



Nagarjuna College of Engineering and Technology

(An Autonomous College under VTU)

2.6.1 Additional Information

CO – PO Mapping

Nagarjuna College of Engineering and Technology

Department of Electronics and Communication Engineering

2015 Scheme

| | |
|-------------|----------------------------------|
| Course Name | Engineering Mathematics-III (IC) |
| Course Code | 15ECM31 |
| Semester | III |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C201.1 | Form partial differential equations and their solutions. |
| C201.2 | Expressing the given functions as infinite series of sine and cosine. |
| C201.3 | Apply Fourier and Z-Transform to different problems |
| C201.4 | Find approximated solutions by numerical methods |
| C201.5 | Use the SCILAB to solve the various types engineering problems |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C201.1 | 2 | 2 | 1 | 1 | 1 | 2 | - | - | - | - | - | - | 3 | 3 | 1 |
| C201.2 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 2 | 2 | 1 |
| C201.3 | 2 | 1 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | 3 | 2 | 2 |
| C201.4 | 2 | 1 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | 2 | 1 | 1 |
| C201.5 | 2 | 1 | 1 | 2 | 1 | 2 | - | - | - | - | - | - | 2 | 2 | 1 |
| C201 | 2 | 1.2 | 1.4 | 1.2 | 1 | 1.6 | - | - | - | - | - | - | 2.4 | 2 | 1.2 |

| | |
|--------------------|-----------------------------------|
| Course Name | Analog Electronic Circuits |
| Course Code | 15ECT32 |
| Semester | III |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C202.1 | Design rectifiers, clipping and clamping circuits. |
| C202.2 | Analyzing different ways of biasing transistors. |
| C202.3 | Evaluate transistor frequency response. |
| C202.4 | Design of simple amplifier and power amplifies circuits. |
| C202.5 | Analyzing different type's oscillator circuits for particular frequencies. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PS01 | PS02 | PS03 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C202.1 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C202.2 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | 3 | 2 |
| C202.3 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 2 |
| C202.4 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 1 | 2 | 2 |
| C202.5 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 3 | 2 |
| C202 | 3 | 3 | 3 | 2.8 | 2 | - | - | - | - | - | - | 1.4 | 2 | 2.4 | 1.8 |

| | |
|--------------------|---------------------|
| Course Name | Logic Design |
| Course Code | 15ECT33 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C203.1 | Design an optimal solution for a given digital problems using K- Maps. |
| C203.2 | Design combinational digital circuits for the given specifications. |
| C203.3 | Describe the different types of Flip-Flops. |
| C203.4 | Design sequential digital circuits for given specifications. |
| C203.5 | Develop the appropriate Mealy FSM or Moore FSM. |

| POS COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO1 0 | PO1 1 | PO1 2 | PSO 1 | PSO 2 | PSO3 |
|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|------|
| C203.1 | 2 | 3 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C203.2 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 | 2 |
| C203.3 | 1 | 2 | 3 | 1 | - | - | - | - | - | - | - | 1 | 2 | 3 | 3 |
| C203.4 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | 3 | 3 |
| C203.5 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 1 | 3 | 3 |
| C203 | 1.4 | 2.4 | 2.4 | 1.6 | - | - | - | - | - | - | - | 1.75 | 2 | 2.6 | 2.4 |

| | |
|--------------------|---------------------|
| Course Name | Field Theory |
| Course Code | 15ECT34 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C204.1 | Describe the basics of vectors, coordinate systems and electrostatics. |
| C204.2 | Discuss the concepts of energy and potential for the boundary conditions. |
| C204.3 | Analyzing basic theory of Poisson's and Laplace's equations. |
| C204.4 | Apply the laws and theorems governing magnetic field |
| C204.5 | Apply the Maxwell's equations and relationship between maxwell's equations and uniform plane wave. |
| | |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|------|------|------|
| C204.1 | 2 | 3 | - | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C204.2 | 2 | 3 | 2 | 2 | - | 1 | = | - | - | - | - | 1 | 2 | 3 | 2 |
| C204.3 | 2 | 1 | 2 | 3 | - | 1 | - | - | - | - | - | - | 3 | 3 | 1 |
| C204.4 | 2 | 3 | 3 | 1 | - | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C204.5 | 2 | 2 | 3 | 2 | 2 | - | 2 | - | - | - | - | 2 | 3 | 3 | 2 |
| C204 | 2 | 2.4 | 2.5 | 1.8 | 2 | 1.33 | 2 | | | | | 1.67 | 2.4 | 2.6 | 1.4 |

| | |
|--------------------|------------------------------|
| Course Name | Network Analysis (IC) |
| Course Code | 15ECI35 |
| Semester | III |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C205.1 | Apply nodal and mesh analysis techniques to various electric circuits. |
| C205.2 | Design various network theorems to simplify circuits. |
| C205.3 | Design electric circuits using Laplace transformation. |
| C205.4 | Evaluate circuits using network topology. |
| C205.5 | Design two-port networks using R-l, R-C or L-C components. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C205.1 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 | 1 |
| C205.2 | 2 | 3 | 3 | 2 | - | - | - | - | 1 | - | - | 1 | 2 | 3 | 1 |
| C205.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | 2 | 2 | 3 | 2 |
| C205.4 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 1 | 3 | 1 |
| C205.5 | 2 | 2 | 3 | 1 | 1 | - | - | - | - | 1 | 1 | 2 | 2 | 3 | 2 |
| C205 | 2 | 2.8 | 2.6 | 2 | 1.5 | | | | 1.5 | 1 | 1 | 1.75 | 2 | 2.8 | 1.4 |

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|--------------------|---|
| Course Name | Computer Communication and Networking (IC) |
| Course Code | 15ECI361 |
| Semester | III |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C206.1.1 | Describe the basics of data communication system and network models. |
| C206.1.2 | Distinguish between different techniques of digital transmissions. |
| C206.1.3 | Compare different methods of analog transmissions. |
| C206.1.4 | Explain various types of multiplexing and spread spectrum mechanisms. |
| C206.1.5 | Solve problems of error detection and correction using Block coding and CRC mechanisms. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C206.1.1 | 3 | 1 | 2 | 2 | 2 | | | - | - | - | - | - | 2 | 3 | 1 |
| C206.1.2 | 3 | 2 | 3 | 1 | - | | | - | - | - | - | - | 3 | 2 | 1 |
| C206.1.3 | 2 | 2 | 2 | 1 | - | | | - | - | - | 2 | - | 2 | 2 | 2 |
| C206.1.4 | 2 | 2 | 1 | 1 | - | | | - | - | - | - | - | 2 | 1 | 1 |
| C206.1.5 | 2 | 2 | 3 | 2 | 2 | | | - | - | - | 1 | - | 2 | 2 | 1 |
| C206.1 | 2.4 | 1.8 | 2.2 | 1.4 | 2 | | | | | | 1.5 | | 2.2 | 2 | 1.2 |

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|--------------------|---|
| Course Name | Creating Interactive and Responsive Web Pages (IC) |
| Course Code | 15ECI362 |
| Semester | III |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C206.2.1 | Develop web layouts with style sheets and web screens in a presentable form. |
| C206.2.2 | Write interactive web pages through form validations and other methods. Use the same in UI development. |
| C206.2.3 | Use the Java Script libraries to accelerate UI development. |
| C206.2.4 | Design and develop responsive and mobile first web pages. |
| C206.2.5 | Develop applications by using synchronous and asynchronous communication over web. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C206.2.1 | 1 | 1 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 3 |
| C206.2.2 | 2 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 3 | 2 | 2 | 3 |
| C206.2.3 | 2 | 3 | 2 | 1 | 2 | - | - | - | - | - | 2 | 2 | 1 | 3 | 3 |
| C206.2.4 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 | 3 |
| C206.2.5 | 1 | 1 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 3 | 3 |
| C206.2 | 1.6 | 1.8 | 2 | 1.4 | 2 | - | - | - | - | - | 1.5 | 2.2 | 1.8 | 2.6 | 3 |

| | |
|--------------------|---|
| Course Name | Analog Electronics Circuits Laboratory |
| Course Code | 15ECL37 |
| Semester | III |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C207.1 | Design various types of clipping and clamping circuits. |
| C207.2 | Analyze and design different rectifiers. |
| C207.3 | Design BJT amplifier and power amplifier. |
| C207.4 | Design and evaluate Darlington emitter follower. |
| C207.5 | Design and evaluate the performance of various types of oscillators. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C207.1 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | - | 2 | 1 | 2 | 3 | 1 |
| C207.2 | 2 | 2 | 2 | 3 | | - | - | - | 2 | - | 2 | 2 | 2 | 3 | 2 |
| C207.3 | 2 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | 1 | 2 | 3 | 1 |
| C207.4 | 2 | 2 | 1 | 2 | 3 | - | - | - | 2 | - | 2 | 1 | 2 | 3 | 1 |
| C207.5 | 2 | 1 | 2 | 2 | 1 | - | - | - | 2 | - | 1 | 2 | 2 | 3 | 1 |
| C207 | 2.2 | 2 | 2.2 | 2.2 | 1.75 | | | | 2 | | 1.8 | 1.4 | 2 | 3 | 1.2 |

| | |
|--------------------|--------------------------------|
| Course Name | Logic Design Laboratory |
| Course Code | 15ECL38 |
| Semester | III |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C208.1 | Design and analyze simple Boolean expression using basic gates. |
| C208.2 | Design and verification of various Combinational Circuits. |
| C208.3 | Analyze practical application of decoder chip and priority encoder. |
| C208.4 | Evaluate the various Sequential Circuits. |
| C208.5 | Design and analyze various types of registers and counters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C208.1 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 1 |
| C208.2 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 1 |
| C208.3 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| C208.4 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| C208.5 | 2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| C208 | 1.2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 1.6 |

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|--------------------|--|
| Course Name | Electronic Instrumentation (IC) |
| Course Code | 15ECI363 |
| Semester | III |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C206.3.1 | Analyze characteristics of various measuring instruments and different types of errors. |
| C206.3.2 | Describe the different current and voltage meters. |
| C206.3.3 | Use the CRO and able to measure different parameters. |
| C206.3.4 | Use Signal generators and function generator |
| C206.3.5 | Describe the working of different types of Transducers. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C206.3.1 | 3 | 2 | 2 | 1 | - | - | - | -- | - | - | - | - | 2 | 2 | 1 |
| C206.3.2 | 2 | 3 | 1 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| C206.3.3 | 3 | 2 | 1 | 3 | - | - | - | - | - | - | 2 | - | 1 | 3 | 1 |
| C206.3.4 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C206.3.5 | 3 | 1 | 2 | 3 | 1 | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C206.3 | 2.6 | 2 | 1.6 | 2.2 | 1.5 | - | - | - | - | - | 1.5 | - | 1.8 | 2.2 | 1.2 |

| | |
|--------------------|--------------------------------|
| Course Name | Logic Design Laboratory |
| Course Code | 15ECL38 |
| Semester | III |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C208.1 | Design and analyze simple Boolean expression using basic gates. |
| C208.2 | Design and verification of various Combinational Circuits. |
| C208.3 | Analyze practical application of decoder chip and priority encoder. |
| C208.4 | Evaluate the various Sequential Circuits. |
| C208.5 | Design and analyze various types of registers and counters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C208.1 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 1 |
| C208.2 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 1 |
| C208.3 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| C208.4 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| C208.5 | 2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| C208 | 1.2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | 2 | 2 | 3 | 1.6 |

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|--------------------|--------------------------------|
| Course Name | Soft Skills Development |
| Course Code | 15ECH39 |
| Semester | III |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C209.1 | Get rid of stage fear and answer questions from audience. |
| C209.2 | Communicate confidently and fluently. |
| C209.3 | Comprehend and prepare reports effectively. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C209.1 | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 | 2 | 2 | 1 |
| C209.2 | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 | 1 | 1 | 1 |
| C209.3 | - | - | - | - | - | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | 1 |
| C209 | - | - | - | - | - | - | - | - | 3 | 3 | 2 | 3 | 1.67 | 1.67 | 1 |

| | |
|--------------------|--|
| Course Name | Engineering Mathematics-IV (IC) |
| Course Code | 15ECM41 |
| Semester | IV |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C210.1 | Determine the Differentiation, Integration and solutions of Differential equations using numerical methods. |
| C210.2 | Find the differentiation and integrals of complex functions. |
| C210.3 | Find the probability using different distributions and analysis by using samplings |
| C210.4 | Use the statistical software's. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------------|------|-----|------|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| C210.1 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 3 | 3 | 1 |
| C210.2 | 2 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C210.3 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | - | 2 | - | 3 | 2 | 2 |
| - C210.4 | 3 | 3 | 3 | 1 | 3 | - | - | - | - | - | - | 3 | 2 | 1 | 1 |
| | - | - | - | - | - | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C210 | 2.25 | 3 | 2.25 | 1 | 1.75 | | | | | | 1.5 | 3 | 2.4 | 2 | 1.2 |

| | |
|--------------------|-----------------------|
| Course Name | Microprocessor |
| Course Code | 15ECT42 |
| Semester | IV |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C211.1 | Describe the architecture of 8086. |
| C211.2 | Analyze the appropriate usage of instructions in programming. |
| C211.3 | Develop the interfacing programs with various interfaces. |
| C211.4 | Analyze the appropriate algorithms for solving problems in math coprocessor. |
| C211.5 | Distinguish various advanced processors. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C211.1 | 3 | 2 | 2 | - | 2 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |
| C211.2 | 2 | 2 | - | - | - | 2 | 1 | - | - | - | 2 | 2 | 2 | 3 | 2 |
| C211.3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | - | - | - | 2 | 2 | 3 | 1 | 1 |
| C211.4 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 |
| C211.5 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 1 | 1 | 1 |
| C211 | 2.8 | 2.4 | 2.75 | 3 | 2.5 | 2.4 | 2 | | | 2 | 2 | 2.2 | 2 | 1.8 | 1.6 |

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|--------------------|----------------------------|
| Course Name | Fundamentals of HDL |
| Course Code | 15ECT43 |
| Semester | IV |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C212.1 | Describe the various descriptions in VHDL and Verilog. |
| C212.2 | Develop program using data flow and behavioral descriptions. |
| C212.3 | Develop program using structural and mixed language description. |
| C212.4 | Develop programs using procedure, task, and function. |
| C212.5 | Analyze and synthesis VHDL and VERILOG codes for digital circuits. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C212.1 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C212.2 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C212.3 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 2 | 1 | 1 |
| C212.4 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C212.5 | 1 | 2 | 3 | 1 | 2 | - | - | - | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| C212 | 1.2 | 2 | 3 | 1.8 | 2.75 | - | - | - | 2.75 | 2 | 1 | 1 | 1.6 | 1.8 | 1 |

| | |
|--------------------|----------------------------|
| Course Name | Signals and Systems |
| Course Code | 15ECT44 |
| Semester | IV |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C213.1 | Discriminate various elementary signals and identify the properties of systems. |
| C213.2 | Compute convolution operation on continuous and discrete time signals and express difference and differential equations as block diagram. |
| C213.3 | Express the signals using Fourier transform and apply their properties for solving differential and difference equation. |
| C213.4 | Analyze Z transforms and inverse Z transforms using various methods. |
| C213.5 | Analyze LTI systems using Z transforms. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C213.1 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C213.2 | 2 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | 1 | 1 | 1 | 2 |
| C213.3 | 2 | 2 | 2 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 |
| C213.4 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | 3 | 1 | 1 |
| C213.5 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 1 |
| C213 | 2.2 | 2.4 | 2.4 | 2 | 1.33 | - | - | - | - | - | 1.5 | 1 | 2 | 1.4 | 1.2 |

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|--------------------|--|
| Course Name | Linear IC's and Applications (IC) |
| Course Code | 15ECI451 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C214.1.1 | Describe the practical OP-AMP specifications and characteristics. |
| C214.1.2 | Determine OP-AMP as AC amplifiers. |
| C214.1.3 | Analyzing stability condition of OP-AMP |
| C214.1.4 | Analyzing OP-AMP linear and nonlinear applications. |
| C214.1.5 | Analyzing of 555 timers, PLL and their applications. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C214.1.1 | 2 | 3 | 2 | 2 | 2 | 1 | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C214.1.2 | 1 | 2 | 2 | 2 | - | 2 | - | - | - | - | - | 2 | 1 | 1 | 2 |
| C214.1.3 | 2 | 3 | 2 | 1 | - | 2 | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C214.1.4 | 2 | 2 | 1 | 2 | 1 | 2 | - | - | - | - | - | 2 | 3 | 1 | 1 |
| C214.1.5 | 3 | 1 | 1 | 1 | - | 1 | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C214.1 | 2 | 2.2 | 1.6 | 1.6 | 1.5 | 1.6 | - | - | - | - | 2 | 2 | 2 | 1.4 | 1.2 |

| | |
|--------------------|----------------------------------|
| Course Name | Fundamentals of VLSI (IC) |
| Course Code | 15ECI452 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C214.2.1 | Describe the fabrication process and VLSI design flow. |
| C214.2.2 | Discuss V-I and C-V characteristics of MOSFETS. |
| C214.2.3 | Analyze sequential and combinational logic circuits using CMOS. |
| C214.2.4 | Discuss the concepts of testing and dynamic CMOS circuits. |
| C214.2.5 | Describe the concepts of low power VLSI design. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C214.2.1 | 2 | 2 | 1 | 1 | 3 | | | - | - | - | 3 | - | 2 | 2 | 1 |
| C214.2.2 | 2 | - | 1 | 1 | - | | | - | - | - | 2 | - | 1 | 2 | 1 |
| C214.2.3 | 1 | 3 | 3 | 2 | 2 | | | - | - | - | 2 | - | 2 | 1 | 1 |
| C214.2.4 | 2 | 3 | 3 | 2 | - | | | - | - | - | 3 | - | 1 | 2 | 1 |
| C214.2.5 | 2 | 1 | 1 | 1 | - | | | - | - | - | 1 | - | 2 | 2 | 1 |
| C214.2 | 1.8 | 2.25 | 1.8 | 1.4 | 2.5 | | | | | | 2.2 | | 1.6 | 1.8 | 1 |

| | |
|--------------------|--|
| Course Name | Introduction to Programming using Python (IC) |
| Course Code | 15ECI453 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C214.3.1 | Apply the concepts of Object Oriented principles used in Python. |
| C214.3.2 | Apply Types, Type Operators and Built-in functions and use the same in developing specific programs. |
| C214.3.3 | Apply the usage of built-in libraries, creation of customized libraries and efficient ways to store and retrieve data. |
| C214.3.4 | Use file handling and exception handling mechanisms and apply the same in solving specific problems. |
| C214.3.5 | Apply techniques using regular expressions and apply the same in solving specific problems. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C214.3.1 | 2 | 1 | 2 | 1 | 3 | | | - | 2 | - | 3 | 2 | 2 | 2 | 1 |
| C214.3.2 | 2 | 2 | 2 | 3 | 2 | | | - | 1 | - | 2 | 3 | 3 | 2 | 1 |
| C214.3.3 | 2 | 2 | 3 | 2 | 1 | | | - | 2 | - | 2 | 2 | 2 | 3 | 1 |
| C214.3.4 | 3 | 2 | 3 | 2 | 2 | | | - | 2 | - | 3 | 2 | 2 | 2 | 1 |
| C214.3.5 | 3 | 3 | 3 | 2 | 2 | | | - | 3 | - | 3 | 2 | 1 | 3 | 2 |
| C214.3 | 2.4 | 2 | 2.6 | 2 | 2 | | | | 2 | | 2.6 | 2.2 | 2 | 2.4 | 1.2 |

| | |
|--------------------|-----------------------------------|
| Course Name | Renewable Energy Resources |
| Course Code | 15ECT461 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C215.1.1 | Explain the present energy scenario and the available Renewable Energy Resources. |
| C215.1.2 | Describe the basics of solar radiation geometry and various measurement techniques. |
| C215.1.3 | Analyze the knowledge gained in tapping the solar energy through solar thermal devices, pv conversion and their performance analysis. |
| C215.1.4 | Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal. |
| C215.1.5 | Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability. |

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|--------------------|---|
| Course Name | Object Oriented Programming with C++ |
| Course Code | 15ECT462 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C215.2.1 | Apply the concepts of Object-Oriented Programming. |
| C215.2.2 | Implement the concepts of classes and objects. |
| C215.2.3 | Apply the concepts of inheritance to solve complex problems. |
| C215.2.4 | Implement mechanism of virtual function and polymorphism. |
| C215.2.5 | Develop generic function to perform different operations on different data types and implement exception handling. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| COs | | | | | | | | | | | | | | | |
| C215.2.1 | 3 | 2 | 1 | 1 | | | | - | - | - | - | - | 2 | 2 | 1 |
| C215.2.2 | 3 | 2 | 2 | 1 | 2 | | | - | - | - | - | - | 3 | 2 | 2 |
| C215.2.3 | 2 | 3 | 3 | 1 | 2 | | | - | - | - | 2 | - | 2 | 1 | 1 |
| C215.2.4 | 3 | 2 | 1 | 2 | 1 | | | - | - | - | - | - | 2 | 2 | 1 |
| C215.2.5 | 2 | 3 | 2 | 1 | 2 | | | - | - | - | 1 | - | 2 | 1 | 1 |
| C215.2 | 2.6 | 2.4 | 1.8 | 1.2 | 1.75 | | | | | | 1.5 | | 2.2 | 1.6 | 1.2 |

| | |
|--------------------|------------------------|
| Course Name | Smart Materials |
| Course Code | 15ECT463 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C215.3.1 | Explain the characteristics of composites and smart materials in the product design process. |
| C215.3.2 | Identify various types of sensing and actuation devices. |
| C215.3.3 | Analyze the optics and design structures using smart materials. |
| C215.3.4 | Demonstrate the working principles of different control systems. |
| C215.3.5 | Describe the principles of vibration and modal analysis. |

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| Course Name | Management Information Systems |
| Course Code | 15ECT464 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C215.4.1 | Describe the roles and functionalities of information system. |
| C215.4.2 | Analyze types of solutions for business and its applications. |
| C215.4.3 | Analyze the usage of Intranet and Extranet in business applications. |
| C215.4.4 | Describe database management and competitive strategic approach of information systems in business applications. |
| C215.4.5 | Describe various approaches in managing information technology. |

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|--------------------|-----------------------------------|
| Course Name | Microprocessors Laboratory |
| Course Code | 15ECL47 |
| Semester | IV |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C216.1 | Develop the program for data transfer. |
| C216.2 | Develop arithmetic logical and bit manipulation Assembly level programs. |
| C216.3 | Develop programs to understand branch and looping instruction. |
| C216.4 | Analyze the usage of appropriate interrupts in programming and interfacing. |
| C216.5 | Analyze and interface the peripherals using assembly level language. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C216.1 | 3 | 2 | 2 | 2 | 2 | | | - | 2 | - | 2 | 2 | 2 | 2 | 2 |
| C216.2 | 2 | 2 | 3 | 3 | 2 | | | - | 2 | - | 2 | 2 | 2 | 3 | 2 |
| C216.3 | 2 | 3 | 2 | 2 | 2 | | | - | 3 | - | 3 | 2 | 3 | 1 | 1 |
| C216.4 | 2 | 2 | 3 | 2 | 2 | | | - | 2 | - | 2 | 2 | 2 | 2 | 2 |
| C216.5 | 2 | 3 | 3 | 3 | 2 | | | - | 2 | - | 3 | 2 | 1 | 1 | 1 |
| C216 | 2.2 | 2.4 | 2.6 | 2.4 | 2 | | | | 2.2 | | 2.4 | 2 | 2 | 1.8 | 1.6 |

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|--------------------|-----------------------|
| Course Name | HDL Laboratory |
| Course Code | 15ECL48 |
| Semester | IV |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C217.1 | Develop HDL programs for Logic gates. |
| C217.2 | Develop HDL programs for combinational designs. |
| C217.3 | Develop HDL programs for sequential designs. |
| C217.4 | Develop HDL programs for various counters. |
| C217.5 | Analyze and Interface with various electrical components. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C217.1 | 2 | 2 | 3 | 2 | 3 | - | | - | - | - | - | - | 2 | 2 | 1 |
| C217.2 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C217.3 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 2 | 1 | 1 |
| C217.4 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C217.5 | 1 | 2 | 3 | 1 | 2 | | | - | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| C217 | 1.2 | 2 | 3 | 1.8 | 2.8 | | | | 2.75 | 2 | 1 | 1 | 1.6 | 1.8 | 1 |

| | |
|--------------------|--------------------------------|
| Course Name | Soft Skills Development |
| Course Code | 15ECH49 |
| Semester | IV |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C218.1 | Get rid of stage fear and answer questions from audience. |
| C218.2 | Communicate confidently and fluently |
| C218.3 | Comprehend and prepare reports effectively. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C218.1 | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 | 1 | 1 | 3 |
| C218.2 | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 | 1 | 1 | 3 |
| C218.3 | - | - | - | - | - | - | - | - | 3 | 3 | 2 | 3 | 1 | 1 | 3 |
| C218 | - | - | - | - | - | - | - | - | 3 | 3 | 2 | 3 | 1 | 1 | 3 |

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|--------------------|------------------------------|
| Course Name | Communication Systems |
| Course Code | 15ECT51 |
| Semester | V |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C301.1 | Determine the generation and demodulation of AM and DSBSC systems. |
| C301.2 | Understand the generation and demodulation of SSB, VSB and employ AM radio system. |
| C301.3 | Describe the direct and indirect method of generation of FM. |
| C301.4 | Evaluate the FM radio systems and its detection. |
| C301.5 | Analyze the noise performance of receivers. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C301.1 | 3 | 1 | 2 | 1 | 3 | | | - | - | - | - | 1 | 2 | 2 | 1 |
| C301.2 | 2 | 2 | 2 | 2 | - | | | - | - | - | - | 2 | 3 | 3 | 2 |
| C301.3 | 2 | 1 | 3 | 2 | - | | | - | - | - | 2 | 1 | 2 | 2 | 1 |
| C301.4 | 3 | 2 | 1 | 2 | 1 | | | - | - | - | - | 1 | 1 | 1 | 1 |
| C301.5 | 2 | 2 | 1 | 3 | - | | | - | - | - | 1 | 2 | 2 | 2 | 1 |
| C301 | 2.4 | 1.6 | 1.8 | 2 | 2 | | | | | | 1.5 | 1.4 | 2 | 2 | 1.2 |

| | |
|--------------------|-------------------------|
| Course Name | Microcontrollers |
| Course Code | 15ECT52 |
| Semester | V |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C302.1 | Solve basic binary math operations using the microcontroller. |
| C302.2 | Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target Microcontroller. |
| C302.3 | Analyze program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program. |
| C302.4 | Apply knowledge of the microcontroller's internal registers and operations by use of a PC based microprocessor Simulator and write assemble assembly language programs. |
| C302.5 | Design electrical circuitry to the microcontroller I/O ports in order to interface the processor to external devices. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C302.1 | 3 | 2 | 3 | 1 | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C302.2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | 2 | 2 | 3 | 1 | 1 |
| C302.3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C302.4 | 3 | 2 | 2 | 3 | 1 | - | - | - | - | - | 2 | 2 | 3 | 2 | 2 |
| C302.5 | 3 | 1 | 3 | 3 | 2 | - | - | - | - | - | 3 | 2 | 3 | 2 | 1 |
| C302 | 2.8 | 1.6 | 2.6 | 2 | 1.33 | | | | | | 2.2 | 2 | 2 | 1.6 | 1.2 |

| | |
|-------------|-------------------------------|
| Course Name | Information Theory and Coding |
| Course Code | 15ECT53 |
| Semester | V |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C303.1 | Compute entropy and information rate of a source. |
| C303.2 | Encode the source output using encoding algorithms and coding techniques. |
| C303.3 | Determine the channel capacity of different channels and also the mutual information |
| C303.4 | Implement the error control coding, methods of controlling errors and Error correction and detection. |
| C303.5 | Encode using bit shift register, syndrome calculate and complete knowledge of BCH and burst error correcting codes. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C303.1 | 3 | 3 | 2 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 3 | 2 | 1 |
| C303.2 | 3 | 3 | 3 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 2 | 3 | 1 |
| C303.3 | 3 | 2 | 2 | 1 | 1 | | | - | - | - | 1 | 1 | 3 | 3 | 1 |
| C303.4 | 3 | 3 | 2 | 1 | 1 | | | - | - | - | 1 | 1 | 2 | 3 | 1 |
| C303.5 | 3 | 3 | 2 | 1 | 1 | | | - | - | - | 1 | 1 | 3 | 3 | 2 |
| C303 | 3 | 2.8 | 2.2 | 1 | 1 | | | | | 1 | 1 | 1 | 2.6 | 2.8 | 1.2 |

| | |
|-------------|----------------------|
| Course Name | Control Systems (IC) |
| Course Code | 15ECI541 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C304.1.1 | Employ mathematical modelling techniques to determine the transfer function of a given system. |
| C304.1.2 | Analyze the time response of first and second order systems for different test input signals. |
| C304.1.3 | Apply the concept of RH criterion and Nyquist criterion to determine the stability of a given transfer functions. |
| C304.1.4 | Interpret the concept of root locus to determine the stability of a given transfer function. |
| C304.1.5 | Know the frequency domain specification fundamentals and sketch a Bode plot to analyze Stability of a given systems and able to write state model for the given system. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C304.1.1 | 3 | 3 | 2 | 2 | - | 1 | - | - | - | - | - | 1 | 3 | 2 | 1 |
| C304.1.2 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 2 | 2 | 2 | 3 | 1 |
| C304.1.3 | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | 1 | 1 | 3 | 3 | 1 |
| C304.1.4 | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | 1 | 1 | 2 | 3 | 1 |
| C304.1.5 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 3 | 3 | 2 |
| C304.1 | 2.6 | 2.2 | 2.4 | 2.4 | 2 | 1 | | | | | 1.25 | 1.2 | 2.6 | 2.8 | 1.2 |

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|-------------|----------------------------|
| Course Name | Low Power VLSI Design (IC) |
| Course Code | 15ECI542 |
| Semester | V |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C304.2.1 | Distinguish between different types of MOSFET devices. |
| C304.2.2 | Analyze different principles of low power VLSI design |
| C304.2.3 | Apply the concept of transistor sizing for synthesis of low power. |
| C304.2.4 | Design and test of low-voltage CMOS circuits |
| C304.2.5 | Estimate the power consumption of VLSI circuits & optimize it |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|-----|-----|-----|-----|-----|------|------------|------------|------|------|------|
| C304.2.1 | 2 | 1 | 2 | 3 | | | | - | - | - | 2 | 1 | 3 | 2 | 1 |
| C304.2.2 | 3 | 3 | 1 | 1 | | | | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C304.2.3 | 2 | 1 | 1 | 2 | | | | - | - | - | 2 | 1 | 3 | 3 | 1 |
| C304.2.4 | 2 | 2 | 3 | 3 | | | | - | - | - | 2 | 1 | 2 | 1 | 1 |
| C304.2.5 | 3 | 2 | 2 | 3 | | | | - | - | - | 3 | 2 | 2 | 2 | 2 |
| C304.2 | 2.4 | 1.8 | 1.8 | 2.4 | | | | | | | 2.2 | 1.4 | 2.4 | 2 | 1.2 |

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|-------------|---------------------------|
| Course Name | Microwaves and RADAR (IC) |
| Course Code | 15ECI543 |
| Semester | V |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C304.3.1 | Define line parameters and analyze various transmission lines and resonators. |
| C304.3.2 | Understand the basic concepts of diodes and its applications. |
| C304.3.3 | Apply the concepts of S parameters to analyze waveguide Tees. |
| C304.3.4 | Analyze the differences between various strip lines and its applications |
| C304.3.5 | Apply the concepts of RADAR to find range of the target object and velocity of the target. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|----------|-----|-----|-----|-----|------|------------|------------|------|------|------|
| C304.3.1 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 2 |
| C304.3.2 | 3 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | 2 | 1 |
| C304.3.3 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | 2 | 2 | 2 | 3 | 2 |
| C304.3.4 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| C304.3.5 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 3 | 1 |
| C304.3 | 2.8 | 2.4 | 2.2 | 2.4 | 2 | | | | | | 1.5 | 1.4 | 2 | 2.4 | 1.4 |

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|-------------|--|
| Course Name | Digital System Design using Verilog (IC) |
| Course Code | 15ECI551 |
| Semester | V |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C305.1.1 | Analyze and verify various combinational circuits. |
| C305.1.2 | Discuss number basics and sequential basics in Verilog. |
| C305.1.3 | Analyze the appropriate usage of instructions and data types. |
| C305.1.4 | Analyze various I/O interfacing and software. |
| C305.1.5 | Describe and verify accelerators and design methodologies. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C305.1.1 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 3 | 2 | 1 |
| C305.1.2 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 1 | 2 | 2 | 1 |
| C305.1.3 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C305.1.4 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C305.1.5 | 2 | 1 | 2 | 3 | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 |
| C305.1 | 2 | 2.2 | 2.6 | 2.2 | 2.4 | | | | | | 2 | 1.8 | 2.4 | 2 | 1.2 |

| | |
|--------------------|--|
| Course Name | Object Oriented Programming with JAVA |
| Course Code | 15ECI552 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C305.2.1 | Explain the basic concepts of Java Technology and its features. |
| C305.2.2 | Explain the OOPs concepts. |
| C305.2.3 | Write programs in Java. |
| C305.2.4 | Analyze data structures like Collections, Lists, etc. |
| C305.2.5 | Write defensive programming using Exception Handling. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|----------|----------|------------|------------|-----|-----|-----|-----|------|----------|------|------|------|------|
| C305.2.1 | 2 | 2 | 2 | 2 | 2 | | | - | - | - | 3 | - | 2 | 2 | 1 |
| C305.2.2 | 2 | 3 | 2 | 2 | 1 | | | - | - | - | 2 | - | 2 | 2 | 1 |
| C305.2.3 | 3 | 2 | 3 | 2 | 1 | | | - | - | - | 2 | - | 1 | 2 | 1 |
| C305.2.4 | 2 | 2 | 1 | 2 | 3 | | | - | - | - | 2 | - | 2 | 1 | 1 |
| C305.2.5 | 2 | 1 | 2 | 3 | 1 | | | - | - | - | 1 | - | 2 | 1 | 1 |
| C305.2 | 2.2 | 2 | 2 | 2.2 | 1.6 | | | | | | 2 | | 1.8 | 1.6 | 1 |

| | |
|--------------------|---------------------|
| Course Name | Mechatronics |
| Course Code | 15ECT561 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C306.1.1 | Design and conduct experiments to evaluate the performance of a mechatronics system |
| C306.1.2 | Design mechatronics component, system or process to meet desired needs |
| C306.1.3 | Use the techniques, skills, and modern mechatronics engineering tools necessary for engineering practice. |
| C306.1.4 | Identify and evaluate ethical ramifications and professional responsibilities in a variety of situations |
| C306.1.5 | Discuss the impact of engineering on society, safety, and environment in relation to contemporary issues |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|----------|----------|-----|-----|-----|-----|------|------------|------|------|------|------|
| C306.1.1 | 1 | 1 | 2 | 1 | 3 | | | - | - | - | 3 | - | 2 | 2 | 1 |
| C306.1.2 | 2 | 1 | 2 | 2 | - | | | - | - | - | 3 | - | 2 | 2 | 1 |
| C306.1.3 | 2 | 2 | 3 | 2 | - | | | - | - | - | 2 | - | 1 | 1 | 1 |
| C306.1.4 | 2 | 1 | 1 | 2 | 1 | | | - | - | - | 2 | - | 2 | 1 | 1 |
| C306.1.5 | 2 | 2 | 1 | 3 | - | | | - | - | - | 1 | - | 2 | 1 | 1 |
| C306.1 | 1.8 | 1.4 | 1.8 | 2 | 2 | | | | | | 2.2 | | 1.8 | 1.4 | 1 |

| | |
|--------------------|--|
| Course Name | Energy Engineering and Management |
| Course Code | 15ECT562 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C306.2.1 | Describe the technology behind Steam Power plants and the types of fuels used. |
| C306.2.2 | Understand and describe diesel engine power plants, and the auxiliaries used. |
| C306.2.3 | Differentiate between the various types of Energy forms. |
| C306.2.4 | Understand the management of electric energy |
| C306.2.5 | Describe the methods used in thermal energy management and energy conversation. |

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|--------------------|-----------------------|
| Course Name | Linear Algebra |
| Course Code | 15ECT563 |
| Semester | V |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C306.3.1 | Understand vector spaces, basis, linear transformations and the process of obtaining matrix of linear transformations arising in magnification and rotation of images |
| C306.3.2 | Apply the techniques of QR and singular value decomposition for data compression, least square approximation in solving inconsistent linear systems. |
| C306.3.3 | Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits. |

| | |
|-----------------|--|
| C306.3.4 | Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in control systems and system communications. |
| C306.3.5 | Apply the idea of joint probability distributions and the role of parameter dependent random variables in random process. |

