURES</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Classify the types of connections and specifications as per IS: 800-2007.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the provisions of IS: 800-2007 to design tension members.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Analyze and design compression members.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Illustrate behavior of beams and design strengths as per IS code.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Adapt IS code procedures to design welded plate girder.</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: ESTIMATION &amp; COSTING</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Summarize the basic principles and standard methods for working out quantities in estimating.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Determine the earthwork estimate of buildings, roads and canals.</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Estimate the rate analysis of the various items of work.</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand the process of contracting for roads and buildings.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Evaluate the valuation of buildings and provide practical knowledge of standard specifications of items of building construction.</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: PRESTRESSED CONCRETE STRUCTURES (PE3)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Classify the concepts, principles, types and methods of PSC structures.</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Evaluate the losses of PSC structures.</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Analysis and design of PSC slabs and beams using IS:1343 (2012).</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Explain transmission of prestressing force, end block analysis by different methods.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Analyse the stress distribution of composite beams and assess the deflection of beams. Understand the different methods of prestressing.</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: EARTHQUAKE ENGINEERING (PE3)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Quantify mechanical behaviour of earth’s surface, seismic hazards and its effects.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Identify, formulate and solves engineering problems subjected to</td>
<td>2</td>
</tr>
</tbody>
</table>
### R21 Course Outcomes

| CO3 | Understand the internal parameters of the structures for seismic design source. | 2 |
| CO4 | Assess the design component or process to meet desired needs within realistic constraints. | 5 |
| CO5 | Analyze and design the members for earthquake resisting parameters. | 4 |

<table>
<thead>
<tr>
<th>C405</th>
<th>Course Name: GREEN BUILDING TECHNOLOGIES (PE3)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand the Green building concept and focus on approaches that makes building sustainable.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Illustrate Green building assessment and accreditation system.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Able to apply low energy building strategies.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Design green building to improve sustainability of infrastructure.</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>Classify the economic benefits of green buildings.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C406</th>
<th>Course Name: RAILWAYS, AIRPORTS AND HARBOUR ENGINEERING (PE4)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Define and understand the various components of railways.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand and solve the geometric elements needed for the design of permanent way.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Define, understand, and design the various components of the airport.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Define, understand the planning and requirements of a harbor.</td>
<td>4</td>
</tr>
<tr>
<td>CO5</td>
<td>Improve and Visualize the working of intelligent transportation system.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C407</th>
<th>Course Name: ADVANCED STRUCTURAL DESIGN (PE4)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Analyze and design of cantilever retaining wall.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Apply the provision of IS : 3370-2009 to design water tank.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Compile the design aspects of flat slabs.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Adapt the provision of IRC 21-1987 to class AA loading to design T beam girder.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Summarize the force components and design principles of RCC Chimney.</td>
<td>2</td>
</tr>
</tbody>
</table>
### R21 Course Outcomes

<table>
<thead>
<tr>
<th>C408</th>
<th>Course Name: GROUND WATER HYDROLOGY (PE4)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand different types of aquifers and their characteristics</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Analyse the pumping test data for different aquifers</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Distinguish the surface and subsurface investigation methods of ground water.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Discuss the methods of artificial recharging of ground water.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Explain the control of saline water intrusions.</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C409</th>
<th>Course Name: ELECTRICAL &amp; HYBRID VEHICLES (OE3)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>At the end of the course, the student will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand the components of electric vehicles and fundamentals of electric vehicles.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Summarize the types of batteries and principles of operation of Batteries.</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Perceive the basic principles of electric motors which can be used in electric vehicles</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Restate the transmission of the drive system and the components of the transmission.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Outline the concepts of hybrid vehicles and analyze the performance of hybrid vehicles.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C410</th>
<th>Course Name: ENERGY STORAGE SYSTEMS (OE3)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>At the end of the course, the student will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Perceive the Electrical Energy Storage Technologies.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand the needs of electric energy storage</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Analyze the characteristics and features of energy from various sources.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Classify various types of energy storage and various devices used for the purpose.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Apply the same concepts to real time solutions like electric vehicles, smart Grid and SCADA etc.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C411</th>
<th>Course Name: BASIC AUTOMOBILE ENGINEERING (OE3)</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>At the end of the course, the student will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understanding the basic structure of an automobile.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Evaluating different cooling and lubrication systems of an automobile</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Analyzing the electrical systems in tandem with ignition systems</td>
<td>4</td>
</tr>
</tbody>
</table>
### R21 Course Outcomes

<table>
<thead>
<tr>
<th>Course</th>
<th>Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO4</td>
<td>Understand various transmission and suspension systems.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Appraise steering and braking systems. Understand emission norms of automobiles.</td>
<td>5</td>
</tr>
</tbody>
</table>

### Course Name: MATERIAL SCIENCE AND ENGINEERING (OE3)

<table>
<thead>
<tr>
<th>Course</th>
<th>Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>At the end of the course, the student will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Understand structure of metals and constitution of alloys.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Appraise equilibrium diagrams of various alloys.</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Classify steels, cast irons and their alloys.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Appreciate different heat treatment processes and their influence on properties of metals and alloys. Know different Non-ferrous Metals and Alloys.</td>
<td>5</td>
</tr>
<tr>
<td>CO5</td>
<td>Apply the knowledge of composite and ceramic materials to replace metals and alloys wherever applicable.</td>
<td>3</td>
</tr>
</tbody>
</table>