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|--------------------|----------------------------|
| Course Name | Microcontroller Lab |
| Course Code | 15ECL57 |
| Semester | V |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C307.1 | Understand data moving and exchange programs. |
| C307.2 | Analyze and write delay programs. |
| C307.3 | Interface Stepper motor, DC motor to the microcontroller. |
| C307.4 | Discuss seven segment display and keyboard interface. |
| C307.5 | Analyze different types of code conversion programs. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C307.1 | 3 | 3 | 3 | 3 | 2 | | | - | - | - | 3 | 2 | 2 | 2 | 1 |
| C307.2 | 2 | 3 | 3 | 2 | 3 | | | - | - | - | 3 | 2 | 3 | 1 | 1 |
| C307.3 | 2 | 2 | 3 | 2 | 3 | | | - | - | - | 3 | 3 | 2 | 1 | 1 |
| C307.4 | 2 | 2 | 3 | 3 | 3 | | | - | - | - | 3 | 2 | 3 | 2 | 2 |
| C307.5 | 3 | 1 | 3 | 3 | 1 | | | - | - | - | 3 | 2 | 3 | 2 | 1 |
| C307 | 2.4 | 2.2 | 3 | 2.6 | 2.4 | | | | | | 3 | 2.2 | 2 | 1.6 | 1.2 |

| | |
|--------------------|---------------------------------|
| Course Name | Communication System Lab |
| Course Code | 15ECL58 |
| Semester | V |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C308.1 | Demonstrate second order active filters for various frequency bands |
| C308.2 | Understand the design and implementation concept for modulation and demodulation circuit using amplitude modulation. |
| C308.3 | Understand the design and implementation concept for modulation circuit using frequency modulation |
| C308.4 | Analyze the circuit by conducting the precision rectifiers experiment |
| C308.5 | Construct the circuit and demonstrate the characteristics of pre-emphasis and de-emphasis circuit. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|----------|----------|-----|-----|-----|----------|------|----------|------------|------|------|------|
| C308.1 | 3 | 1 | 2 | 1 | 3 | | | - | 3 | - | 3 | 1 | 2 | 2 | 1 |
| C308.2 | 2 | 2 | 2 | 2 | - | | | - | 3 | - | 2 | 2 | 3 | 1 | 1 |
| C308.3 | 2 | 1 | 3 | 2 | - | | | - | 3 | - | 2 | 2 | 2 | 1 | 1 |
| C308.4 | 3 | 2 | 1 | 2 | 1 | | | - | 3 | - | 2 | 2 | 3 | 2 | 2 |
| C308.5 | 2 | 2 | 1 | 3 | - | | | - | 3 | - | 1 | 1 | 3 | 2 | 1 |
| C308 | 2.4 | 1.6 | 1.8 | 2 | 2 | | | | 3 | | 2 | 1.6 | 2 | 2 | 1 |

| | |
|--------------------|-------------------------|
| Course Name | General Aptitude |
| Course Code | 15ECH59 |
| Semester | V |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C309.1 | Solve and analyze different types of Numerical / Arithmetical problems. |
| C309.2 | Solve and analyze different Data interpretation problems. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|----------|----------|------------|----------|----------|-----|-----|-----|------------|------------|------|----------|----------|----------|----------|
| COs | | | | | | | | | | | | | | | |
| C309.1 | 1 | 3 | 3 | 2 | - | - | - | - | 2 | 2 | - | 2 | 3 | 3 | 3 |
| C309.2 | 1 | 3 | 2 | 2 | 2 | - | - | - | 1 | 3 | - | 2 | 3 | 3 | 3 |
| C309 | 1 | 3 | 2.5 | 2 | 2 | | | | 1.5 | 2.5 | | 2 | 3 | 3 | 3 |

| | |
|--------------------|----------------------------------|
| Course Name | Digital Signal Processing |
| Course Code | 15ECT61 |
| Semester | VI |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C310.1 | Implement DFT using linear filtering. |
| C310.2 | Implement DFT using Fast Fourier Transforms. |
| C310.3 | Design and analyze digital FIR filters and structure of FIR filters. |
| C310.4 | Design and analyze digital IIR filters and structure of IIR filters. |
| C310.5 | Explain the concept of Multi-rate signal processing and sample rate conversion. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C310.1 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C310.2 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C310.3 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 1 | 1 | 1 |
| C310.4 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C310.5 | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 1 | 1 |
| C310 | 2.4 | 2.2 | 2.4 | 1.8 | 2.2 | | | | | | 1.8 | 1.8 | 1.8 | 1.4 | 1 |

| | |
|--------------------|------------------------------|
| Course Name | Digital Communication |
| Course Code | 15ECT62 |
| Semester | VI |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C311.1 | Sample a signal and reconstruct it at receiver. |
| C311.2 | Design a PCM, DPCM, DM and ADM systems. |
| C311.3 | Design Base Band shaping for data transmission. |
| C311.4 | Describe system level blocks for BPSK, ASK, DPSK and QPSK systems. |
| C311.5 | Analyze coherent and no-coherent digital modulation systems and understand the basics of spread spectrum technology. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|----------|------------|----------|----------|----------|-----|-----|-----|-----|------|------------|------------|------|------|------|
| C311.1 | 3 | 2 | 2 | 1 | 3 | | | - | - | - | 3 | 1 | 2 | 3 | 1 |
| C311.2 | 3 | 2 | 2 | 2 | - | | | - | - | - | 2 | 1 | 3 | 2 | 2 |
| C311.3 | 3 | 1 | 3 | 2 | - | | | - | - | - | 2 | 2 | 3 | 2 | 1 |
| C311.4 | 3 | 2 | 1 | 2 | | | | - | - | - | 1 | 2 | 2 | 1 | 1 |
| C311.5 | 3 | 2 | 2 | 3 | - | | | - | - | - | 1 | 1 | 2 | 2 | 1 |
| C311 | 3 | 1.8 | 2 | 2 | 3 | | | | | | 1.8 | 1.4 | 2.4 | 2 | 1.2 |

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|-------------|------------------------------|
| Course Name | Antenna and Propagation (IC) |
| Course Code | 15ECI631 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C312.1.1 | Describe the basic parameters of antenna. |
| C312.1.2 | Discuss the concepts of aperture and slot antenna. |
| C312.1.3 | Analyze antenna arrays. |
| C312.1.4 | Understand the concept and principle of special antennas. |
| C312.1.5 | Understand the propagation of radio waves. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C312.1.1 | 3 | 3 | 2 | 3 | | | | - | - | - | - | 1 | 2 | 3 | 1 |
| C312.1.2 | 1 | 2 | 2 | 2 | | | | - | - | - | - | 2 | 2 | 2 | 1 |
| C312.1.3 | 2 | 3 | 1 | 2 | | | | - | - | - | 2 | 1 | 3 | 2 | 1 |
| C312.1.4 | 3 | 2 | 1 | 2 | | | | - | - | - | - | 2 | 2 | 2 | 1 |
| C312.1.5 | 2 | 3 | 2 | 3 | | | | - | - | - | 1 | 1 | 2 | 2 | 2 |
| C312.1 | 2.2 | 2.6 | 1.6 | 2.4 | | | | | | | 1.5 | 1.4 | 2.2 | 2.2 | 1.2 |

| | |
|--------------------|-------------------------------|
| Course Name | Database Concepts (IC) |
| Course Code | 15ECI632 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C312.2.1 | Explain the basic concepts of database and Database Management System. |
| C312.2.2 | Differentiate between relational systems and non-relational systems. |
| C312.2.3 | Describe how to maintain data (CRUD operations) in relational and nonrelational database. |
| C312.2.4 | Manage Java programs to access database management systems using JDBC. |
| C312.2.5 | Save and retrieve data in a safe and consistent manner. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C312.2.1 | 2 | 2 | 2 | 3 | 2 | | | - | - | - | - | - | 2 | 2 | 1 |
| C312.2.2 | 2 | 3 | 1 | 2 | 3 | | | - | - | - | - | - | 2 | 2 | 2 |
| C312.2.3 | 3 | 2 | 2 | 2 | 3 | | | - | - | - | 2 | - | 1 | 1 | 1 |
| C312.2.4 | 2 | 2 | 1 | 3 | 3 | | | - | - | - | - | - | 2 | 2 | 1 |
| C312.2.5 | 3 | 1 | 2 | 3 | 1 | | | - | - | - | 1 | - | 3 | 2 | - |
| C312.2 | 2.4 | 2 | 1.6 | 2.6 | 2.4 | | | | | | 1.5 | | 2 | 1.8 | 1.4 |

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|--------------------|------------|
| Course Name | PBL |
| Course Code | 15ECT644 |
| Semester | VI |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C313.1 | Demonstrate proficient knowledge on the concepts involved. |
| C313.2 | Identify the problem and propose the possible solution through literature survey |
| C313.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C313.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C313.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| C0 | PO1 | PO2 | PO3 | PO4 | P O5 | PO6 | PO7 | PO8 | PO9 | P010 | P011 | PO12 | PS01 | PS02 | PSO3 |
|-------------|-----|-----|-----|-----|---------|-----|-----|-----|-----|------|------|------|------|------|------|
| C313 .1 | 3 | 2 | - | - | | | | | 2 | 3 | | 1 | 1 | 2 | 2 |
| C313 .2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C313 .3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C313 .4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C313 .5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C313 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | | 1 | 1.8 | 1.8 | 1.6 |

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|--------------------|----------------------------|
| Course Name | Operations Research |
| Course Code | 15ECT641 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C313.1.1 | Describe some basics of Linear programming and solve problems on the same |
| C313.1.2 | Analyze Linear programming problems |
| C313.1.3 | Describe and Analyze Transportation problems |
| C313.1.4 | Describe the various methods involved in CPM technique |
| C313.1.5 | Understand the basics of Integer programming |

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| Course Name | Robotics |
| Course Code | 15ECT642 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C313.2.1 | Understand the basics of automation and also brief history of robot and applications. |
| C313.2.2 | Familiarize with the kinematic motions of robot. |
| C313.2.3 | Have good knowledge about robot end effectors and their design concepts. |
| C313.2.4 | Analyze with the Programming methods & various Languages of robots. |
| C313.2.5 | Familiarize with the principles of various Sensors and their applications in robots. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|----------|------------|----------|----------|-----|-----|-----|-----|-----|------|------------|----------|------|------|------|
| C313.2.1 | 1 | 3 | 2 | 1 | - | | | - | - | - | 3 | 2 | 2 | 2 | 2 |
| C313.2.2 | 2 | 1 | 2 | 2 | - | | | - | - | - | 2 | 2 | 2 | 3 | 2 |
| C313.2.3 | 3 | 2 | 3 | 2 | - | | | - | - | - | 2 | 2 | 3 | 1 | 1 |
| C313.2.4 | 2 | 3 | 2 | 3 | - | | | - | - | - | 2 | 2 | 2 | 2 | 2 |
| C313.2.5 | 2 | 2 | 1 | 2 | - | | | - | - | - | 2 | 2 | 1 | 1 | 1 |
| C313.2 | 2 | 2.2 | 2 | 2 | | | | | | | 2.2 | 2 | 2 | 2 | 2 |

| | |
|--------------------|--------------------------------------|
| Course Name | Internet of Things (IoT) (IC) |
| Course Code | 15ECI643 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C313.3.1 | Understand the vision of IoT from a global context. |
| C313.3.2 | Determine the Market perspective of IoT. |
| C313.3.3 | Use of Devices, Gateways and Data Management in IoT. |
| C313.3.4 | Understand the building state of the art architecture in IoT. |
| C313.3.5 | Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints. |

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| Course Name | Digital Signal Processing Lab |
| Course Code | 15ECL65 |
| Semester | VI |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C314.1 | Implement circular and section convolution. |
| C314.2 | Implement linear convolution and circular convolution using DFT and IDFT. |
| C314.3 | Implement digital FIR filter to meet the given specifications. |
| C314.4 | Implement digital IIR filters to meet the given specification. |
| C314.5 | Implement convolution and filtering using DSP processor. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C314.1 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1 | 2 | 2 | 2 |
| C314.2 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1 | 1 | 2 | 2 |
| C314.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C314.4 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C314.5 | 3 | 2 | 2 | 2 | 3 | | | - | - | - | 3 | 2 | 1 | 1 | 1 |
| C314 | 2.2 | 2.8 | 2 | 2 | 2.2 | | | | | | 2.2 | 1.6 | 1.6 | 1.4 | 1.2 |

| | |
|-------------|-------------------|
| Course Name | LabVIEW - Level I |
| Course Code | 15HOE661 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C315.1.1 | Formulate basic aspects of the graphical programming using LabVIEW 2016. |
| C315.1.2 | Develop LabVIEW coding for a specific problem of datalogging, measurement and presentation. |
| C315.1.3 | Handle the error function and errors in the LabVIEW coding. |
| C315.1.4 | Develop coding for data handling and Analysis on the acquired data. |
| C315.1.5 | Design a state machine LabVIEW coding for an applied problem. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.1.1 | 3 | 2 | 2 | 3 | 3 | | | - | - | - | 1 | - | 2 | 2 | 2 |
| C315.1.2 | 2 | 2 | 3 | 2 | 3 | | | - | - | - | 2 | - | 1 | 2 | 1 |
| C315.1.3 | 2 | 2 | 2 | 2 | 3 | | | - | - | - | 2 | - | 1 | 1 | 1 |
| C315.1.4 | 2 | 3 | 2 | 3 | 3 | | | - | - | - | 1 | - | 2 | 1 | 1 |
| C315.1.5 | 3 | 2 | 3 | 3 | 3 | | | - | - | - | 1 | - | 1 | 1 | 1 |
| C315.1 | 2.4 | 2.2 | 2.4 | 2.6 | 3 | | | | | | 1.4 | | 2 | 1.4 | 1.2 |

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|-------------|---------------------|
| Course Name | Yoga and Meditation |
| Course Code | 15HOE662 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.2.1 | Know the basic principles of Yoga. |
| C315.2.2 | Know and practice the basic asanas and their benefits. |
| C315.2.3 | Use Pranayama and Meditation for improving health and mental peace. |
| C315.2.4 | Know the difference between meditation and concentration. |
| C315.2.5 | Apply the principles of Ayurveda and implement them for one's benefit. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.2.1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 | - | 3 | - | | 3 |
| C315.2.2 | - | - | - | - | 3 | 3 | 1 | 2 | 2 | 2 | - | 3 | - | 1 | 3 |
| C315.2.3 | - | - | - | - | - | 1 | 2 | 2 | 1 | 3- | - | 2 | - | 1 | 3 |
| C315.2.4 | - | - | - | - | - | 2 | 2 | 2 | 3 | 1 | - | 2 | - | - | 3 |
| C315.2.5 | - | - | - | - | - | 2 | 2 | 1 | 2 | - | - | 21 | - | - | 3 |
| C315.2 | | | | | 3 | 2.2 | 1.8 | 1.8 | 2 | 1.67 | | 6.2 | - | 1 | 3 |

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|-------------|-------------------------------------|
| Course Name | Music (Carnatic Vocal/Instrumental) |
| Course Code | 15HOE664 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C315.4.1 | Gain knowledge about the theoretical background of carnatic music |
| C315.4.2 | Acquire practical knowledge on basics of Carnatic music. |
| C315.4.3 | Practical demonstration of different Talas. |
| C315.4.4 | Distinguish among various Raagas based on swarasthanas. |
| C315.4.5 | To synchronize the Raaga and Taala. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.4.1 | - | - | - | - | 2 | 3 | - | 3 | 2 | 2 | - | 3 | - | - | 3 |
| C315.4.2 | - | - | - | - | 3 | 1 | - | 2 | 2 | - | - | 2 | - | - | 3 |
| C315.4.3 | - | - | - | - | 1 | 1 | 1 | 2 | 1 | - | - | 2 | - | - | 3 |
| C315.4.4 | - | - | - | - | 1 | 1 | - | 2 | 3 | 1 | - | 3 | - | - | 3 |
| C315.4.5 | - | - | - | - | 1 | - | - | 2 | 3 | 1 | - | 3 | - | - | 3 |
| C315.4 | | | | | 1.6 | 1.5 | 1 | 2.2 | 2.2 | 1.33 | | 2.6 | | | 3 |

| | |
|-------------|----------------------|
| Course Name | Dance (Bharatanatya) |
| Course Code | 15HOE665 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.5.1 | Get an insight into various types of Indian dances. |
| C315.5.2 | Gain knowledge of different instruments used to perform dance. |
| C315.5.3 | Perform exercises on prarthane, Namaskara according to Bharatanatya style. |
| C315.5.4 | Perform basic steps in Abhinaya. |
| C315.5.5 | Recognise and perform different Adavus. |

| POS COs | PO1 | PO 2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|---------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.5.1 | - | - | - | - | 2 | 3 | - | 3 | 2 | 2 | - | 3 | - | - | 3 |
| C315.5.2 | - | - | - | - | 3 | 1 | - | 2 | 2 | - | - | 2 | - | - | 3 |
| C315.5.3 | - | - | - | - | 1 | 1 | 1 | 2 | 1 | - | - | 2 | - | - | 3 |
| C315.5.4 | - | - | - | - | 1 | 1 | - | 2 | 3 | 1 | - | 3 | - | - | 3 |
| C315.5.5 | - | - | - | - | 1 | - | - | 2 | 3 | 1 | - | 3- | - | - | 3 |
| C315.5 | - | - | - | - | 1.6 | 1.5 | 1 | 2.2 | 2.2 | 1.33 | | 2.5 | | | 3 |

| | |
|--------------------|----------------------------------|
| Course Name | Digital Communication Lab |
| Course Code | 15ECL67 |
| Semester | VI |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C316.1 | Implement ASK, PSK and FSK. |
| C316.2 | Implement TDM using optical fiber. |
| C316.3 | Demonstrate the QPSK generation. |
| C316.4 | Realize the design theory concept using software. |
| C316.5 | Analyze and understand the outputs by changing the important parameters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|----------|----------|-----|-----|-----|-----|------|------------|------------|------|------|------|
| C316.1 | 2 | 1 | 2 | 1 | 3 | | | - | - | - | 2 | 1 | 2 | 3 | 2 |
| C316.2 | 2 | 2 | 2 | 2 | - | | | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C316.3 | 2 | 1 | 3 | 2 | - | | | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C316.4 | 3 | 2 | 1 | 2 | 1 | | | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C316.5 | 2 | 2 | 1 | 3 | - | | | - | - | - | 1 | 2 | 2 | 3 | 2 |
| C316 | 2.2 | 1.6 | 1.8 | 2 | 2 | | | | | | 1.8 | 1.8 | 2.6 | 3 | 1.4 |

| | |
|--------------------|---------------------------------|
| Course Name | Mini project and Seminar |
| Course Code | 15ECP69 |
| Semester | VI |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C318.1 | Apply knowledge of electronics and communication, to select topic relevant to theCurrent trends in multidisciplinary engineering domains. |
| C318.2 | Show competence in defining and explaining topics under discussion. |
| C318.3 | Analyze different methodologies, tools and scope for the concept. |
| C318.4 | Use technical resources to study the emerging engineering trends. |
| C318.5 | Write technical report effectively and relate the study and effectively communicate by making an oral presentation. |

| POS COS | PO1 | PO2 | PO3 | PO4 | PO 5 | PO 6 | PO7 | PO8 | PO9 | PO10 | PO1 1 | PO12 | PS01 | PS02 | PSO 3 |
|---------------|-----|------|-----|-----|---------|---------|-----|-----|-----|------|----------|------|------|------|----------|
| C318.1 | 3 | - | - | - | 1 | 1 | - | - | - | - | - | - | 1 | - | 2 |
| C318.2 | 3 | 1 | - | - | 2 | 1 | 1 | - | - | - | - | - | 2 | 1 | 1 |
| C318.3 | 3 | 2 | - | - | 2 | - | - | - | - | - | - | 2 | 1 | - | 3 |
| C318.4 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | - | - | 1 | 2 | 2 |
| C318.5 | 2 | - | - | - | - | - | - | - | 1 | 2 | - | - | 1 | - | 2 |
| C318 | 1.8 | 1.35 | - | - | 1 | 2 | 1 | | 1.5 | 2 | | 2 | 1.2 | 1.5 | 2 |

Faculty Incharge

Nagarjuna College of Engineering and Technology

Department of Electronics and Engineering Communication

| | |
|--------------------|--------------------------|
| Course Name | Power Electronics |
| Course Code | 15ECT71 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C401.1 | Design drive controls for power semiconductor devices. |
| C401.2 | Analyze the operation of single phase and three phase rectifiers with various loads. |
| C401.3 | Design commutation circuits. |
| C401.4 | Design AC-voltage controllers for different configurations. |
| C401.5 | Analyze the operation of choppers and inverters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C401.1 | 2 | 2 | 2 | 1 | 1 | - | 1 | - | 1 | - | 2 | - | 2 | 3 | 1 |
| C401.2 | 2 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | 2 | - | 3 | 3 | 1 |
| C401.3 | 2 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | 2 | - | 2 | 3 | 2 |
| C401.4 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 2 | - | 2 | 2 | 1 |
| C401.5 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | - | - | - | 2 | - | 2 | 2 | 1 |
| C401 | 2.2 | 2.2 | 2 | 1.8 | 1.4 | 1 | 1 | | 1 | | 2 | | 2.2 | 2.6 | 1.2 |

| | |
|--------------------|---------------------------|
| Course Name | Data Communication |
| Course Code | 15ECT72 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C402.1 | Describe layers of OSI model and its functions. |
| C402.2 | Discuss the different protocols of Noiseless and Noisy channels. |
| C402.3 | Analyze different types of Ethernet. |
| C402.4 | Distinguish between Virtual and Connecting LANs. |
| C402.5 | Describe the functions of network layer, Transition from Ipv4 to Ipv6. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C402.1 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C402.2 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C402.3 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 1 | 3 | 2 |
| C402.4 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C402.5 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 | 1 |
| C402 | 2.2 | 2.8 | 2 | 1.8 | | | | | | | | 2 | 1.8 | 2 | 1.2 |

| | |
|--------------------|---|
| Course Name | Optical Fiber Communication (IC) |
| Course Code | 15ECI731 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C403.1.1 | Know the fundamental concepts of OFC. |
| C403.1.2 | Analyze the characteristics of Optical Fiber and functions of various Sources and Detectors. |
| C403.1.3 | Describe various Fiber couplers, connectors and analyse Optical receivers. |
| C403.1.4 | Distinguish Analog and Digital Links. |
| C403.1.5 | Discuss concept of WDM, Optical Amplifiers and Optical networks. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C403.1.1 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | - | - | 1 | 2 | 2 | 2 | 2 | 1 |
| C403.1.2 | 3 | 2 | 1 | 1 | - | 1 | - | - | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| C403.1.3 | 3 | 1 | 1 | - | - | 1 | - | - | - | 1 | 1 | 2 | 1 | 3 | 2 |
| C403.1.4 | 3 | 2 | 1 | - | - | 1 | - | - | - | 2 | 1 | 2 | 2 | 2 | 1 |
| C403.1.5 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | 2 | 1 | 2 | 2 | 1 | 1 |
| C403.1 | 3 | 2 | 1.4 | 1 | 1 | 1 | 1 | | 1 | 1.4 | 1.4 | 2 | 1.8 | 2 | 1.2 |

| | |
|--------------------|---|
| Course Name | Web Technologies – Servlet, JSP (IC) |
| Course Code | 15ECI732 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C403.2.1 | Analyze the concepts of Web Technologies. |
| C403.2.2 | Compare Web Servers and App Servers. |
| C403.2.3 | Implement Request and Response models. |
| C403.2.4 | Demonstrate how to build e-commerce applications using Servlets and JSP. |
| C403.2.5 | Design dynamic web pages using EL Tags |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C403.2.1 | 2 | 2 | 2 | 3 | 2 | | | - | - | - | - | - | 1 | 2 | 1 |
| C403.2.2 | 2 | 3 | 1 | 2 | 3 | | | - | - | - | - | - | 2 | 2 | 1 |
| C403.2.3 | 3 | 2 | 2 | 2 | 3 | | | - | - | - | 2 | - | 2 | 2 | 2 |
| C403.2.4 | 2 | 2 | 1 | 3 | 3 | | | - | - | - | - | - | 1 | 3 | 1 |
| C403.2.5 | 3 | 1 | 2 | 3 | 1 | | | - | - | - | 1 | - | 2 | 2 | 1 |
| C403.2 | 2.4 | 2 | 1.6 | 2.6 | 2.4 | | | | | | 1.5 | | 1.6 | 2.2 | 1.6 |

| | |
|--------------------|-------------------------------|
| Course Name | Wireless Communication |
| Course Code | 15ECT741 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C404.1.1 | Describe basics of wireless communication techniques. |
| C404.1.2 | Analyze and describe the fundamentals of cellular concepts. |
| C404.1.3 | Describe mobile radio communication in depth. |
| C404.1.4 | Distinguish between different types of modulation techniques for mobile radio communication. |
| C404.1.5 | Differentiate the types of Multiple Access schemes. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|------|-----|-----|-----|------|-----|------|------|------|------|------|------|
| C404.1.1 | 3 | 2 | 2 | - | - | 2 | 1 | 1 | - | 2 | 2 | 1 | 2 | 2 | 1 |
| C404.1.2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | - | - | 2 | 1 | 2 | 2 | 2 | 1 |
| C404.1.3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | - | 2 | 2 | 2 | 1 | 3 | 2 |
| C404.1.4 | 3 | 2 | 1 | - | 3 | 1 | 1 | - | - | 3 | 2 | 2 | 2 | 2 | 1 |
| C404.1.5 | 3 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 |
| C404.1 | 3 | 2 | 2.4 | 1.33 | 1.5 | 1.2 | 1 | 1.33 | 1 | 2.2 | 1.6 | 1.8 | 1.8 | 2 | 1.2 |

| | |
|--------------------|--------------------------------|
| Course Name | Artificial Intelligence |
| Course Code | 15ECT742 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C404.2.1 | Design intelligent agents for solving simple gaming by using artificial intelligence. |
| C404.2.2 | Apply non-trivial AI techniques to handle complex problems. |
| C404.2.3 | Apply various symbolic knowledge representation to specific problems. |
| C404.2.4 | Design Knowledge-based agents. |
| C404.2.5 | Understand syntax and semantics of first-order logic. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C404.2.1 | 2 | 2 | 2 | 3 | 1 | | | - | - | - | - | - | 2 | 2 | 1 |
| C404.2.2 | 3 | 3 | 3 | 1 | 1 | | | - | - | - | - | - | 2 | 2 | 1 |
| C404.2.3 | 3 | 2 | 2 | 2 | 3 | | | - | - | - | - | - | 2 | 3 | 2 |
| C404.2.4 | 2 | 2 | 1 | 2 | 2 | | | - | - | - | - | - | 2 | 2 | 1 |
| C404.2.5 | 2 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 |
| C404.2 | 2.4 | 2 | 2 | 2 | 1.8 | - | - | - | - | - | - | - | 2.2 | 2.2 | 1.2 |

| | |
|--------------------|--|
| Course Name | Micro-Electro-Mechanical Systems (MEMS) |
| Course Code | 15ECT743 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C404.3.1 | Describe new applications and directions of modern engineering. |
| C404.3.2 | Describe the techniques for building microdevices in silicon, polymer, metal and other materials. |
| C404.3.3 | Describe the physical, chemical, biological, and engineering principles involved in the design and operation of current and future microdevices. |
| C404.3.4 | Analyze microsystems technology for technical feasibility as well as practicality. |
| C404.3.5 | Describe the limitations and current challenges in microsystems technology. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C404.3.1 | 3 | 1 | 2 | 2 | - | | | - | - | - | - | - | 2 | 2 | 1 |
| C404.3.2 | 2 | 2 | - | 1 | 1 | | | - | - | - | - | - | 2 | 1 | 1 |
| C404.3.3 | 2 | 1 | 3 | 2 | - | 1 | | - | - | - | 2 | - | 2 | 2 | 1 |
| C404.3.4 | 3 | 2 | 2 | 2 | 2 | | | - | - | - | - | - | 3 | 2 | 2 |
| C404.3.5 | 2 | 1 | 1 | 3 | 3 | | | - | - | - | 1 | - | 2 | 1 | 1 |
| C404.3 | 2.4 | 1.4 | 2 | 2 | 2 | 1 | | | | | 1.5 | | 2.2 | 1.6 | 1.2 |

| | |
|--------------------|---|
| Course Name | Advanced Java with Full-stack (IC) |
| Course Code | 15ECT744 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C404.4.1 | Understand the programming concepts. |
| C404.4.2 | Understand the Design interfacing modules to communicate with external world |
| C404.4.3 | Understand the Differentiate the addressing modes and instruction set to perform - arithmetic & Understand the logic operations, data & control transfer operations, input & output operations |
| C404.4.4 | Understand the Describing the java full-stack data types and developing java programs & Development software. |
| C404.4.5 | |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| COs | | | | | | | | | | | | | | | |
| C404.4.1 | 2 | 2 | 2 | 3 | 2 | 2 | | - | 2 | 1 | 1 | 2 | 2 | 2 | 2 |
| C404.4.2 | 2 | 3 | 1 | 2 | 3 | 1 | | - | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| C404.4.3 | 3 | 2 | 2 | 2 | 3 | 2 | | - | 3 | 1 | 2 | 2 | 2 | 3 | 2 |
| C404.4.4 | 2 | 2 | 1 | 3 | 3 | 1 | | - | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| C404.4.5 | 3 | 1 | 2 | 3 | 1 | 2 | | - | 3 | 1 | 1 | 2 | 2 | 1 | 1 |
| C404.4 | 2.4 | 2 | 1.6 | 2.6 | 2.4 | 1.6 | | | 2.4 | 1 | 1.2 | 1.6 | 2 | 2 | 1.4 |

| | |
|--------------------|-----------------------|
| Course Name | Tax Management |
| Course Code | 15HOE751 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C405.1.1 | Gain knowledge about the system of taxation prevailing in the country. |
| C405.1.2 | Compute tax under different heads. |
| C405.1.3 | Gain practical knowledge on filing returns. |
| C405.1.4 | Calculate the payable tax for salaried individuals. |
| C405.1.5 | Gain insight into recent practices on taxation. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|------|------|-----|-----|-----|------|------|------|------|------|------|
| C405.1.1 | - | 3 | 2 | 3 | - | | | - | - | - | 1 | 1 | 1 | - | 1 |
| C405.1.2 | - | 1 | 2 | 3 | - | | | - | - | - | 2 | 2 | - | - | - |
| C405.1.3 | 1 | 3 | 2 | 2 | 1 | 2 | | - | - | - | 2 | 2 | - | - | 2 |
| C405.1.4 | - | 2 | 2 | 1 | 2 | 2 | | - | - | - | 1 | 3 | 1 | 1 | - |
| C405.1.5 | - | 2 | 1 | 2 | 2 | 1 | | - | - | - | 1 | 3 | 1 | 1 | 1 |
| C405.1 | 1 | 2.2 | 1.8 | 2.2 | 1.67 | 1.67 | | | | | 1.4 | 2.2 | 1 | 1 | 1.25 |

| | |
|--------------------|--|
| Course Name | Assessment of Building Energy Performance |
| Course Code | 15HOE752 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C405.2.1 | Produce an ASHRAE Building EQ In Operation rating for the buildings provided in the class |
| C405.2.2 | Produce a listing of potential Energy Efficiency Measures (EEM) including financial payback analysis |
| C405.2.3 | Perform measurements of indoor environmental quality and HVAC system performance |
| C405.2.4 | Identify different building types and determine the impact of climate on energy use. |
| C405.2.5 | Analyze raw energy consumption data from measured-meter readings |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C405.2.1 | 1 | | | | 1 | - | 1 | 1 | - | - | 1 | - | 1 | - | 1 |
| C405.2.2 | 1 | | | | - | 1 | 2 | - | - | - | 2 | - | - | - | - |
| C405.2.3 | 1 | | | | - | 1 | 1 | - | - | - | 2 | - | - | - | 2 |
| C405.2.4 | 1 | | | | 1 | 1 | 1 | - | - | - | 1 | - | 1 | 1 | - |
| C405.2.5 | 1 | | | | 1 | 1 | 1 | - | - | - | 1 | - | 1 | 1 | 1 |
| C405.2 | 1 | | | | 1 | 1 | 1.2 | 1 | | | 1.4 | | 1 | 1 | 1.25 |

| | |
|--------------------|---|
| Course Name | Natural Disaster Mitigation and Management |
| Course Code | 15HOE753 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C405.3.1 | Learn about the types of natural and environmental disasters and its causes. |
| C405.3.2 | Learn about organizational and Administrative strategies for managing disasters. |
| C405.3.3 | Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation. |
| C405.3.4 | Learn methodologies for disaster risk assessment with the help of latest tools like GPS, GIS, Remote sensing, information technologies, etc. |
| C405.3.5 | Understand the key roles of capacity building to face disaster among government bodies, institutions, NGO's, etc. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| COs | | | | | | | | | | | | | | | |
| C405.3.1 | | | | | | | | - | - | - | - | - | 1 | - | 1 |
| C405.3.2 | | | | | | | | - | - | - | - | - | - | - | - |
| C405.3.3 | | | | | | | | - | - | - | 2 | - | - | - | 2 |
| C405.3.4 | | | | | | | | - | - | - | - | - | 1 | 1 | - |
| C405.3.5 | | | | | | | | - | - | - | 1 | - | 1 | 1 | 1 |
| C405.3 | | | | | | | | | | | | | 1 | 1 | 1.25 |

| | |
|--------------------|---|
| Course Name | Small and Medium Enterprise Management |
| Course Code | 15HOE761 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C406.1.1 | Visualize the various concepts of Entrepreneurship and understand of current environment of MSMEs. |
| C406.1.2 | Know the Business Environment with respect to MSMEs. |
| C406.1.3 | Know the Process of Enterprise Creation. |
| C406.1.4 | Prepare Business Plan and Understand the Institutional Support Mechanism. |
| C406.1.5 | Know the marketing management with reference to MSMEs. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C406.1.1 | | | | | | 3 | 2 | - | - | - | - | - | 1 | - | 1 |
| C406.1.2 | | | | | | 3 | 2 | - | - | - | - | - | - | - | - |
| C406.1.3 | | | | | | 3 | 1 | - | - | - | 2 | - | - | - | 2 |
| C406.1.4 | | | | | | 3 | 1 | - | - | - | - | - | 1 | 1 | - |
| C406.1.5 | | | | | | 2 | 2 | - | - | - | 1 | - | 1 | 1 | 1 |
| C406.1 | | | | | | 2.8 | 1.6 | | | | 1.5 | | 1 | 1 | 1.25 |

| | |
|--------------------|--|
| Course Name | Occupational Safety and Health Administration |
| Course Code | 15HOE762 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C406.2.1 | Develop the ability to know the occupational health and safety. |
| C406.2.2 | Have the knowledge of the socio-economic aspects of occupational health and safety. |
| C406.2.3 | Demonstrate purpose of health screening measures. |
| C406.2.4 | Know the legal Provisions on Occupational Health and Safety. |
| C406.2.5 | Participate in Research and Occupational Health. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C406.2.1 | | | | | | | | - | - | - | - | - | 1 | - | 1 |
| C406.2.2 | | | | | | | | - | - | - | - | - | - | - | - |
| C406.2.3 | | | | | | | | - | - | - | 2 | - | - | - | 2 |
| C406.2.4 | | | | | | | | - | - | - | - | - | 1 | 1 | - |
| C406.2.5 | | | | | | | | - | - | - | 1 | - | 1 | 1 | 1 |
| C406.2 | | | | | | | | | | | | | 1 | 1 | 1.25 |

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|--------------------|---|
| Course Name | Animation and Multimedia Engineering |
| Course Code | 15HOE763 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C406.3.1 | Recognize the basics of animation along the tools. |
| C406.3.2 | Develop characters with computer animation. |
| C406.3.3 | Develop 3D drawings of characters and acquire skills regarding basic level of sketching. |
| C406.3.4 | Explain Foreshortening, Facial expressions. |
| C406.3.5 | Develop small animation characters by using acting and sketching techniques. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C406.3.1 | 3 | 1 | 1 | - | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C406.3.2 | 2 | 1 | 2 | - | 2 | - | - | - | - | - | - | - | 1 | 2 | - |
| C406.3.3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | - | 2 | 1 | 2 |
| C406.3.4 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 | - |
| C406.3.5 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C406.3 | 2 | 1.2 | 1.2 | | 2 | | | | | | 1.5 | | 1.8 | 1.6 | 1.25 |

| | |
|--------------------|------------------------------|
| Course Name | Power Electronics Lab |
| Course Code | 15ECL77 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C407.1 | Understand the fundamental concepts of MOSFET, IGBT and SCR. |
| C407.2 | Understand the basics of UJT HWR and FWR. |
| C407.3 | Discuss UJT triggering of SCR. |
| C407.4 | Understand Stepper motor concepts. |
| C407.5 | Describe various types of inverters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C407.1 | 3 | 1 | 1 | 1 | 2 | 1 | - | - | - | - | 2 | - | 2 | 2 | 1 |
| C407.2 | 3 | 2 | 1 | 1 | 2 | 1 | - | - | - | - | 1 | - | 3 | 2 | 1 |
| C407.3 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 |
| C407.4 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | 2 | - | 2 | 2 | 2 |
| C407.5 | 3 | 2 | 2 | 2 | 1 | - | 2 | - | - | - | 2 | - | 2 | 1 | 1 |
| C407 | 3 | 1.6 | 1.4 | 1.2 | 1.4 | 1 | 1.5 | - | - | - | 1.8 | - | 2.2 | 1.6 | 1.2 |

| | |
|--------------------|-------------------------------|
| Course Name | Data Communication Lab |
| Course Code | 15ECL78 |
| Semester | VII |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C408.1 | Understand different data stuffing techniques used in communication. |
| C408.2 | Analyze basic encryption techniques. |
| C408.3 | Discuss spanning tree. |
| C408.4 | Understand serial communication techniques. |
| C408.5 | Describe telnet basics and remote access. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C408.1 | 3 | 2 | 1 | 1 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| C408.2 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 1 | 3 | 2 | 1 |
| C408.3 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| C408.4 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| C408.5 | 2 | 3 | 3 | 2 | 3 | - | - | - | 2 | 2 | 2 | 3 | 2 | 1 | 1 |
| C408 | 2.2 | 2.8 | 2 | 1.8 | 3 | | | | 2 | 2 | 2 | 2 | 2.2 | 1.6 | 1.2 |

| | |
|--------------------|------------------------------------|
| Course Name | Project Phase-I and Seminar |
| Course Code | 15ECP79 |
| Semester | VII |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C409.1 | Demonstrate proficient knowledge on the concepts involved. |
| C409.2 | . Identify the problem and propose the possible solution through literature survey |
| C409.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C409.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C409.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| C0 | P O 1 | PO2 | PO3 | PO4 | P O 5 | PO6 | PO7 | PO8 | PO9 | P010 | P01 1 | PO12 | PS01 | PS02 | PSO 3 |
|---------------|-------------|-----|-----|-----|-------------|-----|-----|-----|-----|------|----------|------|------|------|----------|
| C409.1 | 3 | 2 | - | - | | | | | 2 | 3 | | 1 | 1 | 2 | 2 |
| C409.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C409.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C409.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C409.5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C409 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | | 1 | 1.8 | 1.8 | 1.6 |

| | |
|--------------------|-------------------------------------|
| Course Name | Project Phase-II and Seminar |
| Course Code | 15ECP81 |
| Semester | VIII |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C410.1 | Demonstrate proficient knowledge on the concepts involved. |
| C410.2 | . Identify the problem and propose the possible solution through literature survey |
| C410.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C410.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C410.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| C0 | PO1 | PO2 | PO3 | PO4 | P O 5 | PO6 | PO7 | PO8 | PO9 | P010 | P011 | PO12 | PS01 | PS02 | PSO3 |
|--------------------|-----|-----|-----|-----|-------------|-----|-----|-----|-----|------|------|------|------|------|------|
| C41 0.1 | 3 | 2 | - | - | | | | | 2 | 3 | | 1 | 1 | 2 | 2 |
| C41 0.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C41 0.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C41 0.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C41 0.5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C41 0 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | | 1 | 1.8 | 1.8 | 1.6 |

| | |
|--------------------|--------------------------------------|
| Course Name | Project Phase-III and Seminar |
| Course Code | 15ECP82 |
| Semester | VIII |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C411.1 | Demonstrate proficient knowledge on the concepts involved. |
| C411.2 | . Identify the problem and propose the possible solution through literature survey |
| C411.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C411.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C411.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| C0 | PO1 | PO2 | PO3 | PO4 | P O 5 | PO6 | PO7 | PO8 | PO9 | P010 | P01 1 | PO12 | PS01 | PS02 | PSO 3 |
|--------------------|-----|-----|-----|-----|-------------|-----|-----|-----|-----|------|----------|------|------|------|----------|
| C41 1.1 | 3 | 2 | - | - | | | | | 2 | 3 | | 1 | 1 | 2 | 2 |
| C41 1.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C41 1.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C41 1.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C41 1.5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C41 1 | 3 | 2.2 | 2.3 | 1.3 | 2. 5 | 1.5 | 1.5 | 1 | 2.6 | 2 | | 1 | 1.8 | 1.8 | 1.6 |

| | |
|--------------------|---------------------------------|
| Course Name | Evaluation and Viva-voce |
| Course Code | 15ECP83 |
| Semester | VIII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C412.1 | Demonstrate proficient knowledge on the concepts involved. |
| C412.2 | Identify the problem and propose the possible solution through literature survey |
| C412.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C412.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C412.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| C0 | PO1 | PO2 | PO3 | PO4 | P O5 | PO6 | PO7 | PO8 | PO9 | P010 | P011 | PO12 | PS01 | PS02 | PSO3 |
|--------------------|-----|-----|-----|-----|---------|-----|-----|-----|-----|------|------|------|------|------|------|
| C412 .1 | 3 | 2 | - | - | | | | | 2 | 3 | | 1 | 1 | 2 | 2 |
| C412 .2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C412 .3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C412 .4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C412 .5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C412 | 3 | 2.2 | 2.3 | 1.3 | 2. 5 | 1.5 | 1.5 | 1 | 2.6 | 2 | | 1 | 1.8 | 1.8 | 1.6 |

Nagarjuna College of Engineering and Technology

Department of Electronics and Communication Engineering

2016 Scheme

| | |
|-------------|----------------------------------|
| Course Name | Engineering Mathematics-III (IC) |
| Course Code | 16ECM31 |
| Semester | III |

| CO. No. | Statements On completion of this course, students will be able to: |
|---------|---|
| C201.1 | Form partial differential equations and their solutions. |
| C201.2 | Expressing the given functions as infinite series of sine and cosine. |
| C201.3 | Apply Fourier and Z-Transform to different problems |
| C201.4 | Find approximated solutions by numerical methods |
| C201.5 | Use the SCILAB to solve the various types engineering problem |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C201.1 | 2 | 2 | 1 | 1 | 1 | 2 | - | - | - | - | - | | 3 | 3 | 1 |
| C201.2 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | | 2 | 2 | 1 |
| C201.3 | 2 | 1 | 2 | 1 | 1 | 2 | - | - | - | - | - | | 3 | 2 | 2 |
| C201.4 | 2 | 1 | 2 | 1 | 1 | 1 | - | - | - | - | - | | 2 | 1 | 1 |
| C201.5 | 2 | 1 | 1 | 2 | 1 | 2 | | - | - | - | | - | 2 | 2 | 1 |
| C201 | 2 | 1.2 | 1.4 | 1.2 | 1 | 1.6 | | | | | | | 2.4 | 2 | 1.2 |

| | |
|--------------------|-----------------------------------|
| Course Name | Analog Electronic Circuits |
| Course Code | 16ECT32 |
| Semester | III |

| CO. No. | Statements On completion of this course, students will be able to: |
|----------------|---|
| C202.1 | Design rectifiers, clipping and clamping circuits. |
| C202.2 | Analyze different ways of biasing transistors. |
| C202.3 | Evaluate transistor frequency response. |
| C202.4 | Design of simple amplifier and power amplifies circuits. |
| C202.5 | Analyze different type's oscillator circuits for particular frequencies. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C202.1 | 3 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C202.2 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C202.3 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | 3 | 2 |
| C202.4 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 2 |
| C202.5 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 1 | 2 | 2 |
| C202 | 3 | 3 | 3 | 2.2 | 1.8 | - | - | - | - | - | - | 1.4 | 2 | 2.2 | 1.6 |

| | |
|--------------------|---------------------|
| Course Name | Logic Design |
| Course Code | 16ECT33 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C203.1 | Design an optimal solution for a given digital problems using K- Maps. |
| C203.2 | Design combinational digital circuits for the given specifications. |
| C203.3 | Describe the different types of Flip-Flops. |
| C203.4 | Design sequential digital circuits for given specifications. |
| C203.5 | Develop the appropriate Mealy FSM or Moore FSM. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C203.1 | 2 | 3 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C203.2 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 | 2 |
| C203.3 | 1 | 2 | 3 | 1 | - | - | - | - | - | - | - | 1 | 2 | 3 | 3 |
| C203.4 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | 3 | 3 |
| C203.5 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 1 | 3 | 3 |
| C203 | 1.4 | 2.4 | 2.4 | 1.6 | - | - | - | - | - | - | - | 1.75 | 2 | 2.6 | 2.4 |

| | |
|--------------------|---------------------|
| Course Name | Field Theory |
| Course Code | 16ECT34 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C204.1 | Describe the basics of vectors, coordinate systems and electrostatics. |
| C204.2 | Discuss the concepts of energy and potential for the boundary conditions. |
| C204.3 | Analyze basic theory of Poisson's and Laplace's equations. |
| C204.4 | Apply the laws and theorems governing magnetic field |
| C204.5 | Apply the Maxwell's equations and relationship between maxwell's equations and uniform plane wave. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|------|------|------|
| C204.1 | 2 | 3 | - | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C204.2 | 2 | 3 | 2 | 2 | - | 1 | - | - | - | - | - | - | 2 | 3 | 2 |
| C204.3 | 2 | 1 | 2 | 3 | - | 1 | - | - | - | - | 2 | - | 3 | 3 | 1 |
| C204.4 | 2 | 3 | 3 | 1 | - | 2 | - | - | - | - | - | - | 2 | 2 | 1 |
| C204.5 | 2 | 2 | 3 | 2 | 2 | - | 2 | - | - | - | - | 2 | 1 | 1 | 2 |
| C204 | 2 | 2.4 | 2.5 | 1.8 | 2 | 1.33 | 2 | - | - | - | - | 2 | 2 | 2.2 | 1.4 |

| | |
|--------------------|------------------------------|
| Course Name | Network Analysis (IC) |
| Course Code | 16ECI35 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C205.1 | Analyze the concepts of loop and nodal analysis to various electrical circuits |
| C205.2 | Evaluate circuits using network topology. |
| C205.3 | Design various network theorems to simplify circuits. |
| C205.4 | Design resonant circuit modules and analyze the transient behavior of RLC circuits |
| C205.5 | Analyze the circuits using two port parameters |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|------|------|------|
| C205.1 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| C205.2 | 2 | 3 | 3 | 2 | - | - | - | - | 1 | - | - | - | 2 | 3 | 1 |
| C205.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 3 | 2 |
| C205.4 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 1 | 3 | 1 |
| C205.5 | 2 | 2 | 3 | 3 | 1 | 1 | - | - | - | 1 | 1 | - | 2 | 3 | 2 |
| C205 | 2 | 2.4 | 2.5 | 1.8 | 2 | 1.33 | 2 | | | | 2 | 2 | 2 | 2.8 | 1.4 |

| | |
|--------------------|---|
| Course Name | Computer Communication and Networking (IC) |
| Course Code | 16ECI361 |
| Semester | III |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C206.1.1 | Describe the basics of data communication system and network models. |
| C206.1.2 | Distinguish between different techniques of digital transmissions. |
| C206.1.3 | Compare different methods of analog transmissions. |
| C206.1.4 | Explain various types of multiplexing and spread spectrum mechanisms. |
| C206.1.5 | Solve problems of error detection and correction using Block coding and CRC mechanisms. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PS O3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|----------|
| C206.1.1 | 3 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 1 |
| C206.1.2 | 2 | 3 | 3 | 1 | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| C206.1.3 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 2 |
| C206.1.4 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | 1 | 1 |
| C206.1.5 | 2 | 2 | 3 | 2 | 2 | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C206.1 | 2.2 | 2 | 2.2 | 1.4 | 2 | | | | | | 1 | | 2.2 | 2 | 1.2 |

| | |
|-------------|--|
| Course Name | Creating Interactive and Responsive Web Pages (IC) |
| Course Code | 16ECI362 |
| Semester | III |

| CO. No. | Statements |
|----------|---|
| | On completion of this course, students will be able to: |
| C206.2.1 | Develop web layouts with style sheets and web screens in a presentable form. |
| C206.2.2 | Write interactive web pages through form validations and other methods. Use the same in UI development. |
| C206.2.3 | Use the Java Script libraries to accelerate UI development. |
| C206.2.4 | Design and develop responsive and mobile first web pages. |
| C206.2.5 | Develop applications by using synchronous and asynchronous communication over web. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C206.2.1 | 1 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C206.2.2 | 2 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| C206.2.3 | 2 | 3 | 2 | 1 | 2 | - | - | - | - | - | 2 | - | 1 | 3 | 1 |
| C206.2.4 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C206.2.5 | 1 | 1 | 2 | 2 | - | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C206.2 | 1.6 | 1.8 | 2 | 1.4 | 2 | | | | | | 1.5 | | 1.8 | 2.2 | 1.2 |

| | |
|--------------------|--|
| Course Name | Electronic Instrumentation (IC) |
| Course Code | 16ECI363 |
| Semester | III |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C206.3.1 | Analyze characteristics of various measuring instruments and different types of errors. |
| C206.3.2 | Describe the different current and voltage meters. |
| C206.3.3 | Use the CRO and able to measure different parameters. |
| C206.3.4 | Use Signal generators and function generator |
| C206.3.5 | Describe the working of different types of Transducers. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C206.3.1 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C206.3.2 | 2 | 3 | 1 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| C206.3.3 | 3 | 2 | 1 | 3 | - | - | - | - | - | - | 2 | - | 1 | 3 | 1 |
| C206.3.4 | 2 | 2 | 2 | 2 | | | | - | - | - | - | - | 2 | 2 | 1 |
| C206.3.5 | 3 | 1 | 2 | 3 | 1 | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C206.3 | 2.6 | 2 | 1.6 | 2.2 | 1.5 | | | | | | 1.5 | | 1.8 | 2.2 | 1.2 |

| | |
|-------------|--|
| Course Name | Analog Electronics Circuits Laboratory |
| Course Code | 16ECL37 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C207.1 | Design various types of clipping and clamping circuits. |
| C207.2 | Analyze and design different rectifiers. |
| C207.3 | Design BJT amplifier and power amplifier. |
| C207.4 | Design and evaluate Darlington emitter follower. |
| C207.5 | Design and evaluate the performance of various types of oscillators. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| C207.1 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | - | 2 | 1 | 2 | 3 | 1 |
| C207.2 | 2 | 2 | 2 | 3 | | - | - | - | 2 | - | 2 | 2 | 2 | 3 | 2 |
| C207.3 | 2 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | 1 | 2 | 3 | 1 |
| C207.4 | 2 | 2 | 1 | 2 | 3 | - | - | - | 2 | - | 2 | 1 | 2 | 3 | 1 |
| C207.5 | 2 | 1 | 2 | 2 | 1 | - | - | - | 2 | - | 1 | 2 | 2 | 3 | 1 |
| C207 | 2.2 | 2 | 2.2 | 2.2 | 1.75 | | | | 2 | | 1.8 | 1.4 | 2 | 3 | 1.2 |

| | |
|--------------------|--------------------------------|
| Course Name | Logic Design Laboratory |
| Course Code | 16ECL38 |
| Semester | III |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C208.1 | Design and analyze simple Boolean expression using basic gates. |
| C208.2 | Design and verification of various Combinational Circuits. |
| C208.3 | Analyze practical application of decoder chip and priority encoder. |
| C208.4 | Evaluate the various Sequential Circuits. |
| C208.5 | Design and analyze various types of registers and counters. |

| POS COs | P O 1 | PO 2 | PO 3 | PO 4 | P O 5 | PO6 | PO 7 | PO8 | PO 9 | PO1 0 | PO11 | PO 12 | PSO 1 | PSO2 | PSO3 |
|---------------|-------------|---------|---------|---------|-------------|-----|---------|-----|---------|----------|------|----------|----------|------|------|
| C208.1 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 2 | 1 |
| C208.2 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 3 | 1 |
| C208.3 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 1 | 3 | 2 |
| C208.4 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 1 | 2 |
| C208.5 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 2 | 2 |
| C208 | 1 | 2 | 3 | 3 | 3 | | | | 3 | 2 | 2 | | 1.8 | 2.2 | 1.6 |

| | |
|--------------------|--|
| Course Name | Integrated Rural Development – Part 1 |
| Course Code | 16ECH39 |
| Semester | III |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C209.1 | Develop the ability to interact and communicate with different sections of society thus improving their communication skills |
| C209.2 | Understand the existing problems and needs of a village, thus |
| C209.3 | Conceptualize plan realize measures to address these problems, thus improving their partial problem solving and leadership skills |
| C209.4 | Make an impact to rural section of society, thus building their self confidence |

| POS COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO1 0 | PO1 1 | P O1 2 | PS O1 | PSO 2 | PSO3 |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|-----------------------|------------------|------------------|-------------|
| C209.1 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| C209.2 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| C209.3 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| C209.4 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| C209 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1.7 5 | 1.75 | 1 |

| | |
|-------------|---------------------------------|
| Course Name | Engineering Mathematics-IV (IC) |
| Course Code | 16ECM41 |
| Semester | IV |

| CO. No. | Statements |
|---------|--|
| | On completion of this course, students will be able to: |
| C210.1 | Determine the Differentiation, Integration using numerical methods. |
| C210.2 | Solve the differentiation and integrals of complex functions. |
| C210.3 | Find the differentiation and integrals of complex functions |
| C210.4 | Find the probability using different distributions and analysis by using samplings |
| C210.5 | Use the statistical software's. |

| POS COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO1 0 | PO1 1 | PO 12 | PSO 1 | PSO2 | P S O 3 |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|------|------------------|
| C210.1 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 3 | 3 | 1 |
| C210.2 | 2 | 3 | 2 | 1 | 2 | | | - | - | - | - | - | 2 | 2 | 1 |
| C210.3 | 2 | 3 | 2 | 1 | 1 | | | - | - | - | 2 | - | 3 | 2 | 2 |
| C210.4 | 3 | 3 | 3 | 1 | 3 | | | - | - | - | 3 | - | 2 | 1 | 1 |
| C210.5 | 2 | 3 | 3 | 1 | 2 | | | - | - | - | 1 | - | 2 | 2 | 1 |
| C210 | 2.2 | 3 | 2.4 | 1 | 1.8 | | | | | | 2 | | 2.4 | 2 | 1. 2 |

| | |
|--------------------|-----------------------|
| Course Name | Microprocessor |
| Course Code | 16ECT42 |
| Semester | IV |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C211.1 | Describe the architecture of 8086. |
| C211.2 | Analyze the appropriate usage of instructions in programming. |
| C211.3 | Develop the interfacing programs with various interfaces. |
| C211.4 | Analyze the appropriate algorithms for solving problems in math coprocessor. |
| C211.5 | Distinguish various advanced processors. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C211.1 | 3 | 2 | 2 | - | 2 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |
| C211.2 | 2 | 2 | - | - | - | 2 | 1 | - | - | - | 2 | 2 | 2 | 3 | 2 |
| C211.3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | - | - | - | 2 | 2 | 3 | 1 | 1 |
| C211.4 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 |
| C211.5 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 1 | 1 | 1 |
| C211 | 2.8 | 2.4 | 2.75 | 3 | 2.5 | 2.4 | 2 | | | 2 | 2 | 2.2 | 2 | 1.8 | 1.6 |

| | |
|--------------------|----------------------------|
| Course Name | Fundamentals of HDL |
| Course Code | 16ECT43 |
| Semester | IV |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C212.1 | Describe the various descriptions in VHDL and Verilog. |
| C212.2 | Develop program using data flow and behavioral descriptions. |
| C212.3 | Develop program using structural and mixed language description. |
| C212.4 | Develop programs using procedure, task, and function. |
| C212.5 | Analyze and synthesis VHDL and VERILOG codes for digital circuits. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|------|------|------|------|
| C212.1 | 2 | 2 | 3 | 2 | - | - | | - | - | - | - | - | 2 | 2 | 1 |
| C212.2 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C212.3 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 2 | 1 | 1 |
| C212.4 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C212.5 | 1 | 2 | 3 | 1 | 2 | | | - | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| C212 | 1.2 | 2 | 3 | 1.8 | 2.75 | | | | 2.75 | 2 | 1 | 1 | 1.6 | 1.8 | 1 |

| | |
|--------------------|----------------------------|
| Course Name | Signals and Systems |
| Course Code | 16ECT44 |
| Semester | IV |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C213.1 | Discriminate various elementary signals and identify the properties of systems. |
| C213.2 | Compute convolution operation on continuous and discrete time signals and express difference and differential equations as block diagram. |
| C213.3 | Express the signals using Fourier transform and apply their properties for solving differential and difference equation. |
| C213.4 | Analyze Z transforms and inverse Z transforms using various methods. |
| C213.5 | Analyze LTI systems using Z transforms. |

| POS COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO1 0 | PO1 1 | PO1 2 | PS O1 | PSO 2 | PS O3 |
|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|
| C213.1 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C213.2 | 2 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | 1 | 1 | 1 | 2 |
| C213.3 | 2 | 2 | 2 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 |
| C213.4 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | 3 | 1 | 1 |
| C213.5 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 1 |
| C213 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 1 |

| | |
|--------------------|--|
| Course Name | Linear Integrated Circuits (IC) |
| Course Code | 16ECI451 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C214.1.1 | Describe the practical OP-AMP specifications and characteristics. |
| C214.1.2 | Determine OP-AMP as AC amplifiers. |
| C214.1.3 | Analyzing stability condition of OP-AMP |
| C214.1.4 | Analyzing OP-AMP linear and nonlinear applications. |
| C214.1.5 | Analyzing of 555 timers, PLL and their applications. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C214.1.1 | 2 | 3 | 2 | 2 | 2 | 1 | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C214.1.2 | 1 | 2 | 2 | 2 | - | 2 | - | - | - | - | - | 2 | 1 | 1 | 2 |
| C214.1.3 | 2 | 3 | 2 | 1 | - | 2 | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C214.1.4 | 2 | 2 | 1 | 2 | 1 | 2 | - | - | - | - | - | 2 | 3 | 1 | 1 |
| C214.1.5 | 3 | 1 | 1 | 1 | - | 1 | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C214.1 | 2 | 2.2 | 1.6 | 1.6 | 1.5 | 1.6 | | | | | 2 | 2 | 2 | 1.4 | 1.2 |

| | |
|--------------------|----------------------------------|
| Course Name | Fundamentals of VLSI (IC) |
| Course Code | 16ECI452 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C214.2.1 | Describe the fabrication process and VLSI design flow. |
| C214.2.2 | Discuss V-I and C-V characteristics of MOSFETS. |
| C214.2.3 | Analyze sequential and combinational logic circuits using CMOS. |
| C214.2.4 | Discuss the concepts of testing and dynamic CMOS circuits. |
| C214.2.5 | Describe the concepts of low power VLSI design. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C214.2.1 | 2 | 2 | 1 | 1 | 3 | | | - | - | - | 3 | - | 2 | 2 | 1 |
| C214.2.2 | 2 | - | 1 | 1 | - | | | - | - | - | 2 | - | 1 | 2 | 1 |
| C214.2.3 | 1 | 3 | 3 | 2 | 2 | | | - | - | - | 2 | - | 2 | 1 | 1 |
| C214.2.4 | 2 | 3 | 3 | 2 | - | | | - | - | - | 3 | - | 1 | 2 | 1 |
| C214.2.5 | 2 | 1 | 1 | 1 | - | | | - | - | - | 1 | - | 2 | 2 | 1 |
| C214.2 | 1.8 | 2.25 | 1.8 | 1.4 | 2.5 | | | | | | 2.2 | | 1.6 | 1.8 | 1 |

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|--------------------|--|
| Course Name | Introduction to Programming using Python (IC) |
| Course Code | 16ECI453 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C214.3.1 | Apply the concepts of Object Oriented principles used in Python. |
| C214.3.2 | Apply Types, Type Operators and Built-in functions and use the same in developing specific programs. |
| C214.3.3 | Apply the usage of built-in libraries, creation of customized libraries and efficient ways to store and retrieve data. |
| C214.3.4 | Use file handling and exception handling mechanisms and apply the same in solving specific problems. |
| C214.3.5 | Apply techniques using regular expressions and apply the same in solving specific problems. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C214.3.1 | 2 | 1 | 2 | 1 | 3 | - | - | - | 2 | - | 3 | 2 | 2 | 2 | 1 |
| C214.3.2 | 2 | 2 | 2 | 3 | 2 | - | - | - | 1 | - | 2 | 3 | 3 | 2 | 1 |
| C214.3.3 | 2 | 2 | 3 | 2 | 1 | - | - | - | 2 | - | 2 | 2 | 2 | 3 | 1 |
| C214.3.4 | 3 | 2 | 3 | 2 | 2 | - | - | - | 2 | - | 3 | 2 | 2 | 2 | 1 |
| C214.3.5 | 3 | 3 | 3 | 2 | 2 | - | - | - | 3 | - | 3 | 2 | 1 | 3 | 2 |
| C214.3 | 2.4 | 2 | 2.6 | 2 | 2 | - | - | | 2 | | 2.6 | 2.2 | 2 | 2.4 | 1.2 |

| | |
|--------------------|-----------------------------------|
| Course Name | Renewable Energy Resources |
| Course Code | 16ECT461 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C215.1.1 | Explain the present energy scenario and the available Renewable Energy Resources. |
| C215.1.2 | Describe the basics of solar radiation geometry and various measurement techniques. |
| C215.1.3 | Analyze the knowledge gained in tapping the solar energy through solar thermal devices, pv conversion and their performance analysis. |
| C215.1.4 | Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal. |
| C215.1.5 | Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C215.1.1 | | | | | | | | - | - | - | - | - | | | |
| C215.1.2 | | | | | | | | - | - | - | - | - | | | |
| C215.1.3 | | | | | | | | - | - | - | 2 | - | | | |
| C215.1.4 | | | | | | | | - | - | - | - | - | | | |
| C215.1.5 | | | | | | | | - | - | - | 1 | - | | | |
| C215.1 | | | | | | | | | | | | | | | |

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|--------------------|---|
| Course Name | Object Oriented Programming with C++ |
| Course Code | 16ECT462 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C215.2.1 | Apply the concepts of ObjectOriented Programming. |
| C215.2.2 | Implement the concepts of classes and objects. |
| C215.2.3 | Apply the concepts of inheritance to solve complex problems. |
| C215.2.4 | Implement mechanism of virtual function and polymorphism. |
| C215.2.5 | Develop generic function to perform different operations on different data types and implement exception handling. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C215.2.1 | 3 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C215.2.2 | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 |
| C215.2.3 | 2 | 3 | 3 | 1 | 2 | - | - | - | - | - | 2 | - | 2 | 1 | 1 |
| C215.2.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C215.2.5 | 2 | 3 | 2 | 1 | 2 | - | - | - | - | - | 1 | - | 2 | 1 | 1 |
| C215.2 | 2.6 | 2.4 | 1.8 | 1.2 | 1.75 | - | - | - | - | - | 1.5 | - | 2.2 | 1.6 | 1.2 |

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|-------------|-----------------|
| Course Name | Smart Materials |
| Course Code | 16ECT463 |
| Semester | IV |

| CO. No. | Statements |
|----------|--|
| | On completion of this course, students will be able to: |
| C215.3.1 | Explain the characteristics of composites and smart materials in the product design process. |
| C215.3.2 | Identify various types of sensing and actuation devices. |
| C215.3.3 | Analyze the optics and design structures using smart materials. |
| C215.3.4 | Demonstrate the working principles of different control systems. |
| C215.3.5 | Describe the principles of vibration and modal analysis. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C215.3.1 | | | | | | | | - | - | - | - | - | | | |
| C215.3.2 | | | | | | | | - | - | - | - | - | | | |
| C215.3.3 | | | | | | | | - | - | - | 2 | - | | | |
| C215.3.4 | | | | | | | | - | - | - | - | - | | | |
| C215.3.5 | | | | | | | | - | - | - | 1 | - | | | |
| C215.3 | | | | | | | | | | | | | | | |

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|--------------------|---------------------------------------|
| Course Name | Management Information Systems |
| Course Code | 16ECT464 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C215.4.1 | Describe the roles and functionalities of information system. |
| C215.4.2 | Analyze types of solutions for business and its applications. |
| C215.4.3 | Analyze the usage of Intranet and Extranet in business applications. |
| C215.4.4 | Describe database management and competitive strategic approach of information systems in business applications. |
| C215.4.5 | Describe various approaches in managing information technology. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C215.4.1 | | | | | | | | - | - | - | - | - | | | |
| C215.4.2 | | | | | | | | - | - | - | - | - | | | |
| C215.4.3 | | | | | | | | - | - | - | - | - | | | |
| C215.4.4 | | | | | | | | - | - | - | - | - | | | |
| C215.4.5 | | | | | | | | - | - | - | - | - | | | |
| C215.4 | | | | | | | | | | | | | | | |

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|--------------------|-----------------------------------|
| Course Name | Microprocessors Laboratory |
| Course Code | 16ECL47 |
| Semester | IV |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C216.1 | Develop the program for data transfer. |
| C216.2 | Develop arithmetic logical and bit manipulation Assembly level programs. |
| C216.3 | Develop programs to understand branch and looping instruction. |
| C216.4 | Analyze the usage of appropriate interrupts in programming and interfacing. |
| C216.5 | Analyze and interface the peripherals using assembly level language. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C216.1 | 3 | 2 | 2 | 2 | 2 | - | - | - | 2 | - | 2 | 2 | 2 | 2 | 2 |
| C216.2 | 2 | 2 | 3 | 3 | 2 | - | - | - | 2 | - | 2 | 2 | 2 | 3 | 2 |
| C216.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | 3 | - | 3 | 2 | 3 | 1 | 1 |
| C216.4 | 2 | 2 | 3 | 2 | 2 | - | - | - | 2 | - | 2 | 2 | 2 | 2 | 2 |
| C216.5 | 2 | 3 | 3 | 3 | 2 | - | - | - | 2 | - | 3 | 2 | 1 | 1 | 1 |
| C216 | 2.2 | 2.4 | 2.6 | 2.4 | 2 | - | - | - | 2.2 | - | 2.4 | 2 | 2 | 1.8 | 1.6 |

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|--------------------|-----------------------|
| Course Name | HDL Laboratory |
| Course Code | 16ECL48 |
| Semester | IV |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C217.1 | Develop HDL programs for Logic gates. |
| C217.2 | Develop HDL programs for combinational designs. |
| C217.3 | Develop HDL programs for sequential designs. |
| C217.4 | Develop HDL programs for various counters. |
| C217.5 | Analyze and Interface with various electrical components. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C217.1 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C217.2 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C217.3 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 2 | 1 | 1 |
| C217.4 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| C217.5 | 1 | 2 | 3 | 1 | 2 | - | - | - | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| C217 | 1.2 | 2 | 3 | 1.8 | 2.8 | - | - | - | 2.75 | 2 | 1 | 1 | 1.6 | 1.8 | 1 |

| | |
|--------------------|--|
| Course Name | Integrated Rural Development – Part 2 |
| Course Code | 16ECH49 |
| Semester | IV |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C218.1 | Further develop their social and communication skills by interacting with residents of the village their team |
| C218.2 | Conceptualize long term solution to challenge in villages, thus developing a sense of entrepreneurship |
| C218.3 | Make an impact to rural section of society, thus building their self confidence |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C218.1 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| C218.2 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| C218.3 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| C218 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1.6 | 1.3 | 1.3 |

| | |
|--------------------|------------------------------|
| Course Name | Communication Systems |
| Course Code | 16ECT51 |
| Semester | V |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C301.1 | Determine the generation and demodulation of AM and DSBSC systems. |
| C301.2 | Understand the generation and demodulation of SSB, VSB and employ AM radio system. |
| C301.3 | Describe the direct and indirect method of generation of FM. |
| C301.4 | Evaluate the FM radio systems and its detection. |
| C301.5 | Analyze the noise performance of receivers. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|----------|----------|-----|-----|----------|----------|----------|------------|------------|------|------|------|
| C301.1 | 3 | 1 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C301.2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 3 | 2 |
| C301.3 | 2 | 1 | 3 | 2 | - | - | - | - | - | - | 2 | 1 | 2 | 2 | 1 |
| C301.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | 1 | 1 | 1 | 1 |
| C301.5 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 2 | 2 | 1 |
| C301 | 2.4 | 1.6 | 1.8 | 2 | 2 | - | - | - | - | - | 1.5 | 1.4 | 2 | 2 | 1.2 |

| | |
|--------------------|-------------------------|
| Course Name | Microcontrollers |
| Course Code | 16ECT52 |
| Semester | V |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C302.1 | Solve basic binary math operations using the microcontroller. |
| C302.2 | Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target Microcontroller. |
| C302.3 | Analyze program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program. |
| C302.4 | Apply knowledge of the microcontroller's internal registers and operations by use of a PC based microprocessor Simulator and write assemble assembly language programs. |
| C302.5 | Design electrical circuitry to the microcontroller I/O ports in order to interface the processor to external devices. |

| POS COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | P O 6 | PO 7 | PO 8 | PO9 | PO1 0 | PO1 1 | PO1 2 | PSO 1 | PSO 2 | PSO 3 |
|---------------|---------|---------|---------|---------|---------|-------------|---------|---------|-----|----------|----------|----------|----------|----------|----------|
| C302.1 | 3 | 2 | 3 | 1 | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C302.2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | 2 | 2 | 3 | 1 | 1 |
| C302.3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C302.4 | 3 | 2 | 2 | 3 | 1 | - | - | - | - | - | 2 | 2 | 3 | 2 | 2 |
| C302.5 | 3 | 1 | 3 | 3 | 2 | - | - | - | - | - | 3 | 2 | 3 | 2 | 1 |
| C302 | 2.8 | 1.6 | 2.6 | 2 | 1.33 | - | - | - | - | - | 2.2 | 2 | 2 | 1.6 | 1.2 |

| | |
|--------------------|--------------------------------------|
| Course Name | Information Theory and Coding |
| Course Code | 16ECT53 |
| Semester | V |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C303.1 | Compute entropy and information rate of a source. |
| C303.2 | Encode the source output using encoding algorithms and coding techniques. |
| C303.3 | Determine the channel capacity of different channels and also the mutual information |
| C303.4 | Implement the error control coding, methods of controlling errors and Error correction and detection. |
| C303.5 | Encode using bit shift register, syndrome calculate and complete knowledge of BCH and burst error correcting codes. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C303.1 | 3 | 3 | 2 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 3 | 2 | 1 |
| C303.2 | 3 | 3 | 3 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 2 | 3 | 1 |
| C303.3 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 3 | 3 | 1 |
| C303.4 | 3 | 3 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 3 | 1 |
| C303.5 | 3 | 3 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 3 | 3 | 2 |
| C303 | 3 | 2.8 | 2.2 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 2.6 | 2.8 | 1.2 |

| | |
|-------------|----------------------|
| Course Name | Control Systems (IC) |
| Course Code | 16ECI541 |
| Semester | V |

| CO. No. | Statements |
|----------|---|
| | On completion of this course, students will be able to: |
| C304.1.1 | Employ mathematical modelling techniques to determine the transfer function of a given system. |
| C304.1.2 | Analyze the time response of first and second order systems for different test input signals. |
| C304.1.3 | Apply the concept of RH criterion and Nyquist criterion to determine the stability of a given transfer functions. |
| C304.1.4 | Interpret the concept of root locus to determine the stability of a given transfer function. |
| C304.1.5 | Know the frequency domain specification fundamentals and sketch a Bode plot to analyze Stability of a given systems and able to write state model for the given system. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C304.1.1 | 3 | 3 | 2 | 2 | - | 1 | - | - | - | - | - | 1 | 3 | 2 | 1 |
| C304.1.2 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 2 | 2 | 2 | 3 | 1 |
| C304.1.3 | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | 1 | 1 | 3 | 3 | 1 |
| C304.1.4 | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | 1 | 1 | 2 | 3 | 1 |
| C304.1.5 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 3 | 3 | 2 |
| C304.1 | 2.6 | 2.2 | 2.4 | 2.4 | 2 | 1 | - | - | - | | 1.25 | 1.2 | 2.6 | 2.8 | 1.2 |

| | |
|-------------|----------------------------|
| Course Name | Low Power VLSI Design (IC) |
| Course Code | 16ECI542 |
| Semester | V |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C304.2.1 | Distinguish between different types of MOSFET devices. |
| C304.2.2 | Analyze different principles of low power VLSI design |
| C304.2.3 | Apply the concept of transistor sizing for synthesis of low power. |
| C304.2.4 | Design and test of low-voltage CMOS circuits |
| C304.2.5 | Estimate the power consumption of VLSI circuits & optimize it |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C304.2.1 | 2 | 1 | 2 | 3 | - | - | - | - | - | - | 2 | 1 | 3 | 2 | 1 |
| C304.2.2 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C304.2.3 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | 2 | 1 | 3 | 3 | 1 |
| C304.2.4 | 2 | 2 | 3 | 3 | - | - | - | - | - | - | 2 | 1 | 2 | 1 | 1 |
| C304.2.5 | 3 | 2 | 2 | 3 | - | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| C304.2 | 2.4 | 1.8 | 1.8 | 2.4 | - | - | - | ! | ! | ! | 2.2 | 1.4 | 2.4 | 2 | 1.2 |

| | |
|-------------|---------------------------|
| Course Name | Microwaves and RADAR (IC) |
| Course Code | 16ECI543 |
| Semester | V |

| CO. No. | Statements |
|----------|--|
| | On completion of this course, students will be able to: |
| C304.3.1 | Define line parameters and analyze various transmission lines and resonators. |
| C304.3.2 | Understand the basic concepts of diodes and its applications. |
| C304.3.3 | Apply the concepts of S parameters to analyze waveguide Tees. |
| C304.3.4 | Analyze the differences between various strip lines and its applications |
| C304.3.5 | Apply the concepts of RADAR to find range of the target object and velocity of the target. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C304.3.1 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 2 |
| C304.3.2 | 3 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | 2 | 1 |
| C304.3.3 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | 2 | 2 | 2 | 3 | 2 |
| C304.3.4 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| C304.3.5 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 3 | 1 |
| C304.3 | 2.8 | 2.4 | 2.2 | 2.4 | 2 | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.4 | 2 | 2.4 | 1.4 |

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|-------------|--|
| Course Name | Digital System Design using Verilog (IC) |
| Course Code | 16ECI551 |
| Semester | V |

| CO. No. | Statements |
|----------|--|
| | On completion of this course, students will be able to: |
| C305.1.1 | Analyze and verify various combinational circuits. |
| C305.1.2 | Discuss number basics and sequential basics in Verilog. |
| C305.1.3 | Analyze the appropriate usage of instructions and data types. |
| C305.1.4 | Analyze various I/O interfacings and software. |
| C305.1.5 | Describe and verify accelerators and design methodologies. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C305.1.1 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 3 | 2 | 1 |
| C305.1.2 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 1 | 2 | 2 | 1 |
| C305.1.3 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C305.1.4 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C305.1.5 | 2 | 1 | 2 | 3 | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 |
| C305.1 | 2 | 2.2 | 2.6 | 2.2 | 2.4 | - | - | - | - | - | 2 | 1.8 | 2.4 | 2 | 1.2 |

| | |
|-------------|---------------------------------------|
| Course Name | Object Oriented Programming with JAVA |
| Course Code | 16ECI552 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C305.2.1 | Explain the basic concepts of Java Technology and its features. |
| C305.2.2 | Explain the OOPs concepts. |
| C305.2.3 | Write programs in Java. |
| C305.2.4 | Analyze data structures like Collections, Lists, etc. |
| C305.2.5 | Write defensive programming using Exception Handling. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C305.2.1 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | 3 | - | 2 | 2 | 1 |
| C305.2.2 | 2 | 3 | 2 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 2 | 1 |
| C305.2.3 | 3 | 2 | 3 | 2 | 1 | - | - | - | - | - | 2 | - | 1 | 2 | 1 |
| C305.2.4 | 2 | 2 | 1 | 2 | 3 | - | - | - | - | - | 2 | - | 2 | 1 | 1 |
| C305.2.5 | 2 | 1 | 2 | 3 | 1 | - | - | - | - | - | 1 | - | 2 | 1 | 1 |
| C305.2 | 2.2 | 2 | 2 | 2.2 | 1.6 | - | - | ! | ! | ! | 2 | ! | 1.8 | 1.6 | 1 |

| | |
|-------------|--------------|
| Course Name | Mechatronics |
| Course Code | 16ECT561 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C306.1.1 | Design and conduct experiments to evaluate the performance of a mechatronics system |
| C306.1.2 | Design mechatronics component, system or process to meet desired needs |
| C306.1.3 | Use the techniques, skills, and modern mechatronics engineering tools necessary for engineering practice. |
| C306.1.4 | Identify and evaluate ethical ramifications and professional responsibilities in a variety of situations |
| C306.1.5 | Discuss the impact of engineering on society, safety, and environment in relation to contemporary issues |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|----------|----------|-----|-----|-----|-----|------|------------|------|------|------|------|
| C306.1.1 | 1 | 1 | 2 | 1 | 3 | - | - | - | - | - | 3 | - | 2 | 2 | 1 |
| C306.1.2 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | 3 | - | 2 | 2 | 1 |
| C306.1.3 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | 2 | - | 1 | 1 | 1 |
| C306.1.4 | 2 | 1 | 1 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 |
| C306.1.5 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | - | 2 | 1 | 1 |
| C306.1 | 1.8 | 1.4 | 1.8 | 2 | 2 | - | - | - | - | - | 2.2 | - | 1.8 | 1.4 | 1 |