### Course Name: WEB DESIGN (OE3)

<table>
<thead>
<tr>
<th>Course</th>
<th>Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>At the end of the course, the student will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Create static web pages using HTML</td>
<td>6</td>
</tr>
<tr>
<td>CO2</td>
<td>Design styles for HTML web pages</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Create interactive web pages using Javascript</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>Develop web applications using server side scripting language-PHP</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Develop and analyze web applications with Java Server Pages</td>
<td>4</td>
</tr>
</tbody>
</table>

### Course Name: FUNDAMENTALS OF ENTREPRENEURSHIP (OE3)

<table>
<thead>
<tr>
<th>Course</th>
<th>Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>At the end of the course, the student will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Provide awareness about entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Develop idea generation, creative and innovative skills among students</td>
<td>6</td>
</tr>
<tr>
<td>CO3</td>
<td>Self-motivate the students by making aware of the different opportunities by exploring themselves by discussing the successful growth/failure stories</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Start an enterprise and design business plans are those suitable for funding by considering all dimensions of business.</td>
<td>2</td>
</tr>
</tbody>
</table>

### Course Name: CONCRETE & HIGHWAY MATERIALS LAB

<table>
<thead>
<tr>
<th>Course</th>
<th>Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
</tbody>
</table>
## R21 Course Outcomes

<table>
<thead>
<tr>
<th>CO</th>
<th>Course Outcomes</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Examine the experimental strength of aggregate materials as per codal provisions.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>Compute the properties of bituminous materials.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Determine the properties of cement by conducting the test.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Define the workability of fresh concrete by conducting tests.</td>
<td>1</td>
</tr>
<tr>
<td>CO5</td>
<td>Estimate the strength of hardened concrete by conducting destructive and non destructive testing.</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C421</th>
<th>Course Name: COMPUTATIONAL LAB</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Encalcate with the usage of recent software’s and its applications in the field of civil engineering</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Analyse the Beam and Slab using Staad Pro software.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>Assess the frame using the Staad Pro.</td>
<td>5</td>
</tr>
<tr>
<td>CO4</td>
<td>Interpret the slope stability by using Geo5.</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Assess the settlement of footing.</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C422</th>
<th>Course Name: INDUSTRIAL ORIENTED MINI PROJECT</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Interpret the literature and develop solutions for framing problem statement.</td>
<td>5</td>
</tr>
<tr>
<td>CO2</td>
<td>Select software techniques for identifying problems.</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Analysis and test the modules of planned project.</td>
<td>4</td>
</tr>
<tr>
<td>CO4</td>
<td>Design technical report and deliver presentations.</td>
<td>6</td>
</tr>
<tr>
<td>CO5</td>
<td>Apply engineering and management principles to achieve project goals.</td>
<td>3</td>
</tr>
</tbody>
</table>
### R21 Course Outcomes

#### B TECH - IV YEAR II SEM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: REHABILITATION AND RETROFITTING OF STRUCTURES</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>C431</td>
<td>CO Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CO1 Illustrate the importance of inspection and maintenance.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CO2 Summarize the Impacts of corrosion and fire damage on structures.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>CO3 Identify the damage assessment and testing of structural components.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CO4 Understand the materials and techniques needed for repairs.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CO5 Examine the failures of the structures and health monitoring with Optimization techniques.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: REMOTE SENSING AND GIS</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>C432</td>
<td>CO Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CO1 Understand the concepts of Photogrammetry and compute the heights of the objects using parallax.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CO2 Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CO3 Understand the basic concept of GIS and its applications; know different types of data representation in GIS.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CO4 Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinates systems.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CO5 Remote sensing gives the provision of understanding about water resources management and monitoring.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name: TECHNICAL SEMINAR</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>C433</td>
<td>CO Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CO1 CO1: Demonstrate the skills in identifying, analysing, and presenting a research topic.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CO2 CO2: Demonstrate the quality of knowledge gained from the literature survey on recent technologies.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CO3 CO3: Demonstrate the skills developed to communicate effectively on engineering activities with the engineering community.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CO4 CO4: Demonstrate ability to effectively manage time in presentation skills.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CO5 CO5: Design a technical report with the principal of ethics.</td>
<td>6</td>
</tr>
</tbody>
</table>
### R21 Course Outcomes

<table>
<thead>
<tr>
<th>C434</th>
<th>Course Name: COMPREHENSIVE VIVA VOCE</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Explain comprehensively to answer questions from all the courses.</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Test Oral Presentation skills by answering questions in a precise and concise manner.</td>
<td>5</td>
</tr>
<tr>
<td>CO3</td>
<td>Build confidence and interpersonal skills.</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Support the students to face interview both in the academic and the industrial sector.</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Improve placements and better performers in their future.</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C435</th>
<th>Course Name: MAJOR PROJECT</th>
<th>Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Students who successfully complete this course will be able to:</td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>CO1: Identity, Analyse and apply suitable current techniques and tools to solve a problem in the civil engineering domain and societal issues.</td>
<td>4</td>
</tr>
<tr>
<td>CO2</td>
<td>CO2: Function effectively in teams to accomplish a common goal.</td>
<td>4</td>
</tr>
<tr>
<td>CO3</td>
<td>CO3: Organise the technical report writing and communication effectively.</td>
<td>6</td>
</tr>
<tr>
<td>CO4</td>
<td>CO4: Extend in lifelong activity.</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>CO5: Define and analyse a problem to assess health, safety and legal issues.</td>
<td>4</td>
</tr>
</tbody>
</table>