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|-------------|-----------------------------------|
| Course Name | Energy Engineering and Management |
| Course Code | 16ECT562 |
| Semester | V |

| CO. No. | Statements |
|----------|---|
| | On completion of this course, students will be able to: |
| C306.2.1 | Describe the technology behind Steam Power plants and the types of fuels used. |
| C306.2.2 | Understand and describe diesel engine power plants, and the auxiliaries used. |
| C306.2.3 | Differentiate between the various types of Energy forms. |
| C306.2.4 | Understand the management of electric energy |
| C306.2.5 | Describe the methods used in thermal energy management and energy conversation. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C306.2.1 | 3 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | | | |
| C306.2.2 | 2 | 1 | 3 | 2 | 1 | - | - | - | - | - | - | - | | | |
| C306.2.3 | 3 | 2 | 2 | 3 | 2 | - | - | - | - | - | 2 | - | | | |
| C306.2.4 | 2 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | | | |
| C306.2.5 | 2 | 2 | 3 | 3 | 3 | - | - | - | - | - | 1 | - | | | |
| C306.2 | 2.4 | 1.8 | 2.2 | 2.2 | 1.6 | - | - | - | - | - | 1.5 | | | | |

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|-------------|----------------|
| Course Name | Linear Algebra |
| Course Code | 16ECT563 |
| Semester | V |

| CO. No. | Statements |
|----------|---|
| | On completion of this course, students will be able to: |
| C306.3.1 | Understand vector spaces, basis, linear transformations and the process of obtaining matrix of linear transformations arising in magnification and rotation of images |

| | |
|-----------------|--|
| C306.3.2 | Apply the techniques of QR and singular value decomposition for data compression, least square approximation in solving inconsistent linear systems. |
| C306.3.3 | Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits. |
| C306.3.4 | Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in control systems and system communications. |
| C306.3.5 | Apply the idea of joint probability distributions and the role of parameter dependent random variables in random process. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C306.3.1 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | 2 | | | |
| C306.3.2 | 3 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | | | |
| C306.3.3 | 3 | 3 | 2 | 2 | 2 | - | - | - | - | 2 | 2 | 1 | | | |
| C306.3.4 | 2 | 3 | 2 | 1 | 2 | - | | - | - | 1 | 2 | 1 | | | |
| C306.3.5 | 2 | 3 | 3 | 2 | 1 | - | - | - | - | - | 2 | 1 | | | |
| C306.3 | 2.6 | 3 | 2.4 | 1.8 | 1.8 | - | - | - | - | 1.5 | 2 | 1.4 | | | |

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|--------------------|----------------------------|
| Course Name | Microcontroller Lab |
| Course Code | 16ECL57 |
| Semester | V |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C307.1 | Understand data moving and exchange programs. |
| C307.2 | Analyze and write delay programs. |
| C307.3 | Interface Stepper motor, DC motor to the microcontroller. |
| C307.4 | Discuss seven segment display and keyboard interface. |
| C307.5 | Analyze different types of code conversion programs. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C307.1 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | 3 | 2 | 2 | 2 | 1 |
| C307.2 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 3 | 2 | 3 | 1 | 1 |
| C307.3 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 3 | 3 | 2 | 1 | 1 |
| C307.4 | 2 | 2 | 3 | 3 | 3 | - | - | - | - | - | 3 | 2 | 3 | 2 | 2 |
| C307.5 | 3 | 1 | 3 | 3 | 1 | - | - | - | - | - | 3 | 2 | 3 | 2 | 1 |
| C307 | 2.4 | 2.2 | 3 | 2.6 | 2.4 | - | - | ! | ! | ! | 3 | 2.2 | 2 | 1.6 | 1.2 |

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|--------------------|---------------------------------|
| Course Name | Communication System Lab |
| Course Code | 16ECL58 |
| Semester | V |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C308.1 | Demonstrate second order active filters for various frequency bands |
| C308.2 | Understand the design and implementation concept for modulation and demodulation circuit using amplitude modulation. |
| C308.3 | Understand the design and implementation concept for modulation circuit using frequency modulation |
| C308.4 | Analyze the circuit by conducting the precision rectifiers experiment |
| C308.5 | Construct the circuit and demonstrate the characteristics of pre-emphasis and de-emphasis circuit. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|----------|----------|-----|-----|----------|----------|----------|----------|------------|------|------|------|
| C308.1 | 3 | 1 | 2 | 1 | 3 | - | - | - | 3 | - | 3 | 1 | 2 | 2 | 1 |
| C308.2 | 2 | 2 | 2 | 2 | - | - | - | - | 3 | - | 2 | 2 | 3 | 1 | 1 |
| C308.3 | 2 | 1 | 3 | 2 | - | - | - | - | 3 | - | 2 | 2 | 2 | 1 | 1 |
| C308.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | 3 | - | 2 | 2 | 3 | 2 | 2 |
| C308.5 | 2 | 2 | 1 | 3 | - | - | - | - | 3 | - | 1 | 1 | 3 | 2 | 1 |
| C308 | 2.4 | 1.6 | 1.8 | 2 | 2 | - | - | - | 3 | - | 2 | 1.6 | 2 | 2 | 1 |

| | |
|--------------------|-------------------------|
| Course Name | General Aptitude |
| Course Code | 16ECH59 |
| Semester | V |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C309.1 | Solve and analyze different types of Numerical / Arithmetical problems. |
| C309.2 | Solve and analyze different Data interpretation problems. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|----------|----------|------------|----------|----------|----------|----------|----------|------------|------------|----------|----------|----------|----------|----------|
| C309.1 | 1 | 3 | 3 | 2 | - | - | - | - | 2 | 2 | - | 2 | 3 | 3 | 3 |
| C309.2 | 1 | 3 | 2 | 2 | 2 | - | - | - | 1 | 3 | - | 2 | 3 | 3 | 3 |
| C309 | 1 | 3 | 2.5 | 2 | 2 | - | - | - | 1.5 | 2.5 | - | 2 | 3 | 3 | 3 |

| | |
|--------------------|----------------------------------|
| Course Name | Digital Signal Processing |
| Course Code | 16ECT61 |
| Semester | VI |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C310.1 | Implement DFT using linear filtering. |
| C310.2 | Implement DFT using Fast Fourier Transforms. |
| C310.3 | Design and analyze digital FIR filters and structure of FIR filters. |
| C310.4 | Design and analyze digital IIR filters and structure of IIR filters. |
| C310.5 | Explain the concept of Multi-rate signal processing and sample rate conversion. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C310.1 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C310.2 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 |
| C310.3 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 1 | 1 | 1 |
| C310.4 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C310.5 | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 1 | 1 |
| C310 | 2.4 | 2.2 | 2.4 | 1.8 | 2.2 | - | - | - | - | - | 1.8 | 1.8 | 1.8 | 1.4 | 1 |

| | |
|--------------------|------------------------------|
| Course Name | Digital Communication |
| Course Code | 16ECT62 |
| Semester | VI |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C311.1 | Sample a signal and reconstruct it at receiver. |
| C311.2 | Design a PCM, DPCM, DM and ADM systems. |
| C311.3 | Design Base Band shaping for data transmission. |
| C311.4 | Describe system level blocks for BPSK, ASK, DPSK and QPSK systems. |
| C311.5 | Analyze coherent and no-coherent digital modulation systems and understand the basics of spread spectrum technology. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-------------|----------|------------|----------|----------|----------|-----|-----|----------|----------|----------|------------|------------|------|------|------|
| C311.1 | 3 | 2 | 2 | 1 | 3 | - | - | - | - | - | 3 | 1 | 2 | 3 | 1 |
| C311.2 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 1 | 3 | 2 | 2 |
| C311.3 | 3 | 1 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 3 | 2 | 1 |
| C311.4 | 3 | 2 | 1 | 2 | | - | - | - | - | - | 1 | 2 | 2 | 1 | 1 |
| C311.5 | 3 | 2 | 2 | 3 | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 1 |
| C311 | 3 | 1.8 | 2 | 2 | 3 | - | - | ! | ! | ! | 1.8 | 1.4 | 2.4 | 2 | 1.2 |

| | |
|--------------------|-------------------------------------|
| Course Name | Antenna and Propagation (IC) |
| Course Code | 16ECI631 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C312.1.1 | Describe the basic parameters of antenna. |
| C312.1.2 | Discuss the concepts of aperture and slot antenna. |
| C312.1.3 | Analyze antenna arrays. |
| C312.1.4 | Understand the concept and principle of special antennas. |
| C312.1.5 | Understand the propagation of radio waves. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C312.1.1 | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | 1 | 2 | 3 | 1 |
| C312.1.2 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C312.1.3 | 2 | 3 | 1 | 2 | - | - | - | - | - | - | 2 | 1 | 3 | 2 | 1 |
| C312.1.4 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C312.1.5 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| C312.1 | 2.2 | 2.6 | 1.6 | 2.4 | - | - | - | - | - | - | 1.5 | 1.4 | 2.2 | 2.2 | 1.2 |

| | |
|--------------------|-------------------------------|
| Course Name | Database Concepts (IC) |
| Course Code | 16ECI632 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C312.2.1 | Explain the basic concepts of database and Database Management System. |
| C312.2.2 | Differentiate between relational systems and non-relational systems. |
| C312.2.3 | Describe how to maintain data (CRUD operations) in relational and non-relational database. |
| C312.2.4 | Manage Java programs to access database management systems using JDBC. |
| C312.2.5 | Save and retrieve data in a safe and consistent manner. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C312.2.1 | 2 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C312.2.2 | 2 | 3 | 1 | 2 | 3 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| C312.2.3 | 3 | 2 | 2 | 2 | 3 | - | - | - | - | - | 2 | - | 1 | 1 | 1 |
| C312.2.4 | 2 | 2 | 1 | 3 | 3 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C312.2.5 | 3 | 1 | 2 | 3 | 1 | - | - | - | - | - | 1 | - | 3 | 2 | - |
| C312.2 | 2.4 | 2 | 1.6 | 2.6 | 2.4 | - | - | - | - | - | 1.5 | - | 2 | 1.8 | 1.4 |

| | |
|--------------------|----------------------------|
| Course Name | Operations Research |
| Course Code | 16ECT641 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C313.1.1 | Describe some basics of Linear programming and solve problems on the same |
| C313.1.2 | Analyze Linear programming problems |
| C313.1.3 | Describe and Analyze Transportation problems |
| C313.1.4 | Describe the various methods involved in CPM technique |
| C313.1.5 | Understand the basics of Integer programming |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C313.1.1 | | | | | | | | - | - | - | - | - | | | |
| C313.1.2 | | | | | | | | - | - | - | - | - | | | |
| C313.1.3 | | | | | | | | - | - | - | 2 | - | | | |
| C313.1.4 | | | | | | | | - | - | - | - | - | | | |
| C313.1.5 | | | | | | | | - | - | - | 1 | - | | | |
| C313.1 | | | | | | | | | | | | | | | |

| | |
|--------------------|-----------------|
| Course Name | Robotics |
| Course Code | 16ECT642 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C313.2.1 | Understand the basics of automation and also brief history of robot and applications. |
| C313.2.2 | Familiarize with the kinematic motions of robot. |
| C313.2.3 | Have good knowledge about robot end effectors and their design concepts. |
| C313.2.4 | Analyze with the Programming methods & various Languages of robots. |
| C313.2.5 | Familiarize with the principles of various Sensors and their applications in robots. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|----------|------------|----------|----------|----------|-----|-----|----------|----------|----------|------------|----------|------|------|------|
| C313.2.1 | 1 | 3 | 2 | 1 | - | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| C313.2.2 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 2 | 3 | 2 |
| C313.2.3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 3 | 1 | 1 |
| C313.2.4 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 |
| C313.2.5 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 2 | 2 | 1 | 1 | 1 |
| C313.2 | 2 | 2.2 | 2 | 2 | - | - | - | - | - | - | 2.2 | 2 | 2 | 2 | 2 |

| | |
|--------------------|--------------------------------------|
| Course Name | Internet of Things (IoT) (IC) |
| Course Code | 16ECI643 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C313.3.1 | Understand the vision of IoT from a global context. |
| C313.3.2 | Determine the Market perspective of IoT. |
| C313.3.3 | Use of Devices, Gateways and Data Management in IoT. |
| C313.3.4 | Understand the building state of the art architecture in IoT. |
| C313.3.5 | Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints. |

| POS CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C313.3.1 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 3 |
| C313.3.2 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 3 |
| C313.3.3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | 1 | - | 2 | 1 | 3 |
| C313.3.4 | 2 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| C313.3.5 | 1 | 2 | 3 | 3 | - | - | - | - | - | - | 1 | - | 2 | 2 | 2 |
| C313.3 | 2 | 2.4 | 2.6 | 2 | - | - | - | - | - | - | 1 | - | 1.8 | 1.6 | 2.4 |

| | |
|--------------------|--------------------------------------|
| Course Name | Digital Signal Processing Lab |
| Course Code | 16ECL65 |
| Semester | VI |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C314.1 | Implement circular and section convolution. |
| C314.2 | Implement linear convolution and circular convolution using DFT and IDFT. |
| C314.3 | Implement digital FIR filter to meet the given specifications. |
| C314.4 | Implement digital IIR filters to meet the given specification. |
| C314.5 | Implement convolution and filtering using DSP processor. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C314.1 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1 | 2 | 2 | 2 |
| C314.2 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1 | 1 | 2 | 2 |
| C314.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C314.4 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 |
| C314.5 | 3 | 2 | 2 | 2 | 3 | - | - | - | - | - | 3 | 2 | 1 | 1 | 1 |
| C314 | 2.2 | 2.8 | 2 | 2 | 2.2 | - | - | - | - | - | 2.2 | 1.6 | 1.6 | 1.4 | 1.2 |

| | |
|--------------------|--------------------------|
| Course Name | LabVIEW - Level I |
| Course Code | 16HOE661 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C315.1.1 | Formulate basic aspects of the graphical programming using LabVIEW 2016. |
| C315.1.2 | Develop LabVIEW coding for a specific problem of datalogging, measurement and presentation. |
| C315.1.3 | Handle the error function and errors in the LabVIEW coding. |
| C315.1.4 | Develop coding for data handling and Analysis on the acquired data. |
| C315.1.5 | Design a state machine LabVIEW coding for an applied problem. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.1.1 | 3 | 2 | 2 | 3 | 3 | - | - | - | - | - | 1 | - | 2 | 2 | 2 |
| C315.1.2 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | - | 1 | 2 | 1 |
| C315.1.3 | 2 | 2 | 2 | 2 | 3 | - | - | - | - | - | 2 | - | 1 | 1 | 1 |
| C315.1.4 | 2 | 3 | 2 | 3 | 3 | - | - | - | - | - | 1 | - | 2 | 1 | 1 |
| C315.1.5 | 3 | 2 | 3 | 3 | 3 | - | - | - | - | - | 1 | - | 1 | 1 | 1 |
| C315.1 | 2.4 | 2.2 | 2.4 | 2.6 | 3 | - | - | - | - | - | 1.4 | - | 2 | 1.4 | 1.2 |

| | |
|--------------------|----------------------------|
| Course Name | Yoga and Meditation |
| Course Code | 16HOE662 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.2.1 | Know the basic principles of Yoga. |
| C315.2.2 | Know and practice the basic asanas and their benefits. |
| C315.2.3 | Use Pranayama and Meditation for improving health and mental peace. |
| C315.2.4 | Know the difference between meditation and concentration. |
| C315.2.5 | Apply the principles of Ayurveda and implement them for one's benefit. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C315.2.1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 | - | 3 | - | - | 3 |
| C315.2.2 | - | - | - | - | 3 | 3 | 1 | 2 | 2 | 2 | - | 3 | - | 1 | 3 |
| C315.2.3 | - | - | - | - | - | 1 | 2 | 2 | 1 | 3- | - | 2 | - | 1 | 3 |
| C315.2.4 | - | - | - | - | - | 2 | 2 | 2 | 3 | 1 | - | 2 | - | - | 3 |
| C315.2.5 | - | - | - | - | - | 2 | 2 | 1 | 2 | - | - | 21 | - | - | 3 |
| C315.2 | - | - | - | - | 3 | 2.2 | 1.8 | 1.8 | 2 | 1.67 | - | 6.2 | - | 1 | 3 |

| | |
|--------------------|---------------------|
| Course Name | Martial Arts |
| Course Code | 16HOE663 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.3.1 | |
| C315.3.2 | |
| C315.3.3 | |
| C315.3.4 | |
| C315.3.5 | |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.3.1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 | - | 3 | - | | 3 |
| C315.3.2 | - | - | - | - | - | 3 | 1 | 2 | 2 | 2 | - | 3 | - | 1 | 3 |
| C315.3.3 | - | - | - | - | - | 1 | 2 | 2 | 1 | 3- | - | 2 | - | 1 | 3 |
| C315.3.4 | - | - | - | - | - | 2 | 2 | 2 | 3 | 1 | - | 2 | - | - | 3 |
| C315.3.5 | - | - | - | - | - | 2 | 2 | 1 | 2 | - | - | 21 | - | - | 3 |
| C315.3 | - | - | - | - | - | 2.2 | 1.8 | 1.8 | 2 | 1.67 | - | 6.2 | - | 1 | 3 |

| | |
|-------------|-------------------------------------|
| Course Name | Music (Carnatic Vocal/Instrumental) |
| Course Code | 16HOE664 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C315.4.1 | Gain knowledge about the theoretical background of carnatic music |
| C315.4.2 | Acquire practical knowledge on basics of Carnatic music. |
| C315.4.3 | Practical demonstration of different Talas. |
| C315.4.4 | Distinguish among various Raagas based on swarasthanas. |
| C315.4.5 | To synchronize the Raaga and Taala. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.4.1 | - | - | - | - | 2 | 3 | - | 3 | 2 | 2 | - | 3 | - | - | 3 |
| C315.4.2 | - | - | - | - | 3 | 1 | - | 2 | 2 | - | - | 2 | - | - | 3 |
| C315.4.3 | - | - | - | - | 1 | 1 | 1 | 2 | 1 | - | - | 2 | - | - | 3 |
| C315.4.4 | - | - | - | - | 1 | 1 | - | 2 | 3 | 1 | - | 3 | - | - | 3 |
| C315.4.5 | - | - | - | - | 1 | - | - | 2 | 3 | 1 | - | 3 | - | - | 3 |
| C315.4 | - | - | - | - | 1.6 | 1.5 | 1 | 2.2 | 2.2 | 1.33 | - | 2.6 | - | - | 3 |

| | |
|--------------------|-----------------------------|
| Course Name | Dance (Bharatanatya) |
| Course Code | 16HOE665 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.5.1 | Get an insight into various types of Indian dances. |
| C315.5.2 | Gain knowledge of different instruments used to perform dance. |
| C315.5.3 | Perform exercises on prarthane, Namaskara according to Bharatanatya style. |
| C315.5.4 | Perform basic steps in Abhinaya. |
| C315.5.5 | Recognise and perform different Adavus. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C315.5.1 | - | - | - | - | 2 | 3 | - | 3 | 2 | 2 | - | 3 | - | - | 3 |
| C315.5.2 | - | - | - | - | 3 | 1 | - | 2 | 2 | - | - | 2 | - | - | 3 |
| C315.5.3 | - | - | - | - | 1 | 1 | 1 | 2 | 1 | - | - | 2 | - | - | 3 |
| C315.5.4 | - | - | - | - | 1 | 1 | - | 2 | 3 | 1 | - | 3 | - | - | 3 |
| C315.5.5 | - | - | - | - | 1 | - | - | 2 | 3 | 1 | - | 3- | - | - | 3 |
| C315.5 | - | - | - | - | 1.6 | 1.5 | 1 | 2.2 | 2.2 | 1.33 | - | 2.5 | - | - | 3 |

| | |
|--------------------|---------------|
| Course Name | Sports |
| Course Code | 16HOE666 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.6.1 | |
| C315.6.2 | |
| C315.6.3 | |
| C315.6.4 | |
| C315.6.5 | |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C315.6.1 | - | - | - | - | 2 | 3 | - | 1 | 2 | 2 | - | 3 | - | - | 3 |
| C315.6.2 | - | - | - | - | 3 | 1 | - | 2 | 2 | - | - | 2 | - | 1 | 3 |
| C315.6.3 | - | - | - | - | 1 | 1 | 1 | 2 | 1 | - | - | 2 | - | 1 | 3 |
| C315.6.4 | - | - | - | - | 1 | 1 | - | 2 | 3 | 1 | - | 3 | - | - | 3 |
| C315.6.5 | - | - | - | - | 2 | 2 | - | 1 | 3 | 1 | - | 3- | - | - | 3 |
| C315.6 | - | - | - | - | 1.8 | 1.6 | 1 | 1.6 | 2.2 | 1.33 | - | 2.5 | - | 1 | 3 |

| | |
|-------------|---------------------------|
| Course Name | Digital Communication Lab |
| Course Code | 16ECL67 |
| Semester | VI |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C316.1 | Implement ASK, PSK and FSK. |
| C316.2 | Implement TDM using optical fiber. |
| C316.3 | Demonstrate the QPSK generation. |
| C316.4 | Realize the design theory concept using software. |
| C316.5 | Analyze and understand the outputs by changing the important parameters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|----------|----------|-----|-----|----------|----------|----------|------------|------------|------|------|------|
| C316.1 | 2 | 1 | 2 | 1 | 3 | - | - | - | - | - | 2 | 1 | 2 | 3 | 2 |
| C316.2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C316.3 | 2 | 1 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C316.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 |
| C316.5 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 2 | 3 | 2 |
| C316 | 2.2 | 1.6 | 1.8 | 2 | 2 | - | - | - | - | - | 1.8 | 1.8 | 2.6 | 3 | 1.4 |

| | |
|--------------------|---------------------------------|
| Course Name | Mini project and Seminar |
| Course Code | 16ECP69 |
| Semester | VI |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C318.1 | Apply knowledge of electronics and communication, to select topic relevant to the Current trends in multidisciplinary engineering domains. |
| C318.2 | Show competence in defining and explaining topics under discussion. |
| C318.3 | Analyze different methodologies, tools and scope for the concept. |
| C318.4 | Use technical resources to study the emerging engineering trends. |
| C318.5 | Write technical report effectively and relate the study and effectively communicate by making an oral presentation. |

| COS POS | PO 1 | PO2 | PO3 | PO4 | PO 5 | PO 6 | PO7 | PO8 | PO9 | P010 | P01 1 | PO12 | PS01 | PS02 | PSO 3 |
|--------------------|---------|------|-----|-----|---------|---------|-----|-----|-----|------|----------|------|------|------|----------|
| C318. 1 | 3 | - | - | - | 1 | 1 | - | - | - | - | - | - | 1 | - | 2 |
| C318. 2 | 3 | 1 | - | - | 2 | 1 | 1 | - | - | - | - | - | 2 | 1 | 1 |
| C318. 3 | 3 | 2 | - | - | 2 | - | - | - | - | - | - | 2 | 1 | - | 3 |
| C318. 4 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | - | - | 1 | 2 | 2 |
| C318. 5 | 2 | - | - | - | - | - | - | - | 1 | 2 | - | - | 1 | - | 2 |
| C318 | 1.8 | 1.35 | | | 1 | 2 | 1 | | 1.5 | 2 | | 2 | 1.2 | 1.5 | 2 |

| | |
|--------------------|--------------------------|
| Course Name | Power Electronics |
| Course Code | 16ECT71 |
| Semester | VII |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C401.1 | Design drive controls for power semiconductor devices. |
| C401.2 | Analyze the operation of single phase and three phase rectifiers with various loads. |
| C401.3 | Design commutation circuits. |
| C401.4 | Design AC-voltage controllers for different configurations. |
| C401.5 | Analyze the operation of choppers and inverters. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C401.1 | 2 | 2 | 2 | 1 | 1 | - | 1 | - | 1 | - | 2 | - | 2 | 3 | 1 |
| C401.2 | 2 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | 2 | - | 3 | 3 | 1 |
| C401.3 | 2 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | 2 | - | 2 | 3 | 2 |
| C401.4 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 2 | - | 2 | 2 | 1 |
| C401.5 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | - | - | - | 2 | - | 2 | 2 | 1 |
| C401 | 2.2 | 2.2 | 2 | 1.8 | 1.4 | 1 | 1 | - | 1 | - | 2 | - | 2.2 | 2.6 | 1.2 |

| | |
|--------------------|---------------------------|
| Course Name | Data Communication |
| Course Code | 16ECT72 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C402.1 | Describe layers of OSI model and its functions. |
| C402.2 | Discuss the different protocols of Noiseless and Noisy channels. |
| C402.3 | Analyze different types of Ethernet. |
| C402.4 | Distinguish below Virtual and Connecting LANs. |
| C402.5 | Describe the functions of network layer, Transition from Ipv4 to Ipv6. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C402.1 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C402.2 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 1 |
| C402.3 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 1 | 3 | 2 |
| C402.4 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| C402.5 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 | 1 |
| C402 | 2.2 | 2.8 | 2 | 1.8 | - | - | - | - | - | - | - | 2 | 1.8 | 2 | 1.2 |

| | |
|--------------------|---|
| Course Name | Optical Fiber Communication (IC) |
| Course Code | 16ECI731 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C403.1.1 | Know the fundamental concepts of OFC. |
| C403.1.2 | Analyze the characteristics of Optical Fiber and functions of various Sources and Detectors. |
| C403.1.3 | Describe various Fiber couplers, connectors and analyse Optical receivers. |
| C403.1.4 | Distinguish Analog and Digital Links. |
| C403.1.5 | Discuss concept of WDM, Optical Amplifiers and Optical networks. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C403.1.1 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | - | - | 1 | 2 | 2 | 2 | 2 | 1 |
| C403.1.2 | 3 | 2 | 1 | 1 | - | 1 | - | - | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| C403.1.3 | 3 | 1 | 1 | - | - | 1 | - | - | - | 1 | 1 | 2 | 1 | 3 | 2 |
| C403.1.4 | 3 | 2 | 1 | - | - | 1 | - | - | - | 2 | 1 | 2 | 2 | 2 | 1 |
| C403.1.5 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | 2 | 1 | 2 | 2 | 1 | 1 |
| C403.1 | 3 | 2 | 1.4 | 1 | 1 | 1 | 1 | - | 1 | 1.4 | 1.4 | 2 | 1.8 | 2 | 1.2 |

| | |
|--------------------|----------------------------|
| Course Name | Web Technology (IC) |
| Course Code | 16ECI732 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C403.2.1 | Analyze the concepts of Web Technologies. |
| C403.2.2 | Compare Web Servers and App Servers. |
| C403.2.3 | Implement Request and Response models. |
| C403.2.4 | Demonstrate how to build e-commerce applications using Servlets and JSP. |
| C403.2.5 | Design dynamic web pages using EL Tags |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C403.2.1 | 2 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| C403.2.2 | 2 | 3 | 1 | 2 | 3 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C403.2.3 | 3 | 2 | 2 | 2 | 3 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| C403.2.4 | 2 | 2 | 1 | 3 | 3 | - | - | - | - | - | - | - | 1 | 3 | 1 |
| C403.2.5 | 3 | 1 | 2 | 3 | 1 | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C403.2 | 2.4 | 2 | 1.6 | 2.6 | 2.4 | - | - | - | - | - | 1.5 | - | 1.6 | 2.2 | 1.6 |

| | |
|--------------------|-------------------------------|
| Course Name | Wireless Communication |
| Course Code | 16ECT741 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C404.1.1 | Describe basics of wireless communication techniques. |
| C404.1.2 | Analyze and describe the fundamentals of cellular concepts. |
| C404.1.3 | Describe mobile radio communication in depth. |
| C404.1.4 | Distinguish between different types of modulation techniques for mobile radio communication. |
| C404.1.5 | Differentiate the types of Multiple Access schemes. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|------|-----|-----|-----|------|-----|------|------|------|------|------|------|
| C404.1.1 | 3 | 2 | 2 | - | - | 2 | 1 | 1 | - | 2 | 2 | 1 | 2 | 2 | 1 |
| C404.1.2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | - | - | 2 | 1 | 2 | 2 | 2 | 1 |
| C404.1.3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | - | 2 | 2 | 2 | 1 | 3 | 2 |
| C404.1.4 | 3 | 2 | 1 | - | 3 | 1 | 1 | - | - | 3 | 2 | 2 | 2 | 2 | 1 |
| C404.1.5 | 3 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 |
| C404.1 | 3 | 2 | 2.4 | 1.33 | 1.5 | 1.2 | 1 | 1.33 | 1 | 2.2 | 1.6 | 1.8 | 1.8 | 2 | 1.2 |

| | |
|--------------------|--------------------------------|
| Course Name | Artificial Intelligence |
| Course Code | 16ECT742 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C404.2.1 | Design intelligent agents for solving simple gaming by using artificial intelligence. |
| C404.2.2 | Apply non-trivial AI techniques to handle complex problems. |
| C404.2.3 | Apply various symbolic knowledge representation to specific problems. |
| C404.2.4 | Design Knowledge-based agents. |
| C404.2.5 | Understand syntax and semantics of first-order logic. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C404.2.1 | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C404.2.2 | 3 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C404.2.3 | 3 | 2 | 2 | 2 | 3 | - | - | - | - | - | - | - | 2 | 3 | 2 |
| C404.2.4 | 2 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C404.2.5 | 2 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 |
| C404.2 | 2.4 | 2 | 2 | 2 | 1.8 | - | - | - | - | - | - | - | 2.2 | 2.2 | 1.2 |

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|--------------------|--|
| Course Name | Micro-Electro-Mechanical Systems (MEMS) |
| Course Code | 16ECT743 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C404.3.1 | Describe new applications and directions of modern engineering. |
| C404.3.2 | Describe the techniques for building microdevices in silicon, polymer, metal and other materials. |
| C404.3.3 | Describe the physical, chemical, biological, and engineering principles involved in the design and operation of current and future microdevices. |
| C404.3.4 | Analyze Microsystems technology for technical feasibility as well as practicality. |
| C404.3.5 | Describe the limitations and current challenges in microsystems technology. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C404.3.1 | 3 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C404.3.2 | 2 | 2 | - | 1 | 1 | - | - | - | - | - | - | - | 2 | 1 | 1 |
| C404.3.3 | 2 | 1 | 3 | 2 | - | 1 | - | - | - | - | 2 | - | 2 | 2 | 1 |
| C404.3.4 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 |
| C404.3.5 | 2 | 1 | 1 | 3 | 3 | - | - | - | - | - | 1 | - | 2 | 1 | 1 |
| C404.3 | 2.4 | 1.4 | 2 | 2 | 2 | 1 | - | - | - | - | 1.5 | - | 2.2 | 1.6 | 1.2 |

| | |
|--------------------|-----------------------|
| Course Name | Tax Management |
| Course Code | 16HOE751 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C405.1.1 | Gain knowledge about the system of taxation prevailing in the country. |
| C405.1.2 | Compute tax under different heads. |
| C405.1.3 | Gain practical knowledge on filing returns. |
| C405.1.4 | Calculate the payable tax for salaried individuals. |
| C405.1.5 | Gain insight into recent practices on taxation. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|------|------|-----|-----|-----|------|------|------|------|------|------|
| COs | | | | | | | | | | | | | | | |
| C405.1.1 | - | 3 | 2 | 3 | - | - | - | - | - | - | 1 | 1 | 1 | - | 1 |
| C405.1.2 | - | 1 | 2 | 3 | - | - | - | - | - | - | 2 | 2 | - | - | - |
| C405.1.3 | 1 | 3 | 2 | 2 | 1 | 2 | - | - | - | - | 2 | 2 | - | - | 2 |
| C405.1.4 | - | 2 | 2 | 1 | 2 | 2 | - | - | - | - | 1 | 3 | 1 | 1 | - |
| C405.1.5 | - | 2 | 1 | 2 | 2 | 1 | - | - | - | - | 1 | 3 | 1 | 1 | 1 |
| C405.1 | 1 | 2.2 | 1.8 | 2.2 | 1.67 | 1.67 | - | - | - | -- | 1.4 | 2.2 | 1 | 1 | 1.25 |

| | |
|--------------------|--|
| Course Name | Assessment of Building Energy Performance |
| Course Code | 16HOE752 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C405.2.1 | Produce an ASHRAE Building EQ In Operation rating for the buildings provided in the class |

| | |
|-----------------|--|
| C405.2.2 | Produce a listing of potential Energy Efficiency Measures (EEM) including financial payback analysis |
| C405.2.3 | Perform measurements of indoor environmental quality and HVAC system performance |
| C405.2.4 | Identify different building types and determine the impact of climate on energy use. |
| C405.2.5 | Analyze raw energy consumption data from measured-meter readings |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| C405.2.1 | 1 | - | - | - | 1 | - | 1 | 1 | - | - | 1 | - | 1 | - | 1 |
| C405.2.2 | 1 | - | - | - | - | 1 | 2 | - | - | - | 2 | - | - | - | - |
| C405.2.3 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - | - | - | 2 |
| C405.2.4 | 1 | - | - | - | 1 | 1 | 1 | - | - | - | 1 | - | 1 | 1 | - |
| C405.2.5 | 1 | - | - | - | 1 | 1 | 1 | - | - | - | 1 | - | 1 | 1 | 1 |
| C405.2 | 1 | - | - | - | 1 | 1 | 1.2 | 1 | - | - | 1.4 | - | 1 | 1 | 1.25 |

| | |
|--------------------|---|
| Course Name | Natural Disaster Mitigation and Management |
| Course Code | 16HOE753 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C405.3.1 | Learn about the types of natural and environmental disasters and its causes. |
| C405.3.2 | Learn about organizational and Administrative strategies for managing disasters. |
| C405.3.3 | Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation. |
| C405.3.4 | Learn methodologies for disaster risk assessment with the help of latest tools like GPS, GIS, Remote sensing, information technologies, etc. |
| C405.3.5 | Understand the key roles of capacity building to face disaster among government bodies, institutions, NGO's, etc. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C405.3.1 | - | - | - | - | - | 3 | 2 | - | - | - | - | - | 1 | - | 1 |
| C405.3.2 | - | - | - | - | - | 3 | 2 | - | - | - | - | - | - | - | - |
| C405.3.3 | - | - | - | - | - | 3 | 1 | - | - | - | 2 | - | - | - | 2 |
| C405.3.4 | - | - | - | - | - | 3 | 1 | - | - | - | - | - | 1 | 1 | - |
| C405.3.5 | - | - | - | - | - | 2 | 2 | - | - | - | 1 | - | 1 | 1 | 1 |
| C405.3 | - | - | - | - | - | 2.8 | 1.6 | - | - | -- | - | - | 1 | 1 | 1.25 |

| | |
|--------------------|---|
| Course Name | Small and Medium Enterprise Management |
| Course Code | 16HOE761 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C406.1.1 | Visualize the various concepts of Entrepreneurship and understand of current environment of MSMEs. |

| | |
|-----------------|---|
| C406.1.2 | Know the Business Environment with respect to MSMEs. |
| C406.1.3 | Know the Process of Enterprise Creation. |
| C406.1.4 | Prepare Business Plan and Understand the Institutional Support Mechanism. |
| C406.1.5 | Know the marketing management with reference to MSMEs. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C406.1.1 | - | - | - | - | - | 3 | 2 | - | - | - | - | - | 1 | - | 1 |
| C406.1.2 | - | - | - | - | - | 3 | 2 | - | - | - | - | - | - | - | - |
| C406.1.3 | - | - | - | - | - | 3 | 1 | - | - | - | 2 | - | - | - | 2 |
| C406.1.4 | - | - | - | - | - | 3 | 1 | - | - | - | - | - | 1 | 1 | - |
| C406.1.5 | - | - | - | - | - | 2 | 2 | - | - | - | 1 | - | 1 | 1 | 1 |
| C406.1 | - | - | - | - | - | 2.8 | 1.6 | - | - | - | 1.5 | - | 1 | 1 | 1.25 |

| | |
|--------------------|--|
| Course Name | Occupational Safety and Health Administration |
| Course Code | 16HOE762 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C406.2.1 | Develop the ability to know the occupational health and safety. |
| C406.2.2 | Have the knowledge of the socio-economic aspects of occupational health and safety. |
| C406.2.3 | Demonstrate purpose of health screening measures. |
| C406.2.4 | Know the legal Provisions on Occupational Health and Safety. |
| C406.2.5 | Participate in Research and Occupational Health. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C406.2.1 | - | | | | | | | - | - | - | - | - | 1 | - | 1 |
| C406.2.2 | | | | | | | | - | - | - | - | - | - | - | - |
| C406.2.3 | | | | | | | | - | - | - | 2 | - | - | - | 2 |
| C406.2.4 | | | | | | | | - | - | - | - | - | 1 | 1 | - |
| C406.2.5 | | | | | | | | - | - | - | 1 | - | 1 | 1 | 1 |
| C406.2 | | | | | | | | | | | | | 1 | 1 | 1.25 |

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|--------------------|---|
| Course Name | Animation and Multimedia Engineering |
| Course Code | 16HOE763 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C406.3.1 | Recognize the basics of animation along the tools. |
| C406.3.2 | Develop characters with computer animation. |
| C406.3.3 | Develop 3D drawings of characters and acquire skills regarding basic level of sketching. |
| C406.3.4 | Explain Foreshortening, Facial expressions. |
| C406.3.5 | Develop small animation characters by using acting and sketching techniques. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C406.3.1 | 3 | 1 | 1 | - | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| C406.3.2 | 2 | 1 | 2 | - | 2 | - | - | - | - | - | - | - | 1 | 2 | - |
| C406.3.3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | - | 2 | 1 | 2 |
| C406.3.4 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 | - |
| C406.3.5 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 2 | 2 | 1 |
| C406.3 | 2 | 1.2 | 1.2 | - | 2 | - | - | - | - | - | 1.5 | - | 1.8 | 1.6 | 1.25 |

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|--------------------|------------------------------|
| Course Name | Power Electronics Lab |
| Course Code | 16ECL77 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C407.1 | Understand the fundamental concepts of MOSFET, IGBT and SCR. |
| C407.2 | Understand the basics of UJT HWR and FWR. |
| C407.3 | Discuss UJT triggering of SCR. |
| C407.4 | Understand Stepper motor concepts. |
| C407.5 | Describe various types of inverters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C407.1 | 3 | 1 | 1 | 1 | 2 | 1 | - | - | - | - | 2 | - | 2 | 2 | 1 |
| C407.2 | 3 | 2 | 1 | 1 | 2 | 1 | - | - | - | - | 1 | - | 3 | 2 | 1 |
| C407.3 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 |
| C407.4 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | 2 | - | 2 | 2 | 2 |
| C407.5 | 3 | 2 | 2 | 2 | 1 | - | 2 | - | - | - | 2 | - | 2 | 1 | 1 |
| C407 | 3 | 1.6 | 1.4 | 1.2 | 1.4 | 1 | 1.5 | - | - | - | 1.8 | - | 2.2 | 1.6 | 1.2 |

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|--------------------|-------------------------------|
| Course Name | Data Communication Lab |
| Course Code | 16ECL78 |
| Semester | VII |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C408.1 | Understand different data stuffing techniques used in communication. |
| C408.2 | Analyze basic encryption techniques. |
| C408.3 | Discuss spanning tree. |
| C408.4 | Understand serial communication techniques. |
| C408.5 | Describe telnet basics and remote access. |

| POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| COs | | | | | | | | | | | | | | | |
| C408.1 | 3 | 2 | 1 | 1 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| C408.2 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 1 | 3 | 2 | 1 |
| C408.3 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| C408.4 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| C408.5 | 2 | 3 | 3 | 2 | 3 | - | - | - | 2 | 2 | 2 | 3 | 2 | 1 | 1 |
| C408 | 2.2 | 2.8 | 2 | 1.8 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2.2 | 1.6 | 1.2 |

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|--------------------|------------------------------------|
| Course Name | Project Phase-I and Seminar |
| Course Code | 16ECP79 |
| Semester | VII |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C409.1 | Understand different data stuffing techniques used in communication. |
| C409.2 | Analyze basic encryption techniques. |
| C409.3 | Discuss spanning tree. |
| C409.4 | Understand serial communication techniques. |
| C409.5 | Describe telnet basics and remote access. |

| POS COs | PO 1 | PO2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | P010 | P01 1 | PO1 2 | PS01 | PS02 | PSO 3 |
|----------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-------------|-------------|--------------|
| C409.1 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | - | 1 | 1 | 2 | 2 |
| C409.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C409.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C409.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C409.5 | 3 | 1 | - | - | - | - | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C409 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 |

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|--------------------|-------------------------------------|
| Course Name | Project Phase-II and Seminar |
| Course Code | 16ECP81 |
| Semester | VIII |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C410.1 | Demonstrate proficient knowledge on the concepts involved. |
| C410.2 | Identify the problem and propose the possible solution through literature survey. |
| C410.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C410.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C410.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning. |

| POS COs | PO1 | PO2 | PO3 | PO4 | P O 5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PS01 | PS02 | PSO 3 |
|--------------------|-----|-----|-----|-----|-------------|-----|-----|-----|-----|------|------|------|------|------|----------|
| C41 0.1 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | - | 1 | 1 | 2 | 2 |
| C41 0.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C41 0.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C41 0.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C41 0.5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C41 0 | 3 | 2.2 | 2.3 | 1.3 | 2. 5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 |

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|--------------------|--------------------------------------|
| Course Name | Project Phase-III and Seminar |
| Course Code | 16ECP82 |
| Semester | VIII |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C411.1 | Demonstrate proficient knowledge on the concepts involved. |
| C411.2 | Identify the problem and propose the possible solution through literature survey. |
| C411.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C411.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C411.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning. |

| C0 | PO 1 | PO2 | PO3 | PO4 | PO 5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO1 1 | PO12 | PS01 | PS02 | PSO 3 |
|---------------|------|-----|-----|-----|------|-----|-----|-----|-----|------|-------|------|------|------|-------|
| C411.1 | 3 | 2 | - | - | | | | | 2 | 3 | | 1 | 1 | 2 | 2 |
| C411.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C411.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C411.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C411.5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C411 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | | 1 | 1.8 | 1.8 | 1.6 |

| | |
|--------------------|---------------------------------|
| Course Name | Evaluation and Viva-voce |
| Course Code | 16ECP83 |
| Semester | VIII |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C412.1 | Demonstrate proficient knowledge on the concepts involved. |
| C412.2 | Identify the problem and propose the possible solution through literature survey. |
| C412.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C412.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C412.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning. |

| C0 | PO1 | PO2 | PO3 | PO4 | P O 5 | PO6 | PO7 | PO8 | PO9 | P010 | P01 1 | PO12 | PS01 | PS02 | PSO 3 |
|--------------------|-----|-----|-----|-----|-------------|-----|-----|-----|-----|------|----------|------|------|------|----------|
| C41 2.1 | 3 | 2 | - | - | | | | | 2 | 3 | | 1 | 1 | 2 | 2 |
| C41 2.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 |
| C41 2.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 |
| C41 2.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 |
| C41 2.5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 |
| C41 2 | 3 | 2.2 | 2.3 | 1.3 | 2. 5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 |

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| | |
|--------------------|---|
| Course Name | Engineering Mathematics-III (IC) |
| Course Code | 17ECM31 |
| Semester | III |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C201.1 | Form partial differential equations and their solutions. |
| C201.2 | Expressing the given functions as infinite series of sine and cosine. |
| C201.3 | Apply Fourier and Z-Transform to different problems |
| C201.4 | Find approximated solutions by numerical methods |
| C201.5 | Use the SCILAB to solve the various types engineering problems |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C201.1 | 2 | 2 | 1 | 1 | 1 | 2 | - | - | - | - | - | - | 3 | 3 | 1 | 1.777778 |
| C201.2 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 2 | 2 | 1 | 1.333333 |
| C201.3 | 2 | 1 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | 3 | 2 | 2 | 1.777778 |
| C201.4 | 2 | 1 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | 2 | 1 | 1 | 1.333333 |
| C201.5 | 2 | 1 | 1 | 2 | 1 | 2 | - | - | - | - | - | - | 2 | 2 | 1 | 1.555556 |
| C201 | 2 | 1.2 | 1.4 | 1.2 | 1 | 1.6 | - | - | - | - | - | - | 2.4 | 2 | 1.2 | |

| | |
|--------------------|-----------------------------------|
| Course Name | Analog Electronic Circuits |
| Course Code | 17ECT32 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C202.1 | Design rectifiers, clipping and clamping circuits. |
| C202.2 | Analyze different ways of biasing transistors. |
| C202.3 | Evaluate transistor frequency response. |
| C202.4 | Design of simple amplifier and power amplifies circuits. |
| C202.5 | Analyze different type's oscillator circuits for particular frequencies. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C202.1 | 3 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | 1 | 2 | 2 | 1 | 1.888889 |
| C202.2 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 1 | 2.111111 |
| C202.3 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | 3 | 2 | 2.666667 |
| C202.4 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 2 | 2.222222 |
| C202.5 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 1 | 2 | 2 | 2.333333 |
| C202 | 3 | 3 | 3 | 2.2 | 1.8 | - | - | - | - | - | - | 1.4 | 2 | 2.2 | 1.6 | |

| | |
|--------------------|---------------------|
| Course Name | Logic Design |
| Course Code | 17ECT33 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C203.1 | Design an optimal solution for a given digital problems using K- Maps. |
| C203.2 | Design combinational digital circuits for the given specifications. |
| C203.3 | Describe the different types of Flip-Flops. |
| C203.4 | Design sequential digital circuits for given specifications. |
| C203.5 | Develop the appropriate Mealy FSM or Moore FSM. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C203.1 | 2 | 3 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 1.875 |
| C203.2 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 | 2 | 2.25 |
| C203.3 | 1 | 2 | 3 | 1 | - | - | - | - | - | - | - | 1 | 2 | 3 | 3 | 2 |
| C203.4 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | 3 | 3 | 2.25 |
| C203.5 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 1 | 3 | 3 | 2 |
| C203 | 1.4 | 2.4 | 2.4 | 1.6 | - | - | - | - | - | - | - | 1.75 | 2 | 2.6 | 2.4 | |

| | |
|--------------------|---------------------|
| Course Name | Field Theory |
| Course Code | 17ECT34 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C204.1 | Describe the basics of vectors, coordinate systems and electrostatics. |
| C204.2 | Discuss the concepts of energy and potential for the boundary conditions. |
| C204.3 | Analyze basic theory of Poisson's and Laplace's equations. |
| C204.4 | Apply the laws and theorems governing magnetic field |
| C204.5 | Apply the Maxwell's equations and relationship between maxwell's equations and uniform plane wave. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|------|------|------|--------------|
| C204.1 | 2 | 3 | - | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | 1.833 |
| C204.2 | 2 | 3 | 2 | 2 | - | 1 | - | - | - | - | - | - | 2 | 3 | 2 | 2 |
| C204.3 | 2 | 1 | 2 | 3 | - | 1 | - | - | - | - | 2 | - | 3 | 3 | 1 | 2.16 |
| C204.4 | 2 | 3 | 3 | 1 | - | 2 | - | - | - | - | - | - | 2 | 2 | 1 | 2.33 |
| C204.5 | 2 | 2 | 3 | 2 | 2 | - | 2 | - | - | - | - | 2 | 1 | 1 | 2 | 2.5 |
| C204 | 2 | 2.6 | 2.5 | 1.8 | 2 | 1.33 | 2 | - | - | - | 2 | 2 | 2 | 2.2 | 1.4 | |

| | |
|--------------------|------------------------------|
| Course Name | Network Analysis (IC) |
| Course Code | 17ECI35 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C205.1 | Analyze the concepts of loop and nodal analysis to various electrical circuits |
| C205.2 | Evaluate circuits using network topology. |
| C205.3 | Design various network theorems to simplify circuits. |
| C205.4 | Design resonant circuit modules and analyze the transient behavior of RLC circuits |
| C205.5 | Analyze the circuits using two port parameters |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C205.1 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 3 | 2 | 1 | 2.28 |
| C205.2 | 2 | 3 | 3 | 2 | - | - | - | - | 1 | - | - | - | 2 | 3 | 1 | 2.12 |
| C205.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 3 | 2 | 2.22 |
| C205.4 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 1 | 3 | 1 | 2.14 |
| C205.5 | 2 | 2 | 3 | 3 | 1 | 1 | - | - | - | 1 | 1 | - | 2 | 3 | 2 | 1.90 |
| C205 | 2 | 2.8 | 2.6 | 2.4 | 1.5 | 1 | - | - | 1.5 | 1 | 1 | - | 2 | 2.8 | 1.4 | |

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|--------------------|---|
| Course Name | Creating Interactive and Responsive Web Pages (IC) |
| Course Code | 17ECI362 |
| Semester | III |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C206.2.1 | Develop web layouts with style sheets and web screens in a presentable form. |
| C206.2.2 | Write interactive web pages through form validations and other methods. Use the same in UI development. |
| C206.2.3 | Use the Java Script libraries to accelerate UI development. |
| C206.2.4 | Design and develop responsive and mobile first web pages. |
| C206.2.5 | Develop applications by using synchronous and asynchronous communication over web. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C206.2.1 | 1 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | 1.57 |
| C206.2.2 | 2 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1.87 |
| C206.2.3 | 2 | 3 | 1 | 1 | 2 | - | - | - | - | - | 2 | - | 1 | 3 | 1 | 1.77 |
| C206.2.4 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | 1.57 |
| C206.2.5 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | 1 | - | 2 | 2 | 1 | 1.62 |
| C206.2 | 1.8 | 1.6 | 1.8 | 1.4 | 2 | - | - | - | - | - | 1.5 | - | 1.8 | 2.2 | 1.2 | |

| | |
|--------------------|---|
| Course Name | Analog Electronics Circuits Laboratory |
| Course Code | 17ECL37 |
| Semester | III |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C207.1 | Design various types of clipping and clamping circuits. |
| C207.2 | Analyze and design different rectifiers. |
| C207.3 | Design BJT amplifier and power amplifier. |
| C207.4 | Design and evaluate Darlington emitter follower. |
| C207.5 | Design and evaluate the performance of various types of oscillators. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C207.1 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | - | 2 | 1 | 2 | 3 | 1 | 2 |
| C207.2 | 2 | 2 | 2 | 3 | - | - | - | - | 2 | - | 2 | 2 | 2 | 3 | 2 | 2.09 |
| C207.3 | 2 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | 1 | 2 | 3 | 1 | 2.18 |
| C207.4 | 2 | 2 | 1 | 2 | 3 | - | - | - | 2 | - | 2 | 1 | 2 | 3 | 1 | 2.27 |
| C207.5 | 2 | 1 | 2 | 2 | 1 | - | - | - | 2 | - | 1 | 2 | 2 | 3 | 1 | 2.36 |
| C207 | 2.2 | 2 | 2.2 | 2.2 | 1.75 | - | - | - | 2 | - | 1.8 | 1.4 | 2 | 3 | 1.2 | |

| | |
|--------------------|--------------------------------|
| Course Name | Logic Design Laboratory |
| Course Code | 17ECL38 |
| Semester | III |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C208.1 | Design and analyze simple Boolean expression using basic gates. |
| C208.2 | Design and verification of various Combinational Circuits. |
| C208.3 | Analyze practical application of decoder chip and priority encoder. |
| C208.4 | Evaluate the various Sequential Circuits. |
| C208.5 | Design and analyze various types of registers and counters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C208.1 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 2 | 1 | 2.1818 |
| C208.2 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 3 | 1 | 2.2727 |
| C208.3 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 1 | 3 | 2 | 2.2727 |
| C208.4 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 1 | 2 | 2.1818 |
| C208.5 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 2 | 2 | 2 | 2.27 |
| C208 | 1 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 2 | - | 1.8 | 2.2 | 1.6 | |

| | |
|--------------------|--|
| Course Name | Integrated Rural Development – Part 1 |
| Course Code | 17ECH39 |
| Semester | III |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C209.1 | Develop the ability to interact and communicate with different sections of society thus improving their communication skills |
| C209.2 | Understand the existing problems and needs of a village, thus |
| C209.3 | Conceptualize plan realize measures to address these problems, thus improving their partial problem solving and leadership skills |
| C209.4 | Make an impact to rural section of society, thus building their self confidence |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PS O3 | CO weigh tage |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|--------------|----------------------|
| C209 .1 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1.76 |
| C209 .2 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1.61 |
| C209 .3 | - | 1 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1.61 |
| C209 .4 | - | 2 | 2 | 1 | - | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1.69 |
| C209 | 1.75 | 2 | 1 | 1 | - | 1.75 | 1.25 | 2 | 2 | 2 | 2 | 1.5 | 1.5 | 1 | 1.75 | |

| | |
|--------------------|--|
| Course Name | Engineering Mathematics-IV (IC) |
| Course Code | 17ECM41 |
| Semester | IV |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C210.1 | Determine the Differentiation, Integration using numerical methods. |
| C210.2 | Solve the differentiation and integrals of complex functions. |
| C210.3 | Find the differentiation and integrals of complex functions |
| C210.4 | Find the probability using different distributions and analysis by using samplings |
| C210.5 | Use the statistical software's. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| C210.1 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 3 | 3 | 1 | 2 |
| C210.2 | 2 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 | 1.87 |
| C210.3 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | - | 2 | - | 3 | 2 | 2 | 2 |
| C210.4 | 3 | 2 | 3 | 1 | 3 | - | - | - | - | - | 3 | - | 2 | 1 | 1 | 2.11 |
| C210.5 | 3 | 3 | 2 | 1 | 2 | - | - | - | - | - | 1 | - | 2 | 2 | 1 | 1.8 |
| C210 | 2.4 | 2.8 | 2.2 | 1 | 1.8 | - | - | - | - | - | 2 | - | 2.4 | 2 | 1.2 | |

| | |
|--------------------|-----------------------|
| Course Name | Microprocessor |
| Course Code | 17ECT42 |
| Semester | IV |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C211.1 | Describe the architecture of 8086. |
| C211.2 | Analyze the appropriate usage of instructions in programming. |
| C211.3 | Develop the interfacing programs with various interfaces. |
| C211.4 | Analyze the appropriate algorithms for solving problems in math coprocessor. |
| C211.5 | Distinguish various advanced processors. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO |
|---------------|-----|-----|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| C211.1 | 3 | 2 | 2 | - | 2 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2.09 |
| C211.2 | 2 | 2 | - | - | - | 2 | 1 | - | - | - | 2 | 2 | 2 | 3 | 2 | 2 |
| C211.3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | - | - | - | 2 | 2 | 3 | 1 | 1 | 2.41 |
| C211.4 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2.41 |
| C211.5 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 1 | 1 | 1 | 2.23 |
| C211 | 2.8 | 2.4 | 2.75 | 3 | 2.5 | 2.4 | 2 | - | - | 2 | 2 | 2.2 | 2 | 1.8 | 1.6 | |

| | |
|--------------------|----------------------------|
| Course Name | Fundamentals of HDL |
| Course Code | 17ECT43 |
| Semester | IV |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C212.1 | Describe the various descriptions in VHDL and Verilog. |
| C212.2 | Develop program using data flow and behavioral descriptions. |
| C212.3 | Develop program using structural and mixed language description. |
| C212.4 | Develop programs using procedure, task, and function. |
| C212.5 | Analyze and synthesis VHDL and VERILOG codes for digital circuits. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|------|------|------|------|--------------|
| C212.1 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | 2 |
| C212.2 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1.83 |
| C212.3 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1.83 |
| C212.4 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1.83 |
| C212.5 | 1 | 2 | 3 | 1 | 2 | - | - | - | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1.66 |
| C212 | 1.2 | 2 | 3 | 1.8 | 2.75 | - | - | - | 2.75 | 2 | 1 | 1 | 1.6 | 1.8 | 1 | |

| | |
|--------------------|----------------------------|
| Course Name | Signals and Systems |
| Course Code | 17ECT44 |
| Semester | IV |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C213.1 | Discriminate various elementary signals and identify the properties of systems. |
| C213.2 | Compute convolution operation on continuous and discrete time signals and express difference and differential equations as block diagram. |
| C213.3 | Express the signals using Fourier transform and apply their properties for solving differential and difference equation. |
| C213.4 | Analyze Z transforms and inverse Z transforms using various methods. |
| C213.5 | Analyze LTI systems using Z transforms. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C213.1 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 1 | 1.87 |
| C213.2 | 2 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | 1 | 1 | 1 | 2 | 1.9 |
| C213.3 | 2 | 2 | 2 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 | 1.66 |
| C213.4 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 1 | 1.66 |
| C213.5 | 2 | 3 | 2 | 2 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 | 1.8 |
| C213 | 2 | 2.6 | 2.2 | 2 | 1.3 | - | - | - | - | - | 1.5 | 1 | 1.8 | 1.6 | 1.4 | |

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|--------------------|----------------------------------|
| Course Name | Fundamentals of VLSI (IC) |
| Course Code | 17ECI452 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C214.2.1 | Describe the fabrication process and VLSI design flow. |
| C214.2.2 | Discuss V-I and C-V characteristics of MOSFETS. |
| C214.2.3 | Analyze sequential and combinational logic circuits using CMOS. |
| C214.2.4 | Discuss the concepts of testing and dynamic CMOS circuits. |
| C214.2.5 | Describe the concepts of low power VLSI design. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO |
|-----------------|-----|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| C214.2.1 | 2 | 2 | 1 | 1 | 3 | - | - | - | - | - | 3 | - | 2 | 2 | 1 | 1.88 |
| C214.2.2 | 2 | - | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 | 2 | 1 | 1.42 |
| C214.2.3 | 1 | 3 | 3 | 2 | 2 | - | - | - | - | - | 2 | - | 2 | 1 | 1 | 1.88 |
| C214.2.4 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | 3 | - | 1 | 2 | 1 | 2.12 |
| C214.2.5 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | 1 | - | 2 | 2 | 1 | 1.37 |
| C214.2 | 1.8 | 2.25 | 1.8 | 1.4 | 2.5 | - | - | - | - | - | 2.2 | - | 1.6 | 1.8 | 1 | |

| | |
|--------------------|---|
| Course Name | Object Oriented Programming with C++ |
| Course Code | 16ECT462 |
| Semester | IV |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C215.2.1 | Apply the concepts of Object-Oriented Programming. |
| C215.2.2 | Implement the concepts of classes and objects. |
| C215.2.3 | Apply the concepts of inheritance to solve complex problems. |
| C215.2.4 | Implement mechanism of virtual function and polymorphism. |
| C215.2.5 | Develop generic function to perform different operations on different data types and implement exception handling. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO |
|-----------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|----------|
| C215.2.1 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | 1.714286 |
| C215.2.2 | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 | 2.125 |
| C215.2.3 | 2 | 3 | 3 | 1 | 2 | - | - | - | - | - | 2 | - | 2 | 1 | 1 | 1.888889 |
| C215.2.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 1 | 1.75 |
| C215.2.5 | 2 | 3 | 2 | 1 | 2 | - | - | - | - | - | 1 | - | 2 | 1 | 1 | 1.666667 |
| C215.2 | 2.6 | 2.4 | 1.8 | 1.2 | 1.75 | - | - | - | - | - | 1.5 | - | 2.2 | 1.6 | 1.2 | |

| | |
|--------------------|-----------------------------------|
| Course Name | Microprocessors Laboratory |
| Course Code | 17ECL47 |
| Semester | IV |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C216.1 | Develop the program for data transfer. |
| C216.2 | Develop arithmetic logical and bit manipulation Assembly level programs. |
| C216.3 | Develop programs to understand branch and looping instruction. |
| C216.4 | Analyze the usage of appropriate interrupts in programming and interfacing. |
| C216.5 | Analyze and interface the peripherals using assembly level language. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| C216.1 | 3 | 2 | 2 | 2 | 2 | - | - | - | 2 | - | 2 | 2 | 2 | 2 | 2 | 2.09 |
| C216.2 | 2 | 2 | 3 | 3 | 2 | - | - | - | 2 | - | 2 | 2 | 2 | 3 | 2 | 2.27 |
| C216.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | 3 | - | 3 | 2 | 3 | 1 | 1 | 2.18 |
| C216.4 | 2 | 2 | 3 | 2 | 2 | - | - | - | 2 | - | 2 | 2 | 2 | 2 | 2 | 2.09 |
| C216.5 | 2 | 3 | 3 | 3 | 2 | - | - | - | 2 | - | 3 | 2 | 1 | 1 | 1 | 2.09 |
| C216 | 2.2 | 2.4 | 2.6 | 2.4 | 2 | - | - | - | 2.2 | - | 2.4 | 2 | 2 | 1.8 | 1.6 | |

| | |
|--------------------|-----------------------|
| Course Name | HDL Laboratory |
| Course Code | 17ECL48 |
| Semester | IV |

| CO. No. | Statements |
|----------------|--|
| | On completion of this course, students will be able to: |
| C217.1 | Develop HDL programs for Logic gates. |
| C217.2 | Develop HDL programs for combinational designs. |
| C217.3 | Develop HDL programs for sequential designs. |
| C217.4 | Develop HDL programs for various counters. |
| C217.5 | Analyze and Interface with various electrical components. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|
| C217.1 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | 2 | 2 | 1 | 2.12 |
| C217.2 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1.83 |
| C217.3 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1.83 |
| C217.4 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1.83 |
| C217.5 | 1 | 2 | 3 | 1 | 2 | - | - | - | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1.66 |
| C217 | 1.2 | 2 | 3 | 1.8 | 2.8 | - | - | - | 2.75 | 2 | 1 | 1 | 1.6 | 1.8 | 1 | |

| | |
|--------------------|--|
| Course Name | Integrated Rural Development – Part 2 |
| Course Code | 17ECH49 |
| Semester | IV |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C218.1 | Further develop their social and communication skills by interacting with residents of the village their team |
| C218.2 | Conceptualize long term solution to challenge in villages, thus developing a sense of entrepreneurship |
| C218.3 | Make an impact to rural section of society, thus building their self confidence |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|
| C218.1 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1.95 |
| C218.2 | - | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1.94 |
| C218.3 | - | 2 | 1 | 2 | - | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1.99 |
| C218 | - | 1.6 | 1.3 | 1.3 | - | 2 | 1 | 2 | 2 | 2 | 2 | 1.6 | 1.3 | 1.3 | 2 | |

| | |
|--------------------|------------------------------|
| Course Name | Communication Systems |
| Course Code | 17ECT51 |
| Semester | V |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C301.1 | Determine the generation and demodulation of AM and DSBSC systems. |
| C301.2 | Understand the generation and demodulation of SSB, VSB and employ AM radio system. |
| C301.3 | Describe the direct and indirect method of generation of FM. |
| C301.4 | Evaluate the FM radio systems and its detection. |
| C301.5 | Analyze the noise performance of receivers. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C301.1 | 3 | 1 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 2 | 1 | 1.77 |
| C301.2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 3 | 2 | 2.25 |
| C301.3 | 2 | 1 | 3 | 2 | - | - | - | - | - | - | 2 | 1 | 2 | 2 | 1 | 1.77 |
| C301.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1.44 |
| C301.5 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 2 | 2 | 1 | 1.77 |
| C301 | 2.4 | 1.6 | 1.8 | 2 | 2 | - | - | - | - | - | 1.5 | 1.4 | 2 | 2 | 1.2 | |

| | |
|--------------------|-------------------------|
| Course Name | Microcontrollers |
| Course Code | 17ECT52 |
| Semester | V |

| CO. No. | Statements |
|----------------|---|
| | On completion of this course, students will be able to: |
| C302.1 | Solve basic binary math operations using the microcontroller. |
| C302.2 | Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target Microcontroller. |
| C302.3 | Analyze program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program. |
| C302.4 | Apply knowledge of the microcontroller's internal registers and operations by use of a PC based microprocessor Simulator and write assemble assembly language programs. |
| C302.5 | Design electrical circuitry to the microcontroller I/O ports in order to interface the processor to external devices. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | Co Weightatge |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------|
| C302.1 | 3 | 2 | 3 | 1 | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 | 1.9 |
| C302.2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | 2 | 2 | 3 | 1 | 1 | 1.77 |
| C302.3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 | 1.888 |
| C302.4 | 3 | 2 | 2 | 3 | 1 | - | - | - | - | - | 2 | 2 | 3 | 2 | 2 | 2.2 |
| C302.5 | 3 | 1 | 3 | 3 | 2 | - | - | - | - | - | 3 | 2 | 3 | 2 | 1 | 2.3 |
| C302 | 2.8 | 1.6 | 2.6 | 2 | 1.33 | - | - | - | - | - | 2.2 | 2 | 2 | 1.6 | 1.2 | |

| | |
|--------------------|--------------------------------------|
| Course Name | Information Theory and Coding |
| Course Code | 17ECT53 |
| Semester | V |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C303.1 | Compute entropy and information rate of a source. |
| C303.2 | Encode the source output using encoding algorithms and coding techniques. |
| C303.3 | Determine the channel capacity of different channels and also the mutual information |
| C303.4 | Implement the error control coding, methods of controlling errors and Error correction and detection. |
| C303.5 | Encode using bit shift register, syndrome calculate and complete knowledge of BCH and burst error correcting codes. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C303.1 | 3 | 3 | 2 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 3 | 2 | 1 | 1.72 |
| C303.2 | 3 | 3 | 3 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 2 | 3 | 1 | 1.81 |
| C303.3 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 3 | 3 | 1 | 1.8 |
| C303.4 | 3 | 3 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 3 | 1 | 1.8 |
| C303.5 | 3 | 3 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 3 | 3 | 2 | 2 |
| C303 | 3 | 2.8 | 2.2 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 2.6 | 2.8 | 1.2 | |

| | |
|--------------------|-----------------------------|
| Course Name | Control Systems (IC) |
| Course Code | 17ECI541 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C304.1.1 | Employ mathematical modelling techniques to determine the transfer function of a given system. |
| C304.1.2 | Analyze the time response of first and second order systems for different test input signals. |
| C304.1.3 | Apply the concept of RH criterion and Nyquist criterion to determine the stability of a given transfer functions. |
| C304.1.4 | Interpret the concept of root locus to determine the stability of a given transfer function. |
| C304.1.5 | Know the frequency domain specification fundamentals and sketch a Bode plot to analyze Stability of a given systems and able to write state model for the given system. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C304.1.1 | 3 | 3 | 2 | 2 | - | 1 | - | - | - | - | - | 1 | 3 | 2 | 1 | 2 |
| C304.1.2 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 2 | 2 | 2 | 3 | 1 | 2 |
| C304.1.3 | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | 1 | 1 | 3 | 3 | 1 | 2.1 |
| C304.1.4 | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | 1 | 1 | 2 | 3 | 1 | 2 |
| C304.1.5 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 3 | 3 | 2 | 2 |
| C304.1 | 2.6 | 2.2 | 2.4 | 2.4 | 2 | 1 | - | - | - | - | 1.25 | 1.2 | 2.6 | 2.8 | 1.2 | |

| | |
|--------------------|-----------------------------------|
| Course Name | Low Power VLSI Design (IC) |
| Course Code | 17ECI542 |
| Semester | V |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C304.2.1 | Distinguish between different types of MOSFET devices. |
| C304.2.2 | Analyze different principles of low power VLSI design |
| C304.2.3 | Apply the concept of transistor sizing for synthesis of low power. |
| C304.2.4 | Design and test of low-voltage CMOS circuits |
| C304.2.5 | Estimate the power consumption of VLSI circuits & optimize it |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C304.2.1 | 2 | 1 | 2 | 3 | - | - | - | - | - | - | 2 | 1 | 3 | 2 | 1 | 1.88 |
| C304.2.2 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 | 1.88 |
| C304.2.3 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | 2 | 1 | 3 | 3 | 1 | 1.77 |
| C304.2.4 | 2 | 2 | 3 | 3 | - | - | - | - | - | - | 2 | 1 | 2 | 1 | 1 | 1.88 |
| C304.2.5 | 3 | 2 | 2 | 3 | - | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 | 2.33 |
| C304.2 | 2.4 | 1.8 | 1.8 | 2.4 | - | - | - | - | - | - | 2.2 | 1.4 | 2.4 | 2 | 1.2 | |

| | |
|--------------------|---|
| Course Name | Digital System Design using Verilog (IC) |
| Course Code | 17ECI551 |
| Semester | V |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C305.1.1 | Analyze and verify various combinational circuits. |
| C305.1.2 | Discuss number basics and sequential basics in Verilog. |
| C305.1.3 | Analyze the appropriate usage of instructions and data types. |
| C305.1.4 | Analyze various I/O interfacings and software. |
| C305.1.5 | Describe and verify accelerators and design methodologies. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C305.1.1 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 3 | 2 | 1 | 2.1 |
| C305.1.2 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 1 | 2 | 2 | 1 | 2.1 |
| C305.1.3 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 | 2.3 |
| C305.1.4 | 2 | 2 | 2 | 3 | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 | 1.9 |
| C305.1.5 | 2 | 1 | 2 | 3 | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 1.9 |
| C305.1 | 2 | 2.2 | 2.4 | 2.4 | 2.2 | - | - | - | - | - | 2 | 1.8 | 2.4 | 2 | 1.2 | |

| | |
|--------------------|---------------------|
| Course Name | Mechatronics |
| Course Code | 17ECT561 |
| Semester | V |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C306.1.1 | Design and conduct experiments to evaluate the performance of a mechatronics system |
| C306.1.2 | Design mechatronics component, system or process to meet desired needs |
| C306.1.3 | Use the techniques, skills, and modern mechatronics engineering tools necessary for engineering practice. |
| C306.1.4 | Identify and evaluate ethical ramifications and professional responsibilities in a variety of situations |
| C306.1.5 | Discuss the impact of engineering on society, safety, and environment in relation to contemporary issues |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C306.1.1 | 1 | 1 | 2 | 1 | 3 | - | - | - | - | - | 3 | - | 2 | 2 | 1 | 1.77 |
| C306.1.2 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | 3 | - | 2 | 2 | 1 | 1.87 |
| C306.1.3 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | 2 | - | 1 | 1 | 1 | 1.75 |
| C306.1.4 | 2 | 2 | 1 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 | 1.55 |
| C306.1.5 | 1 | 2 | 2 | 3 | - | - | - | - | - | - | 1 | - | 2 | 1 | 1 | 1.62 |
| C306.1 | 1.6 | 1.6 | 2 | 2 | 2 | - | - | - | - | - | 2.2 | - | 1.8 | 1.4 | 1 | |

| | |
|--------------------|----------------------------|
| Course Name | Microcontroller Lab |
| Course Code | 17ECL57 |
| Semester | V |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C307.1 | Understand data moving and exchange programs. |
| C307.2 | Analyze and write delay programs. |
| C307.3 | Interface Stepper motor, DC motor to the microcontroller. |
| C307.4 | Discuss seven segment display and keyboard interface. |
| C307.5 | Analyze different types of code conversion programs. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C307.1 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | 3 | 2 | 2 | 2 | 1 | 2.4 |
| C307.2 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 3 | 2 | 3 | 1 | 1 | 2.3 |
| C307.3 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 3 | 3 | 2 | 1 | 1 | 2.2 |
| C307.4 | 2 | 2 | 3 | 3 | 3 | - | - | - | - | - | 3 | 2 | 3 | 2 | 2 | 2.5 |
| C307.5 | 3 | 1 | 3 | 3 | 1 | - | - | - | - | - | 3 | 2 | 3 | 2 | 1 | 2.2 |
| C307 | 2.4 | 2.2 | 3 | 2.6 | 2.4 | - | - | - | - | - | 3 | 2.2 | 2 | 1.6 | 1.2 | |

| | |
|--------------------|---------------------------------|
| Course Name | Communication System Lab |
| Course Code | 17ECL58 |
| Semester | V |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C308.1 | Demonstrate second order active filters for various frequency bands |
| C308.2 | Understand the design and implementation concept for modulation and demodulation circuit using amplitude modulation. |
| C308.3 | Understand the design and implementation concept for modulation circuit using frequency modulation |
| C308.4 | Analyze the circuit by conducting the precision rectifiers experiment |
| C308.5 | Construct the circuit and demonstrate the characteristics of pre-emphasis and de-emphasis circuit. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C308.1 | 3 | 1 | 2 | 1 | 3 | - | - | - | 3 | - | 3 | 1 | 2 | 2 | 1 | 2 |
| C308.2 | 2 | 2 | 2 | 2 | - | - | - | - | 3 | - | 2 | 2 | 3 | 1 | 1 | 2 |
| C308.3 | 2 | 1 | 3 | 2 | - | - | - | - | 3 | - | 2 | 2 | 2 | 1 | 1 | 1.9 |
| C308.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | 3 | - | 2 | 2 | 3 | 2 | 2 | 2.09 |
| C308.5 | 2 | 2 | 1 | 3 | - | - | - | - | 3 | - | 1 | 1 | 3 | 2 | 1 | 1.9 |
| C308 | 2.4 | 1.6 | 1.8 | 2 | 2 | - | - | - | 3 | - | 2 | 1.6 | 2 | 2 | 1 | |

| | |
|--------------------|-------------------------|
| Course Name | General Aptitude |
| Course Code | 17ECH59 |
| Semester | V |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C309.1 | Solve and analyze different types of Numerical / Arithmetical problems. |
| C309.2 | Solve and analyze different Data interpretation problems. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C309.1 | 1 | 3 | 3 | 2 | - | - | - | - | 2 | 2 | - | 2 | 3 | 3 | 3 | 2.4 |
| C309.2 | 1 | 3 | 2 | 2 | 2 | - | - | - | 1 | 3 | - | 2 | 3 | 3 | 3 | 2.272727 |
| C309 | 1 | 3 | 2.5 | 2 | 2 | - | - | - | 1.5 | 2.5 | - | 2 | 3 | 3 | 3 | |

| | |
|--------------------|----------------------------------|
| Course Name | Digital Signal Processing |
| Course Code | 17ECT61 |
| Semester | VI |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C310.1 | Implement DFT using linear filtering. |
| C310.2 | Implement DFT using Fast Fourier Transforms. |
| C310.3 | Design and analyze digital FIR filters and structure of FIR filters. |
| C310.4 | Design and analyze digital IIR filters and structure of IIR filters. |
| C310.5 | Explain the concept of Multi-rate signal processing and sample rate conversion. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C310.1 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 | 2 |
| C310.2 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 2 | 1 | 2 |
| C310.3 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 1 | 1 | 1 | 2 |
| C310.4 | 2 | 3 | 3 | 2 | 3 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 | 2.1 |
| C310.5 | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 1 | 1 | 1.3 |
| C310 | 2.4 | 2.2 | 2.4 | 1.8 | 2.2 | - | - | - | - | - | 1.8 | 1.8 | 1.8 | 1.4 | 1 | |

| | |
|--------------------|------------------------------|
| Course Name | Digital Communication |
| Course Code | 17ECT62 |
| Semester | VI |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C311.1 | Sample a signal and reconstruct it at receiver. |
| C311.2 | Design a PCM, DPCM, DM and ADM systems. |
| C311.3 | Design Base Band shaping for data transmission. |
| C311.4 | Describe system level blocks for BPSK, ASK, DPSK and QPSK systems. |
| C311.5 | Analyze coherent and no-coherent digital modulation systems and understand the basics of spread spectrum technology. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C311.1 | 3 | 2 | 2 | 1 | 3 | - | - | - | - | - | 3 | 1 | 2 | 3 | 1 | 2.1 |
| C311.2 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 1 | 3 | 2 | 2 | 2.11 |
| C311.3 | 3 | 1 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 3 | 2 | 1 | 2.11 |
| C311.4 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 1 | 1 | 1.66 |
| C311.5 | 3 | 2 | 2 | 3 | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 1 | 1.88 |
| C311 | 3 | 1.8 | 2 | 2 | 3 | - | - | - | - | - | 1.8 | 1.4 | 2.4 | 2 | 1.2 | |

| | |
|--------------------|-------------------------------------|
| Course Name | Antenna and Propagation (IC) |
| Course Code | 17ECI631 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C312.1.1 | Describe the basic parameters of antenna. |
| C312.1.2 | Discuss the concepts of aperture and slot antenna. |
| C312.1.3 | Analyze antenna arrays. |
| C312.1.4 | Understand the concept and principle of special antennas. |
| C312.1.5 | Understand the propagation of radio waves. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C312.1.1 | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | 1 | 2 | 3 | 1 | 2.25 |
| C312.1.2 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 1.75 |
| C312.1.3 | 2 | 3 | 1 | 2 | - | - | - | - | - | - | 2 | 1 | 3 | 2 | 1 | 1.88 |
| C312.1.4 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 1.875 |
| C312.1.5 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 | 2 |
| C312.1 | 2.2 | 2.6 | 1.6 | 2.4 | - | - | - | - | - | - | 1.5 | 1.4 | 2.2 | 2.2 | 1.2 | |

| | |
|--------------------|------------|
| Course Name | PBL |
| Course Code | 17ECT644 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C313.4.1 | Demonstrate proficient knowledge on the concepts involved. |
| C313.4.2 | Identify the problem and propose the possible solution through literature survey |
| C313.4.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C313.4.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C313.4 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C313.4.1 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | - | 1 | 1 | 2 | 2 | 2 |
| C313.4.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 | 1.615385 |
| C313.4.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 | 2.153846 |
| C313.4.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 | 2 |
| C313.4.5 | 3 | 1 | - | - | - | - | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 | 1.5 |
| C313.4 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 | |

| | |
|--------------------|--------------------------------------|
| Course Name | Digital Signal Processing Lab |
| Course Code | 17ECL65 |
| Semester | VI |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C314.1 | Implement circular and section convolution. |
| C314.2 | Implement linear convolution and circular convolution using DFT and IDFT. |
| C314.3 | Implement digital FIR filter to meet the given specifications. |
| C314.4 | Implement digital IIR filters to meet the given specification. |
| C314.5 | Implement convolution and filtering using DSP processor. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C314.1 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1 | 2 | 2 | 2 | 2 |
| C314.2 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1 | 1 | 2 | 2 | 1.9 |
| C314.3 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 | 1.9 |
| C314.4 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | 1 | 1 | 1.9 |
| C314.5 | 3 | 2 | 2 | 2 | 3 | - | - | - | - | - | 3 | 2 | 1 | 1 | 1 | 2 |
| C314 | 2.2 | 2.8 | 2 | 2 | 2.2 | - | - | - | - | - | 2.2 | 1.6 | 1.6 | 1.4 | 1.2 | |

| | |
|--------------------|--------------------------|
| Course Name | LabVIEW - Level I |
| Course Code | 17HOE661 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C315.1.1 | Formulate basic aspects of the graphical programming using LabVIEW 2016. |
| C315.1.2 | Develop LabVIEW coding for a specific problem of datalogging, measurement and presentation. |
| C315.1.3 | Handle the error function and errors in the LabVIEW coding. |
| C315.1.4 | Develop coding for data handling and Analysis on the acquired data. |
| C315.1.5 | Design a state machine LabVIEW coding for an applied problem. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------|
| C315.1.1 | 3 | 2 | 2 | 3 | 3 | - | - | - | - | - | 1 | - | 2 | 2 | 2 | 2.22 |
| C315.1.2 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | - | 1 | 2 | 1 | 2 |
| C315.1.3 | 2 | 2 | 2 | 2 | 3 | - | - | - | - | - | 2 | - | 1 | 1 | 1 | 1.77 |
| C315.1.4 | 2 | 3 | 2 | 3 | 3 | - | - | - | - | - | 1 | - | 2 | 1 | 1 | 2 |
| C315.1.5 | 3 | 2 | 3 | 3 | 3 | - | - | - | - | - | 1 | - | 1 | 1 | 1 | 2 |
| C315.1 | 2.4 | 2.2 | 2.4 | 2.6 | 3 | - | - | - | - | - | 1.4 | - | 2 | 1.4 | 1.2 | |

| | |
|--------------------|----------------------------|
| Course Name | Yoga and Meditation |
| Course Code | 17HOE662 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.2.1 | Know the basic principles of Yoga. |
| C315.2.2 | Know and practice the basic asanas and their benefits. |
| C315.2.3 | Use Pranayama and Meditation for improving health and mental peace. |
| C315.2.4 | Know the difference between meditation and concentration. |
| C315.2.5 | Apply the principles of Ayurveda and implement them for one's benefit. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C315.2.1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 | - | 3 | - | - | 3 | 2.42 |
| C315.2.2 | - | - | - | - | 3 | 3 | 1 | 2 | 2 | 2 | - | 3 | - | 1 | 3 | 2.125 |
| C315.2.3 | - | - | - | - | - | 1 | 2 | 2 | 1 | 3 | - | 2 | - | 1 | 3 | 1.875 |
| C315.2.4 | - | - | - | - | - | 2 | 2 | 2 | 3 | 1 | - | 2 | - | - | 3 | 2.14 |
| C315.2.5 | - | - | - | - | - | 2 | 2 | 1 | 2 | - | - | 21 | - | - | 3 | 5.16 |
| C315.2 | - | - | - | - | 3 | 2.2 | 1.8 | 1.8 | 2 | 1.67 | - | 6.2 | - | 1 | 3 | |

| | |
|--------------------|---------------------|
| Course Name | Martial Arts |
| Course Code | 17HOE663 |
| Semester | VI |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C315.3.1 | Demonstrate a grasp of the various Martial Arts' notion of "self-cultivation" and be able to relate it to their own personal growth |
| C315.3.2 | Demonstrate the practical leadership skills and intercultural literacy needed to assume entry level leadership positions in business, government, and in civil society |
| C315.3.3 | Develop appreciation of diversity in the world and in intellectual areas such as but not limited to the humanities and the social sciences. |
| C315.3.4 | Show the desire and ability to pursue learning throughout life |
| C315.3.5 | Demonstrate strong written and oral communication skills |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C315.3.1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 | - | 3 | - | - | 3 | 2.42 |
| C315.3.2 | - | - | - | - | - | 3 | 1 | 2 | 2 | 2 | - | 3 | - | 1 | 3 | 2.125 |
| C315.3.3 | - | - | - | - | - | 1 | 2 | 2 | 1 | 3- | - | 2 | - | 1 | 3 | 1.716 |
| C315.3.4 | - | - | - | - | - | 2 | 2 | 2 | 3 | 1 | - | 2 | - | - | 3 | 2.14 |
| C315.3.5 | - | - | - | - | - | 2 | 2 | 1 | 2 | - | - | 21 | - | - | 3 | 5.16 |
| C315.3 | - | - | - | - | - | 2.2 | 1.8 | 1.8 | 2 | 1.67 | - | 6.2 | - | 1 | 3 | |

| | |
|--------------------|----------------------------------|
| Course Name | Digital Communication Lab |
| Course Code | 17ECL67 |
| Semester | VI |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C316.1 | Implement ASK, PSK and FSK. |
| C316.2 | Implement TDM using optical fiber. |
| C316.3 | Demonstrate the QPSK generation. |
| C316.4 | Realize the design theory concept using software. |
| C316.5 | Analyze and understand the outputs by changing the important parameters. |

| S COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C316.1 | 2 | 1 | 2 | 1 | 3 | - | - | - | - | - | 2 | 1 | 2 | 3 | 2 | 1.89 |
| C316.2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 | 2.12 |
| C316.3 | 2 | 1 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 | 2.12 |
| C316.4 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | 2 | 2 | 3 | 3 | 1 | 1.9 |
| C316.5 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 2 | 3 | 2 | 2 |
| C316 | 2.2 | 1.6 | 1.8 | 2 | 2 | - | - | - | - | - | 1.8 | 1.8 | 2.6 | 3 | 1.4 | |

| | |
|--------------------|----------------------------------|
| Course Name | Technical Aptitude and GD |
| Course Code | 17ECH68 |
| Semester | VI |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C317.1 | Solve and analyze different types of numerical/arithmetical problems. |
| C317.2 | Solve and analyze different data interpretation problems. |
| C317.3 | Acquire satisfactory competency in the use of numerical ability. |
| C317.4 | Understand the basic concepts of logical reasoning. |
| C317.5 | Compete in various competitive exams. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C317.1 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 | 2 | 2.16 |
| C317.2 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | 3 | 3 | 3 | 2.33 |
| C317.3 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | - | 3 | 2 | 2 | 1.85 |
| C317.4 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | 3 | 3 | 2 | 2.16 |
| C317.5 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 3 | 3 | 2 | 2 |
| C317 | 1.8 | 2 | 1.2 | - | - | - | - | - | - | - | - | - | 3 | 2.6 | 2.2 | |

| | |
|--------------------|---------------------------------|
| Course Name | Mini project and Seminar |
| Course Code | 17ECP69 |
| Semester | VI |

| CO. No. | Statements |
|---------------|---|
| | On completion of this course, students will be able to: |
| C318.1 | Apply knowledge of electronics and communication, to select topic relevant to theCurrent trends in multidisciplinary engineering domains. |
| C318.2 | Show competence in defining and explaining topics under discussion. |
| C318.3 | Analyze different methodologies, tools and scope for the concept. |
| C318.4 | Use technical resources to study the emerging engineering trends. |
| C318.5 | Write technical report effectively and relate the study and effectively communicate by making an oral presentation. |

| COS POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PS01 | PS02 | PSO 3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|-------|--------------|
| C318.1 | 3 | - | - | - | 1 | 1 | - | - | - | - | - | - | 1 | - | 2 | 1.6 |
| C318.2 | 3 | 1 | - | - | 2 | 1 | 1 | - | - | - | - | - | 2 | 1 | 1 | 1.5 |
| C318.3 | 3 | 2 | - | - | 2 | - | - | - | - | - | - | 2 | 1 | - | 3 | 2.16 |
| C318.4 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | - | - | 1 | 2 | 2 | 2 |
| C318.5 | 2 | - | - | - | - | - | - | - | 1 | 2 | - | - | 1 | - | 2 | 1.6 |
| C318 | 1.8 | 1.3 | - | - | 1 | 2 | 1 | - | 1.5 | 2 | - | 2 | 1.2 | 1.5 | 2 | |

| | |
|--------------------|--------------------------|
| Course Name | Power Electronics |
| Course Code | 17ECT71 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C401.1 | Design drive controls for power semiconductor devices. |
| C401.2 | Analyze the operation of single phase and three phase rectifiers with various loads. |
| C401.3 | Design commutation circuits. |
| C401.4 | Design AC-voltage controllers for different configurations. |
| C401.5 | Analyze the operation of choppers and inverters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C401.1 | 2 | 2 | 2 | 1 | 1 | - | 1 | - | 1 | - | 2 | - | 2 | 3 | 1 | 1.63 |
| C401.2 | 2 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | 2 | - | 3 | 3 | 1 | 2 |
| C401.3 | 2 | 2 | 3 | 2 | 1 | 1 | - | - | - | - | 2 | - | 2 | 3 | 2 | 2 |
| C401.4 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | 2 | - | 2 | 2 | 1 | 1.9 |
| C401.5 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | - | - | - | 2 | - | 2 | 2 | 1 | 1.63 |
| C401 | 2.2 | 2.2 | 2 | 1.8 | 1.4 | 1 | 1 | - | 1 | - | 2 | - | 2.2 | 2.6 | 1.2 | |

| | |
|--------------------|---------------------------|
| Course Name | Data Communication |
| Course Code | 17ECT72 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C402.1 | Describe layers of OSI model and its functions. |
| C402.2 | Discuss the different protocols of Noiseless and Noisy channels. |
| C402.3 | Analyze different types of Ethernet. |
| C402.4 | Distinguish below Virtual and Connecting LANs. |
| C402.5 | Describe the functions of network layer, Transition from Ipv4 to Ipv6. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weight age |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---------------|
| C402.1 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 1.75 |
| C402.2 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 1 | 1.87 |
| C402.3 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 1 | 3 | 2 | 2.12 |
| C402.4 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 2 |
| C402.5 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 | 1 | 2.12 |
| C402 | 2.2 | 2.8 | 2 | 1.8 | - | - | - | - | - | - | - | 2 | 1.8 | 2 | 1.2 | |

| | |
|--------------------|---|
| Course Name | Optical Fiber Communication (IC) |
| Course Code | 17ECI731 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C403.1.1 | Know the fundamental concepts of OFC. |
| C403.1.2 | Analyze the characteristics of Optical Fiber and functions of various Sources and Detectors. |
| C403.1.3 | Describe various Fiber couplers, connectors and analyse Optical receivers. |
| C403.1.4 | Distinguish Analog and Digital Links. |
| C403.1.5 | Discuss concept of WDM, Optical Amplifiers and Optical networks. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C403.1.1 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | - | - | 1 | 2 | 2 | 2 | 2 | 1 | 1.76 |
| C403.1.2 | 3 | 2 | 1 | 1 | - | 1 | - | - | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1.58 |
| C403.1.3 | 3 | 1 | 1 | - | - | 1 | - | - | - | 1 | 1 | 2 | 1 | 3 | 2 | 1.6 |
| C403.1.4 | 3 | 2 | 1 | - | - | 1 | - | - | - | 2 | 1 | 2 | 2 | 2 | 1 | 1.7 |
| C403.1.5 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | 2 | 1 | 2 | 2 | 1 | 1 | 1.46 |
| C403.1 | 3 | 2 | 1.4 | 1 | 1 | 1 | 1 | | 1 | 1.4 | 1.4 | 2 | 1.8 | 2 | 1.2 | |

| | |
|--------------------|-------------------------------|
| Course Name | Wireless Communication |
| Course Code | 17ECT741 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|--|
| | On completion of this course, students will be able to: |
| C404.1.1 | Describe basics of wireless communication techniques. |
| C404.1.2 | Analyze and describe the fundamentals of cellular concepts. |
| C404.1.3 | Describe mobile radio communication in depth. |
| C404.1.4 | Distinguish between different types of modulation techniques for mobile radio communication. |
| C404.1.5 | Differentiate the types of Multiple Access schemes. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|------|-----|-----|-----|------|-----|------|------|------|------|------|------|-----------------|
| C404.1.1 | 3 | 2 | 2 | - | - | 2 | 1 | 1 | - | 2 | 2 | 1 | 2 | 2 | 1 | 1.75 |
| C404.1.2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | - | - | 2 | 1 | 2 | 2 | 2 | 1 | 1.84 |
| C404.1.3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | - | 2 | 2 | 2 | 1 | 3 | 2 | 1.78 |
| C404.1.4 | 3 | 2 | 1 | - | 3 | 1 | 1 | - | - | 3 | 2 | 2 | 2 | 2 | 1 | 1.91 |
| C404.1.5 | 3 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1.53 |
| C404.1 | 3 | 2 | 2.4 | 1.33 | 1.5 | 1.2 | 1 | 1.33 | 1 | 2.2 | 1.6 | 1.8 | 1.8 | 2 | 1.2 | |

| | |
|--------------------|--|
| Course Name | AUTOMOTIVE EMBEDDED SYSTEM DESIGN |
| Course Code | 17HOE755 |
| Semester | VII |

| CO. No. | Statements |
|----------|---|
| | On completion of this course, students will be able to: |
| C405.5.1 | Design and develop automotive embedded systems |
| C405.5.2 | Analyse various embedded products used in automotive industry. |
| C405.5.3 | Evaluate the opportunities involving technology a product or a service required for developing a start up idea used for automotive applications |
| C405.5.4 | Interface devices and build the complete system. |
| C405.5.5 | Understand the Software and Product Development Life cycle. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C405.5.1 | 2 | 2 | 2 | 3 | 2 | 2 | | - | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1.923077 |
| C405.5.2 | 2 | 3 | 1 | 2 | 3 | 1 | | - | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1.692308 |
| C405.5.3 | 3 | 2 | 2 | 2 | 3 | 2 | | - | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 2.230769 |
| C405.5.4 | 2 | 2 | 1 | 3 | 3 | 1 | | - | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1.692308 |
| C405.5.5 | 3 | 1 | 2 | 3 | 1 | 2 | | - | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 1.769231 |
| C405.5 | 2.4 | 2 | 1.6 | 2.6 | 2.4 | 1.6 | | | 2.4 | 1 | 1.2 | 1.6 | 2 | 2 | 1.4 | |

| | |
|--------------------|---|
| Course Name | Introduction to ARM Processor & Applications |
| Course Code | 17HOE766 |
| Semester | VII |

| CO. No. | Statements |
|-----------------|---|
| | On completion of this course, students will be able to: |
| C406.6.1 | Identify the requirements of an embedded system |
| C406.6.2 | Familiarize with the ARM architecture |
| C406.6.3 | Write programs using ARM instruction set |
| C406.6.4 | Analyze the various ways of handling exceptions and interrupts in ARM processor. |
| C406.6.5 | Develop embedded C programs to interact with various built in peripherals of ARM7 |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C406.6.1 | 2 | 2 | 2 | 3 | 2 | 2 | - | - | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1.92 |
| C406.6.2 | 2 | 3 | 1 | 2 | 3 | 1 | - | - | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1.69 |
| C406.6.3 | 3 | 2 | 2 | 2 | 3 | 2 | - | - | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 2.23 |
| C406.6.4 | 2 | 2 | 1 | 3 | 3 | 1 | - | - | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1.69 |
| C406.6.5 | 3 | 1 | 2 | 3 | 1 | 2 | - | - | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 1.76 |
| C406.6 | 2.4 | 2 | 1.6 | 2.6 | 2.4 | 1.6 | - | - | 2.4 | 1 | 1.2 | 1.6 | 2 | 2 | 1.4 | |

| | |
|--------------------|------------------------------|
| Course Name | Power Electronics Lab |
| Course Code | 17ECL77 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C407.1 | Understand the fundamental concepts of MOSFET, IGBT and SCR. |
| C407.2 | Understand the basics of UJT HWR and FWR. |
| C407.3 | Discuss UJT triggering of SCR. |
| C407.4 | Understand Stepper motor concepts. |
| C407.5 | Describe various types of inverters. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--------------|
| C407.1 | 3 | 1 | 1 | 1 | 2 | 1 | - | - | - | - | 2 | - | 2 | 2 | 1 | 1.6 |
| C407.2 | 3 | 2 | 1 | 1 | 2 | 1 | - | - | - | - | 1 | - | 3 | 2 | 1 | 1.7 |
| C407.3 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | 2 | - | 2 | 1 | 1 | 1.66 |
| C407.4 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | 2 | - | 2 | 2 | 2 | 1.54 |
| C407.5 | 3 | 2 | 2 | 2 | 1 | - | 2 | - | - | - | 2 | - | 2 | 1 | 1 | 1.8 |
| C407 | 3 | 1.6 | 1.4 | 1.2 | 1.4 | 1 | 1.5 | - | - | - | 1.8 | - | 2.2 | 1.6 | 1.2 | |

| | |
|--------------------|-------------------------------|
| Course Name | Data Communication Lab |
| Course Code | 17ECL78 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C408.1 | Understand different data stuffing techniques used in communication. |
| C408.2 | Analyze basic encryption techniques. |
| C408.3 | Discuss spanning tree. |
| C408.4 | Understand serial communication techniques. |
| C408.5 | Describe telnet basics and remote access. |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----------------|
| C408.1 | 3 | 2 | 1 | 1 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1.91 |
| C408.2 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 1 | 3 | 2 | 1 | 2.083 |
| C408.3 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 |
| C408.4 | 2 | 3 | 2 | 2 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2.166 |
| C408.5 | 2 | 3 | 3 | 2 | 3 | - | - | - | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2.166 |
| C408 | 2.2 | 2.8 | 2 | 1.8 | 3 | - | - | - | 2 | 2 | 2 | 2 | 2.2 | 1.6 | 1.2 | |

| | |
|--------------------|------------------------------------|
| Course Name | Project Phase-I and Seminar |
| Course Code | 17ECP79 |
| Semester | VII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C409.1 | Demonstrate proficient knowledge on the concepts involved. |
| C409.2 | . Identify the problem and propose the possible solution through literature survey |
| C409.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C409.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C409.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P010 | P011 | PO12 | PS01 | PS 02 | PS 03 | CO wei ght age |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|----------|----------|-------------------------|
| C409.1 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | - | 1 | 1 | 2 | 2 | 2 |
| C409.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 | 1.6 1 |
| C409.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 | 2.1 5 |
| C409.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 | 2 |
| C409.5 | 3 | 1 | - | - | - | - | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 | 1.5 |
| C409 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 | |

| | |
|--------------------|-------------------------------------|
| Course Name | Project Phase-II and Seminar |
| Course Code | 17ECP81 |
| Semester | VIII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C410.1 | Demonstrate proficient knowledge on the concepts involved. |
| C410.2 | . Identify the problem and propose the possible solution through literature survey |
| C410.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C410.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C410.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| POS COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P010 | P011 | PO12 | PS01 | PS02 | PSO3 | CO weight age |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---------------|
| C410.1 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | - | 1 | 1 | 2 | 2 | 2 |
| C410.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 | 1.6 |
| C410.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 | 2.15 |
| C410.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 | 2 |
| C410.5 | 3 | 1 | - | - | - | - | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 | 1.5 |
| C410 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 | |

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|--------------------|--------------------------------------|
| Course Name | Project Phase-III and Seminar |
| Course Code | 17ECP82 |
| Semester | VIII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C411.1 | Demonstrate proficient knowledge on the concepts involved. |
| C411.2 | . Identify the problem and propose the possible solution through literature survey |
| C411.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C411.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C411.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| POs COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P010 | P011 | PO12 | PS01 | PS02 | PSO3 | CO weight age |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---------------------|
| C411.1 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | - | 1 | 1 | 2 | 2 | 2 |
| C411.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 | 1.61 |
| C411.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 | 2.153 |
| C411.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 | 2 |
| C411.5 | 3 | 1 | - | - | - | - | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 | 1.5 |
| C411 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 | |

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|--------------------|---------------------------------|
| Course Name | Evaluation and Viva-voce |
| Course Code | 17ECP83 |
| Semester | VIII |

| CO. No. | Statements |
|---------------|--|
| | On completion of this course, students will be able to: |
| C412.1 | Demonstrate proficient knowledge on the concepts involved. |
| C412.2 | . Identify the problem and propose the possible solution through literature survey |
| C412.3 | Design and develop engineering solutions to complex problems through systematic approach. |
| C412.4 | Develop prototype/simulation for the proposed solution and articulate the work |
| C412.5 | Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning |

| POs COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P010 | P01 1 | PO12 | PS01 | PS 02 | PSO 3 | CO weightage |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|----------|------|------|----------|----------|-----------------|
| C412.1 | 3 | 2 | - | - | - | - | - | - | 2 | 3 | - | 1 | 1 | 2 | 2 | 2 |
| C412.2 | 3 | 3 | 2 | 1 | - | 1 | 1 | 1 | 2 | 2 | - | 1 | 2 | 1 | 1 | 1.615385 |
| C412.3 | 3 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | - | 1 | 3 | 2 | 2 | 2.156 |
| C412.4 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | - | 1 | 2 | 2 | 2 | 2 |
| C412.5 | 3 | 1 | - | - | - | | 2 | 1 | 3 | 1 | - | 1 | 1 | 1 | 1 | 1.5 |
| C412 | 3 | 2.2 | 2.3 | 1.3 | 2.5 | 1.5 | 1.5 | 1 | 2.6 | 2 | - | 1 | 1.8 | 1.8 | 1.6 | |

Nagarjuna College of Engineering and Technology

Department of Civil Engineering – 2015 Scheme

| Course Name: Engineering Mathematics-III (IC) | |
|---|--|
| Course Code: 15CVM31 | |
| Course outcomes of Engineering Mathematics-III (IC) | |
| Sl. No. | Course Outcomes |
| C201.1 | Form a partial differential equations and their solutions. |
| C201.2 | Expressing the given functions as infinite series and their solutions. |
| C201.3 | Solve the functional and variations problems. |
| C201.4 | Find approximated solutions by numerical methods. |
| C201.5 | Use the SCILAB to solve the various types engineering problems. |

| Course Name: Engineering Mathematics-III (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVM31 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Mathematics-III (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C201.1 | 3 | 3 | 2 | 3 | 2 | | | 2 | 2 | | | 1 | 1 | 3 | 2 |
| C201.2 | 2 | 3 | 2 | 2 | 2 | | | 1 | 1 | | | 1 | 1 | 2 | 3 |
| C201.3 | 2 | 3 | 2 | 3 | 3 | | | 1 | 1 | | | 1 | 1 | 2 | 3 |
| C201.4 | 2 | 3 | 2 | 2 | 3 | | | 1 | 1 | | | 1 | 1 | 3 | 3 |

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|---------------|-----|-----|-----|-----|-----|--|--|-----|-----|--|--|---|---|-----|-----|
| C201.5 | 2 | 2 | 3 | 2 | 3 | | | 1 | 1 | | | 1 | 1 | 3 | 2 |
| C201 | 2.2 | 2.8 | 2.2 | 2.4 | 2.6 | | | 1.2 | 1.2 | | | 1 | 1 | 2.6 | 2.6 |

| Course Name: Building Materials and Concrete Technology | |
|---|--|
| Course Code:15CVT32 | |
| Course outcomes of Building Materials and Concrete Technology | |
| Sl. No. | Course Outcomes |
| C202.1 | Recognize the materials used in construction. |
| C202.2 | Describe the physical and mechanical properties of variety of materials. |
| C202.3 | Identify the functional components of a building. |
| C202.4 | Describe the construction process of various components of a building. |
| C202.5 | Explain the fundamental principles and procedures in repairing concrete. |

| Course Name: Building Materials and Concrete Technology | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT32 | | | | | | | | | | | | | | | |
| POs & PSOs of Building Materials and Concrete Technology | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C202.1 | 3 | 2 | | | | 1 | 1 | | | | | 1 | 3 | 3 | 1 |
| C202.2 | 2 | 1 | 2 | 3 | | 1 | | | | | | | 3 | 3 | 1 |
| C202.3 | 2 | 3 | | 1 | | | 1 | | | | | | 3 | 3 | 1 |

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|---------------|-----|---|---|---|--|---|---|--|--|--|--|---|---|---|---|
| C202.4 | 3 | 2 | 1 | 2 | | | | | | | | 1 | 3 | 3 | 1 |
| C202.5 | 2 | 2 | 3 | | | | 1 | | | | | 1 | 3 | 3 | 1 |
| C202 | 2.4 | 2 | 2 | 2 | | 1 | 1 | | | | | 1 | 3 | 3 | 1 |

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|--|--|
| Course Name: Strength of Materials | |
| Course Code:15CVT33 | |
| Course outcomes of Strength of Materials | |
| Sl. No. | Course Outcomes |
| C203.1 | Describe the fundamental concepts of stress and strain under elastic limits. |
| C203.2 | Analyse SFD and BMD for beams. |
| C203.3 | Determine the buckling loads of a long columns. |
| C203.4 | Determine deflection in beams under different loading conditions. |
| C203.5 | Analyse the bending stress and shear stress in the beams. |

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|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Name: Strength of Materials | | | | | | | | | | | | | | | |
| Course Code: 15CVT33 | | | | | | | | | | | | | | | |
| POs & PSOs of Strength of Materials | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C203.1 | 1 | 3 | 2 | | | | | | | | | | 2 | 3 | 1 |
| C203.2 | 2 | 2 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C203.3 | 1 | 3 | 2 | 2 | | | | | | | | | 3 | 3 | 1 |
| C203.4 | 2 | 3 | 2 | 1 | | | | | | | | | 3 | 3 | 1 |

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|--------|-----|-----|-----|------|--|--|--|--|--|--|--|--|-----|---|---|
| C203.5 | 2 | 3 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C203 | 1.6 | 2.8 | 1.6 | 2.25 | | | | | | | | | 2.8 | 3 | 1 |

| Course Name: Surveying | |
|------------------------------|---|
| Course Code: 15CVT34 | |
| Course outcomes of Surveying | |
| Sl. No. | Course Outcomes |
| C204.1 | Identify the basics involved in different types of surveying like tape, compass, levelling and theodolite/ total station. |
| C204.2 | Recognize the skills in performing measurement of distance, angles and levelling. |
| C204.3 | Develop skills for estimating the strengths between given points, area of a given plot and earth work involved in cutting and fillings. |
| C204.4 | Develop skill to carry out tachometry, geodetic surveying wherever situations demands and curve setting. |
| C204.5 | Apply error adjustment to the recorded reading to get an accurate surveying output. |

| Course Name: Surveying | | | | | | | | | | | | | | | |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT34 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C204.1 | 3 | 3 | 2 | | 3 | 1 | | | 2 | 3 | | 1 | 3 | 3 | 1 |

| | | | | | | | | | | | | | | | |
|--------|---|-----|-----|-----|---|---|--|--|-----|-----|--|-----|---|-----|---|
| C204.2 | 3 | 3 | 1 | 1 | | | | | 2 | 2 | | 1 | 3 | 3 | 1 |
| C204.3 | 3 | 3 | 2 | 1 | 3 | | | | 2 | 2 | | 2 | 3 | 3 | 1 |
| C204.4 | 3 | 3 | 2 | 2 | | | | | 2 | 3 | | 2 | 3 | 3 | 1 |
| C204.5 | 3 | 2 | 1 | | | | | | 1 | 1 | | 1 | 3 | 1 | 1 |
| C204 | 3 | 2.8 | 1.6 | 1.3 | 3 | 1 | | | 1.8 | 2.2 | | 1.4 | 3 | 2.6 | 1 |

| Course Name: Engineering Geology (IC) | |
|---|---|
| Course Code: 15CVI35 | |
| Course outcomes of Engineering Geology (IC) | |
| Sl. No. | Course Outcomes |
| C205.1 | Describe earth and its internal structure to identify natural resources useful for construction |
| C205.2 | Recognize good building materials and their properties |
| C205.3 | Explain earth processes and its effect on engineering construction |
| C205.4 | Effect of geological structure on engineering structure |
| C205.5 | Identify the formation, distribution and conservation of water resources |

| Course Name: Engineering Geology (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVI35 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Geology (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C205.1 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C205.2 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 1 |
| C205.3 | 3 | 2 | | | | 1 | | | | | | | 1 | 3 | 1 |

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|--------|-----|-----|---|-----|--|---|---|--|--|--|--|--|-----|---|-----|
| C205.4 | 2 | 3 | 1 | | | | | | | | | | 2 | 3 | 1 |
| C205.5 | 3 | 2 | | 1 | | | 1 | | | | | | 1 | 3 | 3 |
| C205 | 2.6 | 2.4 | 1 | 1.3 | | 1 | 1 | | | | | | 1.2 | 3 | 1.4 |

| Course Name: Rural Water Supply and Sanitation | |
|--|---|
| Course Code: 15CVT362 | |
| Course outcomes of Rural Water Supply and Sanitation | |
| Sl. No. | Course Outcomes |
| C206a.1 | Identify and select water supply systems in rural areas. |
| C206a.2 | Distinguish between urban and rural water supply systems. |
| C206a.3 | Categorize the different types of water borne, communicable diseases and apply the principles of rainwater harvesting. |
| C206a.4 | Explain overall management of rural water supply and other components like milk sanitation. |
| C206a.5 | Examine overall management of solid waste collection, disposal and other components like composting of waste to energy. |

| Course Name: Rural Water Supply and Sanitation | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT362 | | | | | | | | | | | | | | | |
| POs & PSOs of Rural Water Supply and Sanitation | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C206a.1 | 1 | 3 | | | | 2 | | | 1 | | | | 1 | 3 | 3 |
| C206a.2 | 2 | 3 | | | | 1 | | | | | 1 | | 1 | 3 | 3 |

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|---------|-----|-----|--|--|--|-----|-----|---|---|---|-----|--|-----|---|---|
| C206a.3 | 2 | 2 | | | | 3 | 2 | 1 | | | | | 2 | 3 | 3 |
| C206a.4 | | | | | | 1 | 2 | | | 1 | 3 | | 2 | 3 | 3 |
| C206a.5 | 1 | | | | | 2 | 3 | | | | 3 | | 2 | 3 | 3 |
| C206a | 1.5 | 2.6 | | | | 1.8 | 2.3 | 1 | 1 | 1 | 2.3 | | 1.6 | 3 | 3 |

| Course Name: Solid Waste Management | |
|---|---|
| Course Code: 15CVT363 | |
| Course outcomes of Solid Waste Management | |
| Sl. No. | Course Outcomes |
| C206b.1 | Explain the components of solid waste management and the laws governing it. |
| C206b.2 | Describe the solid waste collection systems, route optimization techniques and processing of solid waste. |
| C206b.3 | Design, operation, maintenance of landfills and composting units. |
| C206b.4 | Analyse the different sanitary landfilling methods and suggest suitable methods for landfilling. |
| C206b.5 | Discuss the importance and techniques of all major and minor methods of disposal considering plastic and bio - medical waste. |

| Course Name: Solid Waste Management | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT363 | | | | | | | | | | | | | | | |
| POs & PSOs of Solid Waste Management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C206b.1 | | | | | | 3 | 2 | 2 | 1 | | | | 3 | 1 | 3 |
| C206b.2 | | 3 | 2 | | | 1 | 1 | | | | | | 2 | 1 | 3 |

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|---------|---|-----|-----|---|--|-----|-----|-----|---|--|--|---|-----|-----|---|
| C206b.3 | 1 | 2 | 3 | | | 1 | 1 | | | | | 1 | 3 | 3 | 3 |
| C206b.4 | 1 | 2 | 2 | 3 | | 2 | 2 | | | | | 1 | 3 | 2 | 3 |
| C206b.5 | | | | 1 | | 2 | 3 | 1 | | | | | 3 | 1 | 3 |
| C206b | 1 | 2.3 | 2.3 | 2 | | 1.8 | 1.8 | 1.5 | 1 | | | 1 | 2.8 | 1.6 | 3 |

| Course Name: Basic Material Testing Laboratory | |
|--|--|
| Course Code: 15CVL37 | |
| Course outcomes of Basic Material Testing Laboratory | |
| Sl. No. | Course Outcomes |
| C207.1 | Identification and classification of aggregates. |
| C207.2 | Conduct compression, tension, bending and shear tests in UTM to determine strength. |
| C207.3 | Perform torsion, hardness, and impact tests to evaluate material properties. |
| C207.4 | Identify and solve engineering problems of structural elements subjected to flexure. |
| C207.5 | Decide the techniques, skills and modern engineering tools necessary for engineering applications. |

| Course Name: Basic Material Testing Laboratory | | | | | | | | | | | | | | | |
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| Course Code: 15CVL37 | | | | | | | | | | | | | | | |
| POs & PSOs of Basic Material Testing Laboratory | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C207.1 | 3 | 1 | | 2 | | | | | | | | | 3 | 3 | 1 |
| C207.2 | 1 | 2 | | 3 | | | | | | | | | 2 | 3 | 1 |

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| C207.3 | 1 | 2 | | 3 | | | | | | | | | 2 | 3 | 1 |
| C207.4 | 2 | 3 | 1 | 1 | | | | | | | | | 2 | 3 | 1 |
| C207.5 | 2 | | 1 | | 3 | | | | | | | | 3 | 3 | 1 |
| C207 | 1.8 | 2 | 1 | 2.25 | 3 | | | | | | | | 2.4 | 3 | 1 |

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|---|---|
| Course Name: Surveying Practice-I | |
| Course Code: 15CVL38 | |
| Course outcomes of Surveying Practice-I | |
| Sl. No. | Course Outcomes |
| C208.1 | Explain principles involved in different instruments used in surveying. |
| C208.2 | Apply the concepts of basic mathematics and it's in surveying. |
| C208.3 | Develop skill to measure vertical distances using dumpy level. |
| C208.4 | Determine ground profile by levelling. |
| C208.5 | Illustrate the knowledge of using minor instruments. |

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| Course Name: Surveying Practice-I | | | | | | | | | | | | | | | |
| Course Code: 15CVL38 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying Practice-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C208.1 | 3 | 3 | 2 | 2 | 3 | | | | 3 | 3 | | 3 | 3 | 3 | 2 |
| C208.2 | 3 | 3 | 1 | 1 | | | | | 2 | 1 | | 2 | 3 | 3 | 1 |
| C208.3 | 3 | 3 | 3 | 2 | 1 | | | | 3 | 2 | | 1 | 3 | 3 | 2 |
| C208.4 | 3 | 3 | 2 | 1 | | | | | 3 | 3 | | 3 | 3 | 3 | 3 |
| C208.5 | 2 | 1 | | | | | | | 1 | 1 | | 1 | 3 | 1 | 1 |

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| C208 | 2.8 | 2.6 | 2 | 1.5 | 2 | | | | 2.4 | 2 | | 2 | 3 | 2.6 | 1.8 |
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|---|--|
| Course Name: Integrated Rural Development - Part 1 | |
| Course Code: 15CVH39 | |
| Course outcomes Integrated Rural Development - Part 1 | |
| Sl. No. | Course Outcomes |
| C209.1 | Develop the ability to interact and communicate with different sections of society, thus improving their communication skills. |
| C209.2 | Understand the existing problems and needs of a village, thus developing an awareness of the challenges facing in villages |
| C209.3 | Conceptualize, plan, and realize measures to address these problems, thus improving their practical problem - solving and leadership skills. |
| C209.4 | Make an impact to rural section of society, thus building their self - confidence. |
| C209.5 | Generate reports for the social impacts. |

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| Course Name: Integrated Rural Development - Part 1 | | | | | | | | | | | | | | | |
| Course Code: 15CVH39 | | | | | | | | | | | | | | | |
| POs & PSOs of Integrated Rural Development - Part 1 | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C209.1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| C209.2 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |

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| C209.3 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| C209.4 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C209.5 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| C209 | 1.4 | 2.2 | 2.8 | 2.8 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.4 | 2.2 | 3 | 3 | 3 |

| Course Name: Engineering Mathematics-IV (IC) | |
|--|---|
| Course Code: 15CVM41 | |
| Course outcomes of Engineering Mathematics-IV (IC) | |
| Sl. No. | Course Outcomes |
| C210.1 | Determine the differentiation, Integration using numerical methods. |
| C210.2 | Solve differential equations using numerical methods. |
| C210.3 | Find the differentiation and Integrals of complex functions. |
| C210.4 | Find the probability using different distributions and analysis by using samplings. |
| C210.5 | Use the statistical software's. |

| Course Name: Engineering Mathematics-IV (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVM41 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Mathematics-IV (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C210.1 | 1 | 2 | 1 | 3 | 3 | | | 2 | 3 | | | 2 | 1 | 2 | 2 |
| C210.2 | 2 | 2 | 2 | 3 | 3 | | | 2 | 2 | | | 2 | 1 | 2 | 3 |
| C210.3 | 2 | 2 | 1 | 3 | 3 | | | 2 | 1 | | | 2 | 1 | 3 | 2 |

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| C210.4 | 2 | 2 | 1 | 3 | 3 | | | 1 | 2 | | | 2 | 1 | 2 | 1 |
| C210.5 | 1 | 2 | 1 | 2 | 3 | | | 2 | 2 | | | 2 | 1 | 2 | 2 |
| C210 | 1.6 | 2 | 1.2 | 2.8 | 3 | | | 1.8 | 2 | | | 2 | 1 | 2.2 | 2 |

| Course Name: Fluid Mechanics | |
|------------------------------------|--|
| Course Code: 15CVT42 | |
| Course outcomes of Fluid Mechanics | |
| Sl. No. | Course Outcomes |
| C211.1 | Describe the types of fluid and properties of fluids, fluid pressure measurements. |
| C211.2 | Identify the forces acting on a fluid motion and the relation between pressure and velocity in a flow. |
| C211.3 | Analyse the flow mechanism in pipes along with various losses with simple design of pipes. |
| C211.4 | Distinguish between the concept of flow in open channels for uniform flow and non-uniform flow. |
| C211.5 | Identify the pump required for different purposes and classify the turbines. |

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| Course Name: Fluid Mechanics | | | | | | | | | | | | | | | |
| Course Code: 15CVT42 | | | | | | | | | | | | | | | |
| POs & PSOs of Fluid Mechanics | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |

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|--------|---|-----|------|-----|--|--|--|--|--|--|--|--|-----|---|---|
| C211.1 | 3 | 2 | | 1 | | | | | | | | | 2 | 3 | 3 |
| C211.2 | 2 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 3 |
| C211.3 | 1 | 2 | 3 | 3 | | | | | | | | | 1 | 3 | 3 |
| C211.4 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C211.5 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C211 | 2 | 2.6 | 1.75 | 1.6 | | | | | | | | | 1.4 | 3 | 3 |

| Course Name: Structural Analysis-I | |
|--|---|
| Course Code: 15CVT43 | |
| Course outcomes of Structural Analysis-I | |
| Sl. No. | Course Outcomes |
| C212.1 | Identify different structural systems. |
| C212.2 | Analyse the trusses by different methods. |
| C212.3 | Determine forces and moments in arches and cables under different loading conditions. |
| C212.4 | Compute the deflection of structural elements by different methods. |
| C212.5 | Determine support moments for beams under different support conditions. |

| Course Name: Structural Analysis-I | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT43 | | | | | | | | | | | | | | | |
| POs & PSOs of Structural Analysis-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C212.1 | 2 | 3 | | 1 | | | | | | | | | 3 | 3 | 1 |
| C212.2 | 1 | 2 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |

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| C212.3 | 1 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C212.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 1 |
| C212.5 | 2 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C212 | 1.6 | 2.8 | 1.5 | 1.6 | | | | | | | | | 2.2 | 3 | 1 |

| Course Name: Building Planning and Drawing (IC) | |
|---|---|
| Course Code: 15CVI44 | |
| Course outcomes of Building Planning and Drawing (IC) | |
| Sl. No. | Course Outcomes |
| C213.1 | Illustrate the knowledge of bonds in brick masonry. |
| C213.2 | Recognize principles of planning using bylaws for building. |
| C213.3 | Develop plan for public health centre, school building and college canteen. |
| C213.4 | Draw plan, elevation and section for various residential buildings. |
| C213.5 | Illustrate the knowledge of electrical, water supply and sanitary services for residential buildings. |

| Course Name: Building Planning and Drawing (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVI44 | | | | | | | | | | | | | | | |
| POs & PSOs of Building Planning and Drawing (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C213.1 | 3 | 1 | | | | | | | | | | 1 | 1 | 3 | 1 |

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| C213.2 | 3 | 1 | 2 | | | 2 | | 2 | | | | 2 | 3 | 2 | 1 |
| C213.3 | 2 | 2 | 2 | | 3 | 2 | | 2 | 1 | | | 1 | 3 | 2 | 1 |
| C213.4 | 3 | 2 | 2 | 2 | 3 | 1 | | 1 | | | | 2 | 3 | 2 | 1 |
| C213.5 | 2 | 1 | 2 | 1 | 3 | 1 | | | | | | 2 | 1 | 2 | 1 |
| C213 | 2.6 | 1.4 | 2 | 1.5 | 3 | 1.5 | | 1.6 | 1 | | | 1.6 | 2.2 | 2.2 | 1 |

| Course Name: Elements of Construction Industry | |
|--|--|
| Course Code: 15CVT451 | |
| Course outcomes of Elements of Construction Industry | |
| Sl. No. | Course Outcomes |
| C214a.1 | Explain overview of civil engineering professional ethics. |
| C214a.2 | Understand significance of common building materials. |
| C214a.3 | Describe basics structural components and its application. |
| C214a.4 | Understand the basics of planning, execution and importance of the building drawing. |
| C214a.5 | Utilize basics of construction technology and total station surveying. |

| Course Name: Elements of Construction Industry | | | | | | | | | | | | | | | |
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| Course Code: 15CVT451 | | | | | | | | | | | | | | | |
| POs & PSOs of Elements of Construction Industry | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C214a.1 | | | | | | 1 | | 3 | | 2 | | 1 | 1 | 3 | 1 |
| C214a.2 | 3 | 1 | | 2 | | | 1 | | | | | | 3 | 3 | 1 |

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| C214a.3 | 2 | 3 | 1 | | | | | | | | | | 3 | 3 | 1 |
| C214a.4 | 2 | | 3 | 2 | | | | | | | | | 3 | 3 | 1 |
| C214a.5 | 2 | 1 | | | 3 | | | | | | | | 3 | 3 | 1 |
| C214a | 1.8 | 1.67 | 2 | 2 | 3 | 1 | 1 | 3 | | 2 | | 1 | 2.6 | 3 | 1 |

| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 15CVT 455 | |
| Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C214b.1 | Learn the use of different online tools. |
| C214 b.2 | Analyse the problems. |
| C214 b.3 | Communicate effectively on engineering activities. |
| C214 b.4 | Design and develop solutions for complex problems. |
| C214b.5 | Apply the knowledge of engineering fundamentals. |

| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT 455 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C214b.1 | 2 | 1 | | 2 | 3 | | | | | | | | 1 | 3 | 1 |
| C214 b.2 | 1 | 3 | 2 | | 1 | | | | | | | | 1 | 3 | 1 |
| C214 b.3 | 2 | 1 | 1 | | | | | | | 3 | | | 1 | 3 | 1 |

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| C214 b.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | 1 |
| C214b.5 | 3 | 2 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C214b | 1.8 | 1.8 | 1.75 | 1.67 | 1.33 | | | | | 3 | | | 1 | 3 | 1 |

| Course Name: Renewable Energy Resources | |
|---|---|
| Course Code: 15CVT461 | |
| Course outcomes of Renewable Energy Resources | |
| Sl. No. | Course Outcomes |
| C215a.1 | Explain the present energy scenario and the available Renewable Energy Resources. |
| C215a.2 | Describe the basics of solar radiation geometry and various measurement techniques. |
| C215a.3 | Analyse the knowledge gained in tapping the solar energy through solar thermal devices, pv conversion and their performance analysis. |
| C215a.4 | Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal. |
| C215a.5 | Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability. |

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| Course Name: Renewable Energy Resources |
| Course Code: 15CVT461 |
| POs & PSO of Renewable Energy Resources |

| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------|-----|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|------|------|------|
| C215a.1 | 3 | | | | | | 3 | | | | | 2 | 1 | 1 | 2 |
| C215a.2 | 2 | | | | 2 | 2 | 3 | | | | | 1 | 1 | 2 | 1 |
| C215a.3 | 3 | | | | | 2 | 2 | | | | | 1 | 1 | 1 | 2 |
| C215a.4 | 2 | | | | | 2 | 3 | | | | | 2 | 1 | 2 | 1 |
| C215a.5 | 1 | | | | | 3 | 3 | | | | | 2 | 1 | 1 | 2 |
| C215a | 2.2 | | | | 2 | 1.75 | 2.8 | | | | | 1.6 | 1 | 1.4 | 1.6 |

| Course Name: Smart Materials | |
|------------------------------------|--|
| Course Code: 15CVT464 | |
| Course outcomes of Smart Materials | |
| Sl. No. | Course Outcomes |
| C215b.1 | Explain the characteristics of composites and smart materials in the product design process. |
| C215b.2 | Identify various types of sensing and actuation devices. |
| C215b.3 | Analyse the optics and design structures using smart materials. |
| C215b.4 | Demonstrate the working principles of different control systems. |
| C215b.5 | Describe the principles of vibration and modal analysis. |

| Course Name: Renewable Energy Resources | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT461 | | | | | | | | | | | | | | | |
| POs & PSOs of Renewable Energy Resources | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C215b.1 | 3 | | | | | | 3 | | | | | 2 | 1 | 1 | 2 |
| C215b.2 | 2 | | | | 2 | 2 | 3 | | | | | 1 | 1 | 2 | 1 |
| C215b.3 | 3 | | | | | 2 | 2 | | | | | 1 | 1 | 1 | 2 |

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| C215b.4 | 2 | | | | | 2 | 3 | | | | | 2 | 1 | 2 | 1 |
| C215b.5 | 1 | | | | | 3 | 3 | | | | | 2 | 1 | 1 | 2 |
| C215b | 2.2 | | | | 2 | 1.75 | 2.8 | | | | | 1.6 | 1 | 1.4 | 1.6 |

| Course Name: Concrete Laboratory | |
|--|---|
| Course Code: 15CVL47 | |
| Course outcomes of Concrete Laboratory | |
| Sl. No. | Course Outcomes |
| C216.1 | identify the relevant physical properties pertaining to the construction materials |
| C216.2 | Identify the suitability of the materials for the construction works. |
| C216.3 | Recommend the relevant IS testing procedure to be carried out to ascertain the quality of building materials. |
| C216.4 | Design a concrete mix as per IS 10262:2009 |
| C216.5 | Recognize the construction techniques to be followed in Brick and Stone Masonry |

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| Course Name: Concrete Laboratory | | | | | | | | | | | | | | | |
| Course Code: 15CVL47 | | | | | | | | | | | | | | | |
| POs & PSOs of Concrete Laboratory | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |

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| C216.1 | 2 | 2 | | | 1 | 1 | 2 | | 2 | 2 | | 3 | 1 | 2 | 1 |
| C216.2 | 3 | 2 | | 2 | 1 | 1 | 2 | | 2 | 2 | | 3 | 3 | 3 | 1 |
| C216.3 | 3 | 2 | 2 | 1 | | 2 | | | 2 | 2 | | 2 | 3 | 2 | 1 |
| C216.4 | 3 | 2 | 3 | | | 1 | 1 | | 1 | 1 | | 2 | 3 | 3 | 1 |
| C216.5 | 3 | 2 | | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 3 | 3 | 1 |
| C216 | 2.8 | 2 | 2.5 | 1.67 | 1.33 | 1.2 | 1.67 | | 1.8 | 1.8 | 2 | 2.4 | 2.6 | 2.6 | 1 |

| Course Name: Surveying Practice-II | |
|--|--|
| Course Code: 15CVL48 | |
| Course outcomes of Surveying Practice-II | |
| Sl. No. | Course Outcomes |
| C217.1 | Recognise the importance of theodolite in the field of surveying. |
| C217.2 | Construct the simple curves using different linear methods. |
| C217.3 | Illustrate the concepts and principles in setting out simple and compounds curves. |
| C217.4 | Illustrate the use of total station in the different fields of surveying. |
| C217.5 | Compute the coordinates and to measure distances using GPS. |

| Course Name: Surveying Practice-II | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVL48 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying Practice-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C217.1 | 3 | 3 | 2 | | 1 | | | | 3 | 2 | | 2 | 3 | 3 | 1 |
| C217.2 | 3 | 3 | 3 | 1 | 1 | | | | 2 | | | 2 | 3 | 3 | 1 |

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| C217.3 | 3 | 3 | 3 | 1 | 1 | | | | 2 | | | 2 | 3 | 3 | 1 |
| C217.4 | 2 | 2 | 2 | | 3 | | | | 3 | 2 | | 3 | 3 | 3 | 2 |
| C217.5 | 3 | 1 | | | 3 | | | | 2 | 1 | | 3 | 3 | 2 | 1 |
| C217 | 2.8 | 2.4 | 2.5 | 1 | 1.8 | | | | 2.4 | 1.67 | | 2.4 | 3 | 2.8 | 1.2 |

| Course Name: Integrated Rural Development - Part 2 | |
|--|---|
| Course Code: 15CVH49 | |
| Course outcomes of Integrated Rural Development - Part 2 | |
| Sl. No. | Course Outcomes |
| C218.1 | Further develop their social and communication skills by interacting with residents of the village and within their team. |
| C218.2 | Conceptualize long term solution to challenges in villages, thus developing a sense of entrepreneurship. |
| C218.3 | Make an impact to rural sections of society, thus building their self-confidence. |
| C218.4 | Deep understanding the socio economic problems. |
| C218.5 | Improve the quality of Education in villages. |

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| Course Name: Integrated Rural Development - Part 2 | | | | | | | | | | | | | | | |
| Course Code: 15CVH49 | | | | | | | | | | | | | | | |
| POs & PSOs of Integrated Rural Development - Part 2 | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |

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|--------|---|-----|-----|-----|---|-----|-----|-----|-----|-----|-----|-----|---|---|---|
| C218.1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| C218.2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C218.3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| C218.4 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C218.5 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| C218 | 2 | 2.2 | 2.8 | 2.8 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.4 | 2.2 | 3 | 3 | 3 |

| Course Name: Transportation Engineering (IC) | |
|--|--|
| Course Code: 15CVI51 | |
| Course outcomes of Transportation Engineering (IC) | |
| Sl. No. | Course Outcomes |
| C301.1 | Detailed study of road transport that includes characteristics features, various committee. Recommendations, different road patterns and road development programs in India. |
| C301.2 | Factors influencing road alignment, different types of road surveys and factors influencing geometric design. |
| C301.3 | Horizontal and vertical alignment, Pavement materials and its properties. |
| C301.4 | Pavement design as per IRC and details of pavement. |
| C301.5 | Importance of Highway Drainage system and Highway Economics. |

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| Course Name: Transportation Engineering (IC) | | | | | | | | | | | | | | | |
| Course Code: 15CVI51 | | | | | | | | | | | | | | | |
| POs & PSOs of Transportation Engineering (IC) | | | | | | | | | | | | | | | |
| PO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |

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|--------|-----|-----|---|-----|--|-----|--|--|--|-----|--|--|-----|---|---|
| CO'S | | | | | | | | | | | | | | | |
| C301.1 | 3 | 2 | | 3 | | 2 | | | | 1 | | | 2 | 2 | 1 |
| C301.2 | 3 | 3 | 2 | 2 | | 1 | | | | | | | 2 | 1 | 1 |
| C301.3 | 3 | 3 | 2 | 2 | | 1 | | | | | | | 2 | 2 | 1 |
| C301.4 | 3 | 2 | 3 | 2 | | 1 | | | | | | | 1 | 3 | 1 |
| C301.5 | 2 | 3 | 1 | 2 | | 1 | | | | 2 | | | 1 | 2 | 1 |
| C301 | 2.8 | 2.6 | 2 | 2.2 | | 1.2 | | | | 1.5 | | | 1.6 | 2 | 1 |

| Course Name: Structural Analysis-II | |
|---|---|
| Course Code: 15CVT52 | |
| Course outcomes of Structural Analysis-II | |
| Sl. No. | Course Outcomes |
| C302.1 | Analyse beams and frames by slope deflection method |
| C302.2 | To solve the problems connected with analysis of various structural components |
| C302.3 | To analyse the given frames by suitable method. |
| C302.4 | To evaluate the continuous beams by suitable methods. |
| C302.5 | To understand the basic concepts of principles of dynamics, Rolling load analysis and influence line diagram for S.S beams. |

| Course Name: Structural Analysis-II | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT52 | | | | | | | | | | | | | | | |
| POs & PSOs of Structural Analysis-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C302.1 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 2 |

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| C302.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C302.3 | 2 | 3 | 2 | 1 | | | | | | | | | 1 | 3 | 1 |
| C302.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 2 |
| C302.5 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C302 | 1 | 2 | | 1.3 | | | | | | | | | | 1.8 | 2 |

| Course Name: Design of RCC Structural Elements (IC) | |
|---|--|
| Course Code: 15CVI53 | |
| Course outcomes of Design of RCC Structural Elements (IC) | |
| Sl. No. | Course Outcomes |
| C303.1 | Recognize the design philosophies of reinforced concrete structures. |
| C303.2 | Apply the principles, procedures and current code requirements to the analysis and design of reinforced concrete beams using limit state method. |
| C303.3 | Understand and Design Reinforced Concrete slabs. |
| C303.4 | Analyse and Design the Reinforced Concrete Columns and stair cases. |
| C303.5 | Design structures for serviceability and footings. |

| Course Name: Design of RCC Structural Elements (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVI53 | | | | | | | | | | | | | | | |
| POs & PSOs of Design of RCC Structural Elements (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C303.1 | 1 | 3 | | 2 | | | | | | | | | 1 | 3 | |

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|--------|-----|-----|---|---|--|--|--|---|--|--|--|--|---|---|--|
| C303.2 | 2 | 3 | | 1 | | | | 1 | | | | | 1 | 3 | |
| C303.3 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303.4 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303.5 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303 | 1.8 | 2.4 | 3 | 1 | | | | 1 | | | | | 1 | 3 | |

| Course Name: Construction Industry Practice-I | |
|---|--|
| Course Code: 15CVT541 | |
| Course outcomes of Construction Industry Practice-I | |
| Sl. No. | Course Outcomes |
| C304a.1 | apply the knowledge of civil engineering |
| C304a.2 | Apply different type of Loads of Structures and their impact on structural elements. |
| C304a.3 | Understand Concrete applications in civil engineering. |
| C304a.4 | Understand Construction Methodologies. |
| C304a.5 | Analyse Masonry structures Specification/ Tendering and Contract Documentations. |

| Course Name: Construction Industry Practice-I | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT541 | | | | | | | | | | | | | | | |
| POs & PSOs of Construction Industry Practice-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C304a.1 | 3 | 2 | 1 | | | | | | | | | | | 3 | |
| C304a.2 | 3 | 3 | | 1 | | | | | | | | | | 3 | |

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|---------|---|-----|-----|---|--|--|--|--|--|--|--|--|--|-----|--|
| C304a.3 | 3 | 2 | 1 | | | | | | | | | | | 2 | |
| C304a.4 | 3 | 3 | 2 | 1 | | | | | | | | | | 3 | |
| C304a.5 | 3 | | | | | | | | | | | | | 3 | |
| C304a | 3 | 2.5 | 1.3 | 1 | | | | | | | | | | 2.8 | |

| Course Name: Traffic Engineering | |
|--|---|
| Course Code: 15CVT543 | |
| Course outcomes of Traffic Engineering | |
| Sl. No. | Course Outcomes |
| C304b.1 | The objective and scope of traffic engineering and traffic characteristics. |
| C304b.2 | Understand interpretation of the traffic study and traffic flow theory. |
| C304b.3 | Conduct traffic studies and analyse traffic data |
| C304b.4 | Design traffic signal systems |
| C304b.5 | Understand traffic regulation and control and ITS. |

| Course Name: Traffic Engineering | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT543 | | | | | | | | | | | | | | | |
| POs & PSOs of Traffic Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C304b.1 | 3 | | 3 | | | | | | | | | 2 | 2 | 2 | 1 |

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|---------|---|---|-----|---|---|---|--|--|--|--|------|---|-----|---|
| C304b.2 | 2 | 2 | | 2 | | | | | | | 2 | 3 | 2 | 1 |
| C304b.3 | | 2 | 3 | 3 | | | | | | | 3 | 2 | 2 | 1 |
| C304b.4 | | 2 | 2 | 1 | | | | | | | | 2 | 3 | 1 |
| C304b.5 | 1 | | | | 2 | 2 | | | | | 2 | 1 | 2 | 1 |
| C304b | 2 | 2 | 2.6 | 2 | 2 | 2 | | | | | 2.25 | 2 | 2.2 | 1 |

| Course Name: Construction Management and Engineering Economics | |
|--|---|
| Course Code: 15CVI552 | |
| Course outcomes of Construction Management and Engineering Economics | |
| Sl. No. | Course Outcomes |
| C305.1 | Understand the nature of construction industry and the importance of management |
| C305.2 | Formulate project management principles to solve problems on construction network and time estimates. |
| C305.3 | Understand the importance of Resources management in construction |
| C305.4 | Apply the concepts of economics and finance in constructions |
| C305.5 | Understand the concepts of financial management in construction and construction accounting. |

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| Course Name: Construction Management and Engineering Economics |
| Course Code: 15CVI552 |
| POs & PSOs of Construction Management and Engineering Economics |

| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C305.1 | 2 | | | | | | | | 2 | | 3 | | | 3 | |
| C305.2 | 3 | 3 | | 1 | 2 | | | | | | 3 | | | 3 | |
| C305.3 | 3 | 3 | | 3 | | | | | 1 | 1 | 3 | | | 3 | |
| C305.4 | | | | | | 1 | | | | | 3 | | | 3 | |
| C305.5 | 1 | | | | | | | | | | 3 | | | 3 | |
| C305 | 2.25 | 3 | | 2 | 2 | 1 | | | 1.5 | 1 | 3 | | | 3 | |

| Course Name: Building Services | |
|--------------------------------------|---|
| Course Code: 15CVT562 | |
| Course outcomes of Building Services | |
| Sl. No. | Course Outcomes |
| C306a.1 | Understand the analysis of water supply, water purifying techniques, different types of storages of water in multi-storeyed building. |
| C306a.2 | Understand the principles of drainage, different types of traps, ventilation of house drainage and types of fixtures and materials. |
| C306a.3 | Apply the knowledge of the basic electrical system. |
| C306a.4 | Identify the illumination and lighting design and electrical layout for different type of structures. |
| C306a.5 | Formulate the concept of HVAC. |

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| Course Name: Building Services | |
| Course Code: 15CVT562 | |
| POs & PSOs of Building Services | |

| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C306a.1 | 1 | 1 | | | | 2 | 3 | | | | | 1 | 3 | 3 | 3 |
| C306a.2 | 1 | 1 | | | | 3 | 2 | | | | | | 1 | 3 | 3 |
| C306a.3 | 3 | 1 | 1 | | | | | | | | | | 1 | 3 | 1 |
| C306a.4 | 1 | 3 | | | 2 | | | | | | | | 3 | 3 | 1 |
| C306a.5 | 2 | 3 | | 1 | 1 | | | | | | | | 1 | 3 | 1 |
| C306a | 1.6 | 1.8 | 1 | 1 | 1.5 | 2.5 | 2.5 | | | | | 1 | 1.8 | 3 | 1.8 |

| Course Name: Hydrology and Irrigation Engineering | |
|---|---|
| Course Code: 15CVT563 | |
| Course outcomes of Hydrology and Irrigation Engineering | |
| Sl. No. | Course Outcomes |
| C306b.1 | Apply the knowledge of hydrology to estimate the availability of rainfall with respect to time and space. |
| C306b.2 | Analyse the various types of water losses to forecast runoff. |
| C306b.3 | Plan and design flood estimation aspects. |
| C306b.4 | Understand the fundamentals principles of irrigation engineering. |
| C306b.5 | Investigate crop water requirements and design of canal systems. |

| Course Name: Hydrology and Irrigation Engineering | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT563 | | | | | | | | | | | | | | | |
| POs & PSOs of Hydrology and Irrigation Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C306b.1 | 3 | 2 | | 1 | | | 2 | | | | | | 2 | 3 | 3 |

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|---------|-----|---|---|---|--|--|-----|--|--|--|--|---|-----|---|---|
| C306b.2 | 1 | 2 | | 3 | | | 2 | | | | | | 1 | 3 | 3 |
| C306b.3 | 1 | 2 | 3 | | | | 1 | | | | | | 3 | 3 | 3 |
| C306b.4 | 3 | 2 | | | | | 1 | | | | | | 1 | 3 | 3 |
| C306b.5 | 1 | 2 | 3 | | | | 1 | | | | | 1 | 1 | 3 | 3 |
| C306b | 1.8 | 2 | 3 | 2 | | | 1.4 | | | | | 1 | 1.6 | 3 | 3 |

| Course Name: Project Based Learning | |
|---|---|
| Course Code: 15CVT564 | |
| Course outcomes of Project Based Learning | |
| Sl. No. | Course Outcomes |
| C306c.1 | Engage more in the learning process |
| C306c.2 | Think outside the box by thinking differently about the problem |
| C306c.3 | Make deep connections between ideas |
| C306c.4 | Make them problem-solvers |
| C306c.5 | Learn project management |

| Course Name: Project Based Learning | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code:15CVT564 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Based Learning | | | | | | | | | | | | | | | |
| POS CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C306c.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |

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| C306c.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C306c.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C306c.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C306c.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C306c | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| Course Name: Fluid Mechanics Lab | |
|--|---|
| Course Code: 15CVL57 | |
| Course outcomes of Fluid Mechanics Lab | |
| Sl. No. | Course Outcomes |
| C307.1 | Apply the knowledge gained in the field of fluid mechanics and hydraulics. |
| C307.2 | Demonstrate and analyse static and dynamic fluid conditions. |
| C307.3 | Gain knowledge about measurement of flows and will be able to calibrate them. |
| C307.4 | Estimate the major loss of head in pipe flow. |
| C307.5 | Analyse the impact of jets on various types of vanes and evaluate performance characteristics of turbines and pump. |

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| Course Name: Fluid Mechanics Lab |
| Course Code: 15CVL57 |

| POs & PSOs of Fluid Mechanics Lab | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C307.1 | 3 | 2 | | | | | 1 | | | | | | 1 | 3 | 3 |
| C307.2 | 1 | 2 | | 3 | | | | | | | | | 1 | 3 | 2 |
| C307.3 | 3 | 2 | | 1 | 1 | | | | | | | | 3 | 3 | 2 |
| C307.4 | 2 | 3 | | 1 | | | | | 1 | | | | 1 | 3 | 3 |
| C307.5 | 2 | 2 | | 3 | | | | | 1 | | | | 1 | 3 | 3 |
| C307 | 2.2 | 2.2 | | 2 | 1 | | 1 | | 1 | | | | 1.4 | 3 | 2.6 |

| Course Name: Analysis and Design Lab-I | |
|--|--|
| Course Code: 15CVL58 | |
| Course outcomes of Analysis and Design Lab-I | |
| Sl. No. | Course Outcomes |
| C308.1 | To impart FEM software for the analysis of structural elements |
| C308.2 | Draw SFD and BMD for various kind of beam using Excel. |
| C308.3 | Prepare design spared sheet. |
| C308.4 | Design RCC components using excel |
| C308.5 | Plot graph for various problems using excel |

| Course Name: Analysis and Design Lab-I | | | | | | | | | | | | | | | |
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| Course Code: 15CVL58 | | | | | | | | | | | | | | | |
| POs & PSOs of Analysis and Design Lab-I | | | | | | | | | | | | | | | |
| PO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |

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|--------|-----|---|-----|------|---|--|--|--|-----|---|-----|---|---|-----|--|
| CO'S | | | | | | | | | | | | | | | |
| C308.1 | 1 | 3 | 3 | 3 | 3 | | | | 2 | | 1 | 2 | | 3 | |
| C308.2 | 1 | 3 | 3 | 2 | 3 | | | | 2 | | | 2 | 1 | 2 | |
| C308.3 | 1 | 3 | 3 | | | | | | 1 | 1 | 2 | 2 | | 3 | |
| C308.4 | 2 | 3 | 3 | 2 | | | | | 1 | | | 2 | | 3 | |
| C308.5 | 2 | 3 | 1 | 2 | | | | | 2 | 1 | 1 | 2 | 1 | 2 | |
| C308 | 1.4 | 3 | 2.6 | 2.25 | 3 | | | | 1.6 | 2 | 1.3 | 2 | 1 | 2.6 | |

| Course Name: General Aptitude | |
|-------------------------------------|---|
| Course Code: 15CVH59 | |
| Course outcomes of General Aptitude | |
| Sl. No. | Course Outcomes |
| C309.1 | Solve and analyse different types of numerical / arithmetical problems. |
| C309.2 | Solve and analyse different data interpretation problems. |
| C309.3 | Acquire satisfactory competency in the use of numerical ability. |
| C309.4 | Understand the basic concepts of logical reasoning. |
| C309.5 | Compete in various competitive exams. |

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| Course Name: General Aptitude | |
| Course Code: 15CVH59 | |
| POs & PSOs of General Aptitude | |

| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C309.1 | 3 | 2 | 1 | | | | | | | | | 1 | | 1 | |
| C309.2 | 3 | 2 | 1 | | | | | | | | | 1 | | 1 | |
| C309.3 | 3 | 2 | 1 | 1 | | | | | | | | 1 | | 1 | |
| C309.4 | 3 | 2 | 1 | 1 | | | | | | | | 1 | | 1 | |
| C309.5 | 3 | 2 | 1 | 1 | | | | | 1 | 1 | | 2 | | 1 | |
| C309 | 3 | 2 | 1 | 1 | | | | | 1 | 1 | | 1.2 | | 1 | |

| Course Name: Design of Steel Structures (IC) | |
|--|---|
| Course Code: 15CVI61 | |
| Course outcomes of Design of Steel Structures (IC) | |
| Sl. No. | Course Outcomes |
| C310.1 | Understand the concept of Limit State Design of steel structures. |
| C310.2 | Analyse and design steel structural beams subjected to plastic behaviour. |
| C310.3 | Capable of design various steel components using bolted and welded connections and also to develop a Cad drawing for the fabrication of different components of structures. |
| C310.4 | Apply Indian Standard code provisions for the design of tension and compression members. |
| C310.5 | Design flexural members and bases |

| Course Name: Design of Steel Structures (IC) |
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| Course Code: 15CVI61 | | | | | | | | | | | | | | | |
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| POs & PSOs of Design of Steel Structures (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C310.1 | 2 | 1 | 3 | | | | | | | | | | 1 | 3 | |
| C310.2 | 1 | 1 | 3 | 3 | | | | | | | | | | 3 | |
| C310.3 | 1 | 2 | 3 | | | | | | | | | | | 3 | |
| C310.4 | 1 | 2 | 3 | | | | | 2 | | | | | | 3 | |
| C310.5 | 1 | 2 | 3 | | | | | | | | | | | 3 | |
| C310 | 1.2 | 1 | 2.75 | 3 | 2 | | | 2 | | | | 2 | 1 | 2.75 | |

| Course Name: Geotechnical Engineering-I | |
|---|---|
| Course Code: 15CVT62 | |
| Course outcomes of Geotechnical Engineering-I | |
| Sl. No. | Course Outcomes |
| C311.1 | Solve three phase system problems. |
| C311.2 | Carry out index properties of soil and classification. |
| C311.3 | Solve any practical problems related to permeability and compaction. |
| C311.4 | Solve practical problems related to consolidation settlement and time rate of settlement. |
| C311.5 | Estimate the shear strength parameters in cohesive and cohesion less soils. |

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| Course Name: Geotechnical Engineering-I |
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| Course Code: 15CVT62 | | | | | | | | | | | | | | | |
|--|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| POs & PSOs of Geotechnical Engineering-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C311.1 | 3 | 2 | 1 | | | | | | | | | | 1 | 3 | |
| C311.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | |
| C311.3 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C311.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C311.5 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | |
| C311 | 2.4 | 2.6 | 1 | 1.25 | | | | | | | | | 1 | 3 | 3 |

| Course Name: Environmental Engineering (IC) | |
|---|--|
| Course Code: 15CVI63 | |
| Course outcomes of Environmental Engineering (IC) | |
| Sl. No. | Course Outcomes |
| C312.1 | Recognize the importance of water to protect the water resources which is facing a continuous degradation in water quality. |
| C312.2 | Recognize that water supply and sanitation is an important professional and ethical responsibility of civil engineer. |
| C312.3 | Demonstrate an ability to recognize the type of unit operations and processes involved in water and wastewater treatment plants. |
| C312.4 | Demonstrate an ability to design individual unit operation in treatment of water and wastewater. |
| C312.5 | Demonstrate ability in monitoring and analysis of water and waste water quality parameters |

| Course Name: Environmental Engineering (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVI63 | | | | | | | | | | | | | | | |
| POs & PSOs of Environmental Engineering (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C312.1 | 1 | | | | | 2 | 3 | | 1 | | | | 1 | 3 | 3 |
| C312.2 | 1 | | | | | 2 | 3 | 2 | | | | | 3 | | 2 |
| C312.3 | 1 | | 2 | | | 2 | 3 | | | | | | 3 | | 3 |
| C312.4 | 1 | | 3 | | | 2 | 2 | | | | | | 3 | 3 | 3 |
| C312.5 | 1 | | | | 2 | 1 | 3 | 2 | | | | | 1 | 2 | 3 |
| C312 | 1 | | 2.5 | | 2 | 1.8 | 2.8 | 2 | 1 | | | | 2.2 | 2.67 | 2.8 |

| Course Name: Construction Industry Practice-II | |
|--|--|
| Course Code: 15CVT641 | |
| Course outcomes of Construction Industry Practice-II | |
| Sl. No. | Course Outcomes |
| C313a.1 | Identify the phases of Soil Investigation |
| C313a.2 | Analyse and design of RC Buildings |
| C313a.3 | Design the Steel Buildings |
| C313a.4 | Gain the Knowledge of Detailing of RC Buildings |
| C313a.5 | Gain the Knowledge of Detailing of Steel Buildings |

| Course Name: Construction Industry Practice-II | |
|---|--|
| Course Code: 15CVT641 | |
| POs & PSOs of Construction Industry Practice-II | |

| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C313a.1 | 2 | 2 | | 3 | 1 | | | | | | | | 3 | 3 | 1 |
| C313a.2 | 1 | 2 | 3 | 2 | | | | | | | | | | 3 | |
| C313a.3 | 1 | 2 | 3 | 1 | | | | | | | | | | 3 | |
| C313a.4 | 2 | 3 | | 1 | | | | | | | | | | 3 | |
| C313a.5 | 2 | 3 | | 1 | | | | | | | | | | 3 | |
| C313a | 1.6 | 2.4 | 3 | 1.6 | 1 | | | | | | | | 3 | 3 | 1 |

| Course Name: Advanced Transportation Engineering | |
|--|--|
| Course Code: 15CVT642 | |
| Course outcomes of Advanced Transportation Engineering | |
| Sl. No. | Course Outcomes |
| C313b.1 | Introduction to Railway Engineering and its importance in transportation sector |
| C313b.2 | Importance of Traction and Tractive resistance and Geometric Design in Railways |
| C313b.3 | Importance of Airport Engineering and Basic Runway Design in Airport Engineering |
| C313b.4 | Definition of Tunnel, Different types of tunnels and methods of tunnelling |
| C313b.5 | To learn the importance of Harbour and dock construction. |

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| Course Name: Advanced Transportation Engineering |
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| Course Code: 15CVT642 | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| POs & PSOs of Advanced Transportation Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C313b.1 | 3 | 2 | 1 | | | 1 | | | | | | | | 2 | 1 |
| C313b.2 | 2 | 3 | 2 | 1 | | | | | | | | | 1 | 3 | 1 |
| C313b.3 | 3 | 1 | | 2 | | | | | | | | | 2 | 3 | 1 |
| C313b.4 | 3 | 2 | 1 | 2 | | | | | | | | | 1 | 3 | 1 |
| C313b.5 | 2 | 3 | | 1 | | | | | | | | | | 3 | 1 |
| C313b | 1.8 | 2 | 1.5 | 2 | 1 | 2 | | | | | | | 2 | 1.8 | 1 |

| Course Name: Pavement Materials and Construction | |
|--|--|
| Course Code: 15CVT653 | |
| Course outcomes of Pavement Materials and Construction | |
| Sl. No. | Course Outcomes |
| C314a.1 | Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes |
| C314a.2 | Analyse flexible pavements and rigid pavements. |
| C314a.3 | Understand the need of various equipment required for construction of highways. |
| C314a.4 | Construction of flexible pavement and rigid pavement. |
| C314a.5 | Prepare quality assurance and quality control plans in an attempt to construct better performing pavements |

| Course Name: Pavement Materials and Construction | |
|--|--|
| Course Code: 15CVT653 | |

| POs & PSOs of Pavement Materials and Construction | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C314a.1 | 3 | | | | | 1 | 2 | | | | | 1 | 1 | 2 | 1 |
| C314a.2 | 2 | 3 | 2 | | | | | | | | | 2 | 2 | 3 | 1 |
| C314a.3 | | 1 | | 2 | 3 | | | | | | | | 2 | 3 | 1 |
| C314a.4 | 1 | | 3 | 3 | | | | | | | | | 2 | 3 | 1 |
| C314a.5 | 1 | | | 2 | | 2 | 3 | | | | | 2 | 1 | 2 | 1 |
| C314a | 1.4 | 2 | 2.5 | 2.3 | 3 | 1.5 | 2.5 | | | | | 1.6 | 1.6 | 2.6 | 1 |

| Course Name: Project Based Learning | |
|---|---|
| Course Code: 15CVT654 | |
| Course outcomes of Project Based Learning | |
| Sl. No. | Course Outcomes |
| C314b.1 | Engage more in the learning process |
| C314b.2 | Think outside the box by thinking differently about the problem |
| C314b.3 | Make deep connections between ideas |
| C314b.4 | Make them problem-solvers |
| C314b.5 | Learn project management |

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| Course Name: Project Based Learning | |
| Course Code: 15CVT654 | |
| POs & PSOs of Project Based Learning | |

| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C314b.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C314b.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C314b.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C314b.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C314b.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C314b | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| Course Name: Yoga and Meditation | |
|--|---|
| Course Code: 15HOE662 | |
| Course outcomes of Yoga and Meditation | |
| Sl. No. | Course Outcomes |
| C316a.1 | Know the basic principles of yoga |
| C316a.2 | Know and practice the basic asanas and their benefits. |
| C316a.3 | Use pranayama and meditation for improving health and mental peace. |
| C316a.4 | Know the difference between meditation and concentration. |
| C316a.5 | Apply the principles of Ayurveda and implement them for ones benefit. |

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| Course Name: Yoga and Meditation |
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| Course Code: 15HOE662 | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| POs & PSOs of Yoga and Meditation | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315a.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315a.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315a.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315a.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315a.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315a | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Martial Arts | |
|---------------------------------|--|
| Course Code: 15HOE663 | |
| Course outcomes of Martial Arts | |
| Sl. No. | Course Outcomes |
| C315b.1 | Demonstrate a grasp of the various Martial Arts' notion of "self-cultivation" and be able to relate it to their own personal growth |
| C315b.2 | Demonstrate the practical leadership skills and intercultural literacy needed to assume entry level leadership positions in business, government, and in civil society |
| C315b.3 | Develop appreciation of diversity in the world and in intellectual areas such as but not limited to the humanities and the social sciences. |
| C315b.4 | Show the desire and ability to pursue learning throughout life |
| C315b.5 | Demonstrate strong written and oral communication skills |

| Course Name: Martial Arts | | | | | | | | | | | | | | | |
|----------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15HOE663 | | | | | | | | | | | | | | | |
| POs & PSOs of Martial Arts | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315b.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315b.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315b.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315b.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315b.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315b | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Music (Carnatic Vocal / Instrumental) | |
|--|---|
| Course Code: 15HOE664 | |
| Course outcomes of Music (Carnatic Vocal / Instrumental) | |
| Sl. No. | Course Outcomes |
| C315c.1 | Gain knowledge about the theoretical background of carnatic music |
| C315c.2 | Acquire practical knowledge on basics of Carnatic music. |
| C315c.3 | Practical demonstration of different Talas. |
| C315c.4 | Distinguish among various Raagas based on swarasthanas. |
| C315c.5 | To synchronize the Raaga and Taala. |

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| Course Name: Music (Carnatic Vocal / Instrumental) | |
| Course Code: 15HOE664 | |

| POs & PSOs of Music (Carnatic Vocal / Instrumental) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315c.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315c.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315c.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315c.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315c.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315c | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Dance | |
|--------------------------|--|
| Course Code: 15HOE665 | |
| Course outcomes of Dance | |
| Sl. No. | Course Outcomes |
| C315d.1 | Get an insight into various types of Indian dances. |
| C315d.2 | Gain knowledge of different instruments used to perform dance. |
| C315d.3 | Perform exercises on prarthane, Namaskara according to Bharatanatya style. |
| C315d.4 | Perform basic steps in Abhinaya. |
| C315d.5 | Recognise and perform different Adavus. |

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| Course Name: Dance |
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| Course Code: 15HOE665 | | | | | | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| POs & PSOs of Dance | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315d.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315d.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315d.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315d.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315d.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315d | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Sports | |
|---------------------------|--|
| Course Code: 15HOE666 | |
| Course outcomes of Sports | |
| Sl. No. | Course Outcomes |
| C315e.1 | Demonstrate adequate knowledge and competencies needed to be successful sports management professionals. |
| C315e.2 | Apply knowledge and skills learned throughout the curriculum in real world. |
| C315e.3 | Apply critical thinking and reasoning skills as sports professionals. |
| C315e.4 | Communicate, orally and in writing, as a sports professional within various sports. |
| C315e.5 | Analyse situations and apply the principles of appropriate leadership skills and behaviours related to sports and sport leadership responsibilities. |

| Course Name: Sports | | | | | | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15HOE666 | | | | | | | | | | | | | | | |
| POs & PSOs of Sports | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315e.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315e.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315e.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315e.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315e.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315e | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 15HOE667 | |
| Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C315f.1 | Learn the use of different online tools. |
| C315f.2 | Analyse the problems. |
| C315f.3 | Communicate effectively on engineering activities. |
| C315f.4 | Design and develop solutions for complex problems. |
| C315f.5 | Apply the knowledge of engineering fundamentals. |

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| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX |
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| Course Code: 15HOE667 | | | | | | | | | | | | | | | |
|--|-----|-----|------|------|------|-----|-----|-----|-----|------|------|------|------|------|------|
| POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315f.1 | 2 | 1 | | 2 | 3 | | | | | | | | 1 | 3 | 1 |
| C315f.2 | 1 | 3 | 2 | | 1 | | | | | | | | 1 | 3 | 1 |
| C315f.3 | 2 | 1 | 1 | | | | | | | 3 | | | 1 | 3 | 1 |
| C315f.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | 1 |
| C315f.5 | 3 | 2 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C315f | 1.8 | 1.8 | 1.75 | 1.67 | 1.33 | | | | | 3 | | | 1 | 3 | 1 |

| Course Name: Detailing of Structural Elements Lab | |
|---|--|
| Course Code: 15CVL67 | |
| Course outcomes of Detailing of Structural Elements Lab | |
| Sl. No. | Course Outcomes |
| C316.1 | Execute computer aided drawing for detailing different structural components |
| C316.2 | Develop working drawing for structural fabrication based on design. |
| C316.3 | Set up a drawing of different components which are useful for the industries |
| C316.4 | Interpret and analyse views of a drawing |
| C316.5 | Design of structural components as per IS standards |

| Course Name: Detailing of Structural Elements Lab | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVL67 | | | | | | | | | | | | | | | |
| POs & PSOs of Detailing of Structural Elements Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C316.1 | 1 | | 3 | 2 | 2 | | | | | | | | 2 | 3 | |
| C316.2 | | 2 | 3 | 1 | 2 | | | | | | | | 2 | 3 | |
| C316.3 | | 2 | 3 | 1 | 1 | | | | | | | | 1 | 3 | |
| C316.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | |
| C316.5 | | 2 | 3 | 1 | 1 | | | 2 | | | | | 1 | 3 | |
| C316 | 1 | 2 | 3 | 1.4 | 1.4 | | | 2 | | | | | 1.4 | 3 | |

| Course Name: Extensive Survey Camp | |
|--|---|
| Course Code: 15CVL68 | |
| Course outcomes of Extensive Survey Camp | |
| Sl. No. | Course Outcomes |
| C317.1 | Understand of the principles and operation of the Global Positioning System for locating salient features by Total Station. |
| C317.2 | Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork for civil engineering projects. |
| C317.3 | Apply the need for licensed surveyors to establish positioning information for property and structures. |
| C317.4 | Prepare layout plans as per the specifications of the local bodies. |
| C317.5 | Develop communication skills and team work in any project. |

| Course Name: Extensive Survey Camp | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVL68 | | | | | | | | | | | | | | | |
| POs & PSOs of Extensive Survey Camp | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C317.1 | 3 | 2 | 2 | 1 | 2 | | | | 2 | 2 | | 1 | 3 | 3 | 2 |
| C317.2 | 2 | 2 | 1 | | 1 | | | | 2 | 1 | | 1 | 2 | 3 | 1 |
| C317.3 | 1 | | 2 | | | 2 | | 1 | | | | 1 | 1 | 3 | 1 |
| C317.4 | 2 | 1 | 2 | | 2 | 1 | | 1 | | | | 1 | 3 | 3 | 1 |
| C317.5 | 2 | 1 | | | | | | | 2 | 3 | | | 2 | 2 | 2 |
| C317 | 2 | 1.2 | 1.4 | 1 | 1.66 | 1.5 | | 1 | 2 | 2 | | 1 | 2.2 | 2.8 | 1.4 |

| Course Name: Technical Aptitude and GD | |
|--|--|
| Course Code: 15CVH69 | |
| Course outcomes of Technical Aptitude and GD | |
| Sl. No. | Course Outcomes |
| C318.1 | Solve and analyse different types of technical problems. |
| C318.2 | Solve and analyse different data interpretation problems. |
| C318.3 | Acquire satisfactory competency in solving technical problems. |
| C318.4 | Use the communication skills in further activities. |
| C318.5 | Apply the knowledge of group discussion in further placement activities. |

Course Name: Technical Aptitude and GD

| Course Code: 15CVH69 | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| POs & PSOs of Technical Aptitude and GD | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C318.1 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.2 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.3 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.4 | | | | | | | | | 2 | 3 | | 1 | | | |
| C318.5 | | | | | | | | | 2 | 3 | | 1 | | | |
| C318 | 2 | 3 | | | | | | | 2 | 3 | | 1 | 2 | 2 | 2 |

| Course Name: Geotechnical Engineering-II (IC) | |
|---|---|
| Course Code: 15CVI71 | |
| Course outcomes of Geotechnical Engineering-II (IC) | |
| Sl. No. | Course Outcomes |
| C401.1 | Analyse any field situation with the knowledge gained. |
| C401.2 | Estimate the stresses that will develop in the soil. |
| C401.3 | Solve any practical problems related to soil stresses estimation, and seepage including flow net diagram. |
| C401.4 | Solve the lateral pressure by different methods. |
| C401.5 | Carry out stability analysis and settlement calculation & solve the SBC of the soil. |

| Course Name: Geotechnical Engineering-II (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVI71 | | | | | | | | | | | | | | | |
| POs & PSOs of Geotechnical Engineering-II (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C401.1 | 3 | 2 | 1 | | | | | | | | | | 1 | 3 | 1 |
| C401.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C401.3 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C401.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C401.5 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C401 | 2.4 | 2.6 | 1 | 1.25 | | | | | | | | | 1 | 3 | 1.8 |

| Course Name: Estimation and Valuation (IC) | |
|--|--|
| Course Code: 15CVI72 | |
| Course outcomes of Estimation and Valuation (IC) | |
| Sl. No. | Course Outcomes |
| C402.1 | Explain types of estimate and duties of an Estimator |
| C402.2 | Undertake rate analysis of civil engineering works. |
| C402.3 | Determine the rates of various items of civil works. |
| C402.4 | Calculate estimated cost of civil construction projects. |
| C402.5 | Evaluate the actual value of any property. |

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|--|
| Course Name: Estimation and Valuation (IC) |
|--|

| Course Code: 15CVI72 | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----|-----|-----|------|-----|------|------|------|------|------|------|
| POs & PSOs of Estimation and Valuation (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C402.1 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402.2 | 2 | 2 | 1 | | | | 1 | 2 | | | 2 | 1 | 3 | 3 | 2 |
| C402.3 | 2 | 2 | 1 | 1 | | | | | | | 1 | 1 | 3 | 3 | 1 |
| C402.4 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402.5 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402 | 2.6 | 2 | 1.6 | 1.75 | | 2 | 1 | 1.25 | | | 1.8 | 1.6 | 3 | 3 | 1.8 |

| Course Name: Construction Industry Practice-III | |
|---|---|
| Course Code: 15CVT731 | |
| Course outcomes of Construction Industry Practice-III | |
| Sl. No. | Course Outcomes |
| C403a.1 | Gain the knowledge about detailing of Structural elements. |
| C403a.2 | Develop Creativity and leadership qualities. |
| C403a.3 | Acquire the knowledge about good practices and safety requirement of Buildings. |
| C403a.4 | Gain the information about durability of buildings. |
| C403a.5 | Obtain the knowledge about quality control and sustainability of buildings. |

| Course Name: Construction Industry Practice-III | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT731 | | | | | | | | | | | | | | | |
| POs & PSOs of Construction Industry Practice-III | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C403a.1 | 3 | | | | | | | | 2 | 1 | 3 | | | 2 | |
| C403a.2 | 3 | | | | | | | | | 1 | 3 | | | 2 | |
| C403a.3 | 3 | | 2 | | | | | | | 1 | 3 | | | 2 | |
| C403a.4 | 3 | | | | | | | | | 1 | 3 | | | 2 | |
| C403a.5 | 3 | | 2 | | | | 3 | | | 1 | 3 | | | 2 | |
| C403a | 3 | | 2 | | | | 3 | | 2 | 1 | 3 | | | 2 | |

| Course Name: Pre-Stressed Concrete Structures | |
|---|---|
| Course Code: 15CVT732 | |
| Course outcomes of Pre-Stressed Concrete Structures | |
| Sl. No. | Course Outcomes |
| C403b.1 | Apply the knowledge of pre stressing, devices and different tensioning systems. |
| C403b.2 | Analyse the stresses due to different loads. |
| C403b.3 | Calculate losses in PSC members. |
| C403b.4 | Determine the limit state of PSC beams in flexure and shear. |
| C403b.5 | Design end block and determine anchorage zone stress in members. |

| Course Name: Pre-Stressed Concrete Structures | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT732 | | | | | | | | | | | | | | | |
| POs & PSOs of Pre-Stressed Concrete Structures | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C403b.1 | 3 | 3 | 3 | 3 | 2 | | | | | | | 1 | 3 | 3 | 1 |
| C403b.2 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403b.3 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403b.4 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403b.5 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403b | 3 | 3 | 3 | 3 | 2 | | | | | | | 1 | 3 | 3 | 1 |

| Course Name: Fire safety and management | |
|---|---|
| Course Code: 15CVT741 | |
| Course outcomes of Fire safety and management | |
| Sl. No. | Course Outcomes |
| C404a.1 | Make familiar about basic concepts of fire and explosion science. |
| C404a.2 | Know the different source of ignition and their prevention techniques. |
| C404a.3 | Understand the operation of various types of fire fighting equipment's. |
| C404a.4 | Understand the causes and prevention of explosion. |
| C404a.5 | Equip to effectively employ explosion protection techniques and their significances to suit the industrial requirement. |

| Course Name: Fire safety and management | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT741 | | | | | | | | | | | | | | | |
| POs & PSOs of Fire safety and management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C404a.1 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.2 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.3 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.4 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.5 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |

| Course Name: Industrial Waste Water treatment | |
|---|--|
| Course Code: 15CVT743 | |
| Course outcomes of Industrial Waste Water treatment | |
| Sl. No. | Course Outcomes |
| C404b.1 | Understand the effect of parameters of pollution on receiving streams. |
| C404b.2 | Advise the regulating authority about the possible danger specific industries. |
| C404b.3 | Develop planning skill in designing water pollution control systems in industries. |
| C404b.4 | Differentiate red category industries from green category industries. |
| C404b.5 | Characterize the different effluents from specific industries. |

| Course Name: Industrial Waste Water treatment | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVT743 | | | | | | | | | | | | | | | |
| POs & PSOs of Industrial Waste Water treatment | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C404b.1 | 1 | | | | | 3 | 2 | 1 | | | | 1 | 1 | 1 | 3 |
| C404b.2 | 2 | 3 | | | | 1 | 1 | 2 | | | | | 1 | 1 | 3 |
| C404b.3 | 2 | 1 | | | | 1 | 3 | | | | | | 2 | 1 | 3 |
| C404b.4 | 2 | 3 | | | 3 | 1 | 1 | | | | | | 1 | 1 | 3 |
| C404b.5 | 2 | 1 | 3 | | | 2 | 1 | | | | | | 1 | 1 | 3 |
| C404b | 1.8 | 2 | 3 | | 3 | 1.6 | 1.6 | 1.5 | | | | 1 | 1.2 | 1 | 3 |

| Course Name: Natural Disaster Mitigation and Management | |
|---|---|
| Course Code: 15HOE753 | |
| Course outcomes of Natural Disaster Mitigation and Management | |
| Sl. No. | Course Outcomes |
| C405a.1 | Learn about the types of natural and environmental disaster and its causes. |
| C405a.2 | Learn about organizational and administrative strategies for managing disasters. |
| C405a.3 | Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation. |
| C405a.4 | Apply the key roles of capacity building to face disaster among government bodies, institutions, NGOS. |
| C405a.5 | Learn methodologies of disaster risk assessment with the help of latest tools like GPS, GIS AND Remote sensing. |

| Course Name: Natural Disaster Mitigation and Management | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15HOE753 | | | | | | | | | | | | | | | |
| POs & PSOs of Natural Disaster Mitigation and Management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C405a.1 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405a.2 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405a.3 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405a.4 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405a.5 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405a | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 15HOE754 | |
| Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C405b.1 | Learn the use of different online tools. |
| C405b.2 | Analyse the problems. |
| C405b.3 | Communicate effectively on engineering activities. |
| C405b.4 | Design and develop solutions for complex problems. |
| C405b.5 | Apply the knowledge of engineering fundamentals. |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
|--|-----|-----|------|------|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15HOE754 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C405b.1 | 2 | 1 | | 2 | 3 | | | | | | | | 1 | 3 | 1 |
| C405b.2 | 1 | 3 | 2 | | 1 | | | | | | | | 1 | 3 | 1 |
| C405b.3 | 2 | 1 | 1 | | | | | | | 3 | | | 1 | 3 | 1 |
| C405b.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | 1 |
| C405b.5 | 3 | 2 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C405b | 1.8 | 1.8 | 1.75 | 1.67 | 1.33 | | | | | 3 | | | 1 | 3 | 1 |

| Course Name: Occupational Safety and Health Administration | |
|--|--|
| Course Code: 15HOE762 | |
| Course outcomes of Occupational Safety and Health Administration | |
| Sl. No. | Course Outcomes |
| C406a.1 | Develop the ability to know the occupational health and safety. |
| C406a.2 | Know the socio - economic aspects of occupational health and safety. |
| C406a.3 | Demonstrate purpose of health screening measures. |

| | |
|---------|--|
| C406a.4 | Know the legal provisions on occupational health and safety. |
| C406a.5 | Participate in research and occupational health. |

| Course Name: Occupational Safety and Health Administration | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15HOE762 | | | | | | | | | | | | | | | |
| POs & PSOs of Occupational Safety and Health Administration | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C406a.1 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.2 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.3 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.4 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.5 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 15HOE764 | |
| Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C406b.1 | Creating basic drawings by using REVIT |
| C406b.2 | Manipulating objects in the drawing. |
| C406b.3 | Drawing organization and inquiry commands. |

| | |
|---------|---------------------------------|
| C406b.4 | Hatching objects |
| C406b.5 | Working with reusable contents. |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15HOE764 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C406b.1 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.2 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.3 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.4 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.5 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |

| Course Name: Project Management Lab | |
|---|--|
| Course Code: 15CVL77 | |
| Course outcomes of Project Management Lab | |
| Sl. No. | Course Outcomes |
| C407.1 | Preparing project plans, schedule of construction. |
| C407.2 | Understanding the construction management software. |
| C407.3 | Understanding construction network and time estimates. |
| C407.4 | Understanding the concepts of construction project management. |
| C407.5 | Creating the construction project reports. |

| Course Name: Project Management Lab | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVL77 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Management Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C407.1 | 3 | 3 | | | 3 | | | | | | 3 | | 1 | 2 | 1 |
| C407.2 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 2 | 1 |
| C407.3 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 2 | 1 |
| C407.4 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 3 | 1 |
| C407.5 | 3 | 3 | | | 3 | | | | | | 3 | | 1 | 2 | 1 |
| C407 | 3 | 3 | | | 3 | | | | | | 3 | | 1.6 | 2.2 | 1 |

| Course Name: Analysis and Design Lab-II | |
|---|---|
| Course Code: 15CVL78 | |
| Course outcomes of Analysis and Design Lab-II | |
| Sl. No. | Course Outcomes |
| C408.1 | Design and Analysis of Different components of Structures |
| C408.2 | Apply Spreadsheet calculations to Civil Engineering |
| C408.3 | Analyse water resource networks |
| C408.4 | Apply computing skills to geotechnical engineering |
| C408.5 | Make use of various software package |

| Course Name: Analysis and Design Lab-II | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVL78 | | | | | | | | | | | | | | | |
| POs & PSOs of Analysis and Design Lab-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C408.1 | 1 | 3 | 3 | 1 | 3 | | | | | | | 1 | 1 | 3 | 1 |
| C408.2 | 1 | 2 | | 1 | 2 | | | | | | | | 1 | 3 | 1 |
| C408.3 | 2 | 2 | | | 1 | | | | | | | | 1 | 2 | 1 |
| C408.4 | 1 | 2 | | | | | | | | | | | 1 | 2 | 1 |
| C408.5 | 2 | 1 | | | 3 | | | | | | | 1 | 2 | 2 | 2 |
| C408 | 1.4 | 2 | 3 | 1 | 2.25 | | | | | | | 1 | 1.2 | 2.4 | 1.2 |

| Course Name: Project Phase-I | |
|------------------------------------|---|
| Course Code: 15CVP79 | |
| Course outcomes of Project Phase-I | |
| Sl. No. | Course Outcomes |
| C409.1 | Engage more in the learning process |
| C409.2 | Think outside the box by thinking differently about the problem |
| C409.3 | Make deep connections between ideas |
| C409.4 | Make them problem-solvers |
| C409.5 | Learn project management |

| Course Name: Project Phase-I | | | | | | | | | | | | | | | |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVP79 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C409.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C409.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C409.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C409.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C409.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C409 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| Course Name: Project Phase-II | |
|-------------------------------------|---|
| Course Code: 15CVP81 | |
| Course outcomes of Project Phase-II | |
| Sl. No. | Course Outcomes |
| C410.1 | Engage more in the learning process |
| C410.2 | Think outside the box by thinking differently about the problem |
| C410.3 | Make deep connections between ideas |
| C410.4 | Make them problem-solvers |
| C410.5 | Learn project management |

| Course Name: Project Phase-II | | | | | | | | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVP81 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C410.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C410.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C410.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C410.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C410.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C410 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| Course Name: Project Phase-III | |
|--------------------------------------|---|
| Course Code: 15CVP82 | |
| Course outcomes of Project Phase-III | |
| Sl. No. | Course Outcomes |
| C411.1 | Engage more in the learning process |
| C411.2 | Think outside the box by thinking differently about the problem |
| C411.3 | Make deep connections between ideas |
| C411.4 | Make them problem-solvers |
| C411.5 | Learn project management |

| Course Name: Project Phase-III | | | | | | | | | | | | | | | |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVP82 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-III | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C411.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C411.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C411.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C411.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C411.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C411 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| Course Name: Evaluation and Viva voce (External) | |
|--|---|
| Course Code: 15CVP83 | |
| Course outcomes of Evaluation and Viva voce (External) | |
| Sl. No. | Course Outcomes |
| C412.1 | Engage more in the learning process |
| C412.2 | Think outside the box by thinking differently about the problem |
| C412.3 | Make deep connections between ideas |
| C412.4 | Make them problem-solvers |
| C412.5 | Learn project management |

| Course Name: Evaluation and Viva voce (External) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15CVP83 | | | | | | | | | | | | | | | |
| POs & PSOs of Evaluation and Viva voce (External) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C412.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C412.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C412.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C412.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C412.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C412 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

Nagarjuna College of Engineering and Technology

Department of Civil Engineering – 2016 Scheme

| Course Name: Engineering Mathematics-III (IC) | |
|---|--|
| Course Code: 16CVM31 | |
| Course outcomes of Engineering Mathematics-III (IC) | |
| Sl. No. | Course Outcomes |
| C201.1 | Form a partial differential equations and their solutions. |
| C201.2 | Expressing the given functions as infinite series and their solutions. |
| C201.3 | Solve the functional and variations problems. |
| C201.4 | Find approximated solutions by numerical methods. |
| C201.5 | Use the SCILAB to solve the various types engineering problems. |

| Course Name: Engineering Mathematics-III (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVM31 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Mathematics-III (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C201.1 | 3 | 3 | 2 | 3 | 2 | | | 2 | 2 | | | 1 | 1 | 3 | 2 |
| C201.2 | 2 | 3 | 2 | 2 | 2 | | | 1 | 1 | | | 1 | 1 | 2 | 3 |
| C201.3 | 2 | 3 | 2 | 3 | 3 | | | 1 | 1 | | | 1 | 1 | 2 | 3 |
| C201.4 | 2 | 3 | 2 | 2 | 3 | | | 1 | 1 | | | 1 | 1 | 3 | 3 |
| C201.5 | 2 | 2 | 3 | 2 | 3 | | | 1 | 1 | | | 1 | 1 | 3 | 2 |
| C201 | 2.2 | 2.8 | 2.2 | 2.4 | 2.6 | | | 1.2 | 1.2 | | | 1 | 1 | 2.6 | 2.6 |

| Course Name: Building Materials and Concrete Technology | |
|---|--|
| Course Code:16CVT32 | |
| Course outcomes of Building Materials and Concrete Technology | |
| Sl. No. | Course Outcomes |
| C202.1 | Recognize the materials used in construction. |
| C202.2 | Describe the physical and mechanical properties of variety of materials. |
| C202.3 | Identify the functional components of a building. |
| C202.4 | Describe the construction process of various components of a building. |
| C202.5 | Explain the fundamental principles and procedures in repairing concrete. |

| Course Name: Building Materials and Concrete Technology | | | | | | | | | | | | | | | |
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| Course Code: 16CVT32 | | | | | | | | | | | | | | | |
| POs & PSOs of Building Materials and Concrete Technology | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C202.1 | 3 | 2 | | | | 1 | 1 | | | | | 1 | 3 | 3 | 1 |
| C202.2 | 2 | 1 | 2 | 3 | | 1 | | | | | | | 3 | 3 | 1 |
| C202.3 | 2 | 3 | | 1 | | | 1 | | | | | | 3 | 3 | 1 |
| C202.4 | 3 | 2 | 1 | 2 | | | | | | | | 1 | 3 | 3 | 1 |
| C202.5 | 2 | 2 | 3 | | | | 1 | | | | | 1 | 3 | 3 | 1 |
| C202 | 2.4 | 2 | 2 | 2 | | 1 | 1 | | | | | 1 | 3 | 3 | 1 |

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|--|--|
| Course Name: Strength of Materials | |
| Course Code:16CVT33 | |
| Course outcomes of Strength of Materials | |
| Sl. No. | Course Outcomes |
| C203.1 | Describe the fundamental concepts of stress and strain under elastic limits. |
| C203.2 | Analyse SFD and BMD for beams. |
| C203.3 | Determine the buckling loads of a long columns. |
| C203.4 | Determine deflection in beams under different loading conditions. |
| C203.5 | Analyse the bending stress and shear stress in the beams. |

| Course Name: Strength of Materials | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT33 | | | | | | | | | | | | | | | |
| POs & PSOs of Strength of Materials | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C203.1 | 1 | 3 | 2 | | | | | | | | | | 2 | 3 | 1 |
| C203.2 | 2 | 2 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C203.3 | 1 | 3 | 2 | 2 | | | | | | | | | 3 | 3 | 1 |
| C203.4 | 2 | 3 | 2 | 1 | | | | | | | | | 3 | 3 | 1 |
| C203.5 | 2 | 3 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C203 | 1.6 | 2.8 | 1.6 | 2.25 | | | | | | | | | 2.8 | 3 | 1 |

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|------------------------------|---|
| Course Name: Surveying | |
| Course Code: 16CVT34 | |
| Course outcomes of Surveying | |
| Sl. No. | Course Outcomes |
| C204.1 | Identify the basics involved in different types of surveying like tape, compass, levelling and theodolite/ total station. |
| C204.2 | Recognize the skills in performing measurement of distance, angles and levelling. |
| C204.3 | Develop skills for estimating the strengths between given points, area of a given plot and earth work involved in cutting and fillings. |
| C204.4 | Develop skill to carry out tachometry, geodetic surveying wherever situations demands and curve setting. |
| C204.5 | Apply error adjustment to the recorded reading to get an accurate surveying output. |

| Course Name: Surveying | | | | | | | | | | | | | | | |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT34 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C204.1 | 3 | 3 | 2 | | 3 | 1 | | | 2 | 3 | | 1 | 3 | 3 | 1 |
| C204.2 | 3 | 3 | 1 | 1 | | | | | 2 | 2 | | 1 | 3 | 3 | 1 |
| C204.3 | 3 | 3 | 2 | 1 | 3 | | | | 2 | 2 | | 2 | 3 | 3 | 1 |
| C204.4 | 3 | 3 | 2 | 2 | | | | | 2 | 3 | | 2 | 3 | 3 | 1 |
| C204.5 | 3 | 2 | 1 | | | | | | 1 | 1 | | 1 | 3 | 1 | 1 |
| C204 | 3 | 2.8 | 1.6 | 1.3 | 3 | 1 | | | 1.8 | 2.2 | | 1.4 | 3 | 2.6 | 1 |

| Course Name: Engineering Geology (IC) | |
|---|---|
| Course Code: 16CVI35 | |
| Course outcomes of Engineering Geology (IC) | |
| Sl. No. | Course Outcomes |
| C205.1 | Describe earth and its internal structure to identify natural resources useful for construction |
| C205.2 | Recognize good building materials and their properties |
| C205.3 | Explain earth processes and its effect on engineering construction |
| C205.4 | Effect of geological structure on engineering structure |
| C205.5 | Identify the formation, distribution and conservation of water resources |

| Course Name: Engineering Geology (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI35 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Geology (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C205.1 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C205.2 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 1 |
| C205.3 | 3 | 2 | | | | 1 | | | | | | | 1 | 3 | 1 |
| C205.4 | 2 | 3 | 1 | | | | | | | | | | 2 | 3 | 1 |
| C205.5 | 3 | 2 | | 1 | | | 1 | | | | | | 1 | 3 | 3 |
| C205 | 2.6 | 2.4 | 1 | 1.3 | | 1 | 1 | | | | | | 1.2 | 3 | 1.4 |

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|--|---|
| Course Name: Rural Water Supply and Sanitation | |
| Course Code: 16CVT362 | |
| Course outcomes of Rural Water Supply and Sanitation | |
| Sl. No. | Course Outcomes |
| C206a.1 | Identify and select water supply systems in rural areas. |
| C206a.2 | Distinguish between urban and rural water supply systems. |
| C206a.3 | Categorize the different types of water borne, communicable diseases and apply the principles of rainwater harvesting. |
| C206a.4 | Explain overall management of rural water supply and other components like milk sanitation. |
| C206a.5 | Examine overall management of solid waste collection, disposal and other components like composting of waste to energy. |

| Course Name: Rural Water Supply and Sanitation | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT362 | | | | | | | | | | | | | | | |
| POs & PSOs of Rural Water Supply and Sanitation | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C206a.1 | 1 | 3 | | | | 2 | | | 1 | | | | 1 | 3 | 3 |
| C206a.2 | 2 | 3 | | | | 1 | | | | | 1 | | 1 | 3 | 3 |
| C206a.3 | 2 | 2 | | | | 3 | 2 | 1 | | | | | 2 | 3 | 3 |
| C206a.4 | | | | | | 1 | 2 | | | 1 | 3 | | 2 | 3 | 3 |
| C206a.5 | 1 | | | | | 2 | 3 | | | | 3 | | 2 | 3 | 3 |
| C206a | 1.5 | 2.6 | | | | 1.8 | 2.3 | 1 | 1 | 1 | 2.3 | | 1.6 | 3 | 3 |

| Course Name: Solid Waste Management | |
|---|---|
| Course Code: 16CVT363 | |
| Course outcomes of Solid Waste Management | |
| Sl. No. | Course Outcomes |
| C206b.1 | Explain the components of solid waste management and the laws governing it. |
| C206b.2 | Describe the solid waste collection systems, route optimization techniques and processing of solid waste. |
| C206b.3 | Design, operation, maintenance of landfills and composting units. |
| C206b.4 | Analyse the different sanitary landfilling methods and suggest suitable methods for landfilling. |
| C206b.5 | Discuss the importance and techniques of all major and minor methods of disposal considering plastic and bio - medical waste. |

| Course Name: Solid Waste Management | | | | | | | | | | | | | | | |
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| Course Code: 16CVT363 | | | | | | | | | | | | | | | |
| POs & PSOs of Solid Waste Management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C206b.1 | | | | | | 3 | 2 | 2 | 1 | | | | 3 | 1 | 3 |
| C206b.2 | | 3 | 2 | | | 1 | 1 | | | | | | 2 | 1 | 3 |
| C206b.3 | 1 | 2 | 3 | | | 1 | 1 | | | | | 1 | 3 | 3 | 3 |
| C206b.4 | 1 | 2 | 2 | 3 | | 2 | 2 | | | | | 1 | 3 | 2 | 3 |
| C206b.5 | | | | 1 | | 2 | 3 | 1 | | | | | 3 | 1 | 3 |
| C206b | 1 | 2.3 | 2.3 | 2 | | 1.8 | 1.8 | 1.5 | 1 | | | 1 | 2.8 | 1.6 | 3 |

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|--|--|
| Course Name: Basic Material Testing Laboratory | |
| Course Code: 16CVL37 | |
| Course outcomes of Basic Material Testing Laboratory | |
| Sl. No. | Course Outcomes |
| C207.1 | Identification and classification of aggregates. |
| C207.2 | Conduct compression, tension, bending and shear tests in UTM to determine strength. |
| C207.3 | Perform torsion, hardness, and impact tests to evaluate material properties. |
| C207.4 | Identify and solve engineering problems of structural elements subjected to flexure. |
| C207.5 | Decide the techniques, skills and modern engineering tools necessary for engineering applications. |

| Course Name: Basic Material Testing Laboratory | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL37 | | | | | | | | | | | | | | | |
| POs & PSOs of Basic Material Testing Laboratory | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C207.1 | 3 | 1 | | 2 | | | | | | | | | 3 | 3 | 1 |
| C207.2 | 1 | 2 | | 3 | | | | | | | | | 2 | 3 | 1 |
| C207.3 | 1 | 2 | | 3 | | | | | | | | | 2 | 3 | 1 |
| C207.4 | 2 | 3 | 1 | 1 | | | | | | | | | 2 | 3 | 1 |
| C207.5 | 2 | | 1 | | 3 | | | | | | | | 3 | 3 | 1 |
| C207 | 1.8 | 2 | 1 | 2.25 | 3 | | | | | | | | 2.4 | 3 | 1 |

| Course Name: Surveying Practice-I | |
|---|---|
| Course Code: 16CVL38 | |
| Course outcomes of Surveying Practice-I | |
| Sl. No. | Course Outcomes |
| C208.1 | Explain principles involved in different instruments used in surveying. |
| C208.2 | Apply the concepts of basic mathematics and it's in surveying. |
| C208.3 | Develop skill to measure vertical distances using dumpy level. |
| C208.4 | Determine ground profile by levelling. |
| C208.5 | Illustrate the knowledge of using minor instruments. |

| Course Name: Surveying Practice-I | | | | | | | | | | | | | | | |
|------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL38 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying Practice-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C208.1 | 3 | 3 | 2 | 2 | 3 | | | | 3 | 3 | | 3 | 3 | 3 | 2 |
| C208.2 | 3 | 3 | 1 | 1 | | | | | 2 | 1 | | 2 | 3 | 3 | 1 |
| C208.3 | 3 | 3 | 3 | 2 | 1 | | | | 3 | 2 | | 1 | 3 | 3 | 2 |
| C208.4 | 3 | 3 | 2 | 1 | | | | | 3 | 3 | | 3 | 3 | 3 | 3 |
| C208.5 | 2 | 1 | | | | | | | 1 | 1 | | 1 | 3 | 1 | 1 |
| C208 | 2.8 | 2.6 | 2 | 1.5 | 2 | | | | 2.4 | 2 | | 2 | 3 | 2.6 | 1.8 |

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| Course Name: Integrated Rural Development - Part 1 | |
| Course Code: 16CVH39 | |
| Course outcomes Integrated Rural Development - Part 1 | |
| Sl. No. | Course Outcomes |
| C209.1 | Develop the ability to interact and communicate with different sections of society, thus improving their communication skills. |
| C209.2 | Understand the existing problems and needs of a village, thus developing an awareness of the challenges facing in villages |
| C209.3 | Conceptualize, plan, and realize measures to address these problems, thus improving their practical problem - solving and leadership skills. |
| C209.4 | Make an impact to rural section of society, thus building their self - confidence. |
| C209.5 | Generate reports for the social impacts. |

| Course Name: Integrated Rural Development - Part 1 | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVH39 | | | | | | | | | | | | | | | |
| POs & PSOs of Integrated Rural Development - Part 1 | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C209.1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| C209.2 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C209.3 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| C209.4 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C209.5 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| C209 | 1.4 | 2.2 | 2.8 | 2.8 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.4 | 2.2 | 3 | 3 | 3 |

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|--|---|
| Course Name: Engineering Mathematics-IV (IC) | |
| Course Code: 16CVM41 | |
| Course outcomes of Engineering Mathematics-IV (IC) | |
| Sl. No. | Course Outcomes |
| C210.1 | Determine the differentiation, Integration using numerical methods. |
| C210.2 | Solve differential equations using numerical methods. |
| C210.3 | Find the differentiation and Integrals of complex functions. |
| C210.4 | Find the probability using different distributions and analysis by using samplings. |
| C210.5 | Use the statistical software's. |

| Course Name: Engineering Mathematics-IV (IC) | | | | | | | | | | | | | | | |
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| Course Code: 16CVM41 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Mathematics-IV (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C210.1 | 1 | 2 | 1 | 3 | 3 | | | 2 | 3 | | | 2 | 1 | 2 | 2 |
| C210.2 | 2 | 2 | 2 | 3 | 3 | | | 2 | 2 | | | 2 | 1 | 2 | 3 |
| C210.3 | 2 | 2 | 1 | 3 | 3 | | | 2 | 1 | | | 2 | 1 | 3 | 2 |
| C210.4 | 2 | 2 | 1 | 3 | 3 | | | 1 | 2 | | | 2 | 1 | 2 | 1 |
| C210.5 | 1 | 2 | 1 | 2 | 3 | | | 2 | 2 | | | 2 | 1 | 2 | 2 |
| C210 | 1.6 | 2 | 1.2 | 2.8 | 3 | | | 1.8 | 2 | | | 2 | 1 | 2.2 | 2 |

| Course Name: Fluid Mechanics | |
|------------------------------------|--|
| Course Code: 16CVT42 | |
| Course outcomes of Fluid Mechanics | |
| Sl. No. | Course Outcomes |
| C211.1 | Describe the types of fluid and properties of fluids, fluid pressure measurements. |
| C211.2 | Identify the forces acting on a fluid motion and the relation between pressure and velocity in a flow. |
| C211.3 | Analyse the flow mechanism in pipes along with various losses with simple design of pipes. |
| C211.4 | Distinguish between the concept of flow in open channels for uniform flow and non-uniform flow. |
| C211.5 | Identify the pump required for different purposes and classify the turbines. |

| Course Name: Fluid Mechanics | | | | | | | | | | | | | | | |
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| Course Code: 16CVT42 | | | | | | | | | | | | | | | |
| POs & PSOs of Fluid Mechanics | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C211.1 | 3 | 2 | | 1 | | | | | | | | | 2 | 3 | 3 |
| C211.2 | 2 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 3 |
| C211.3 | 1 | 2 | 3 | 3 | | | | | | | | | 1 | 3 | 3 |
| C211.4 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C211.5 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C211 | 2 | 2.6 | 1.75 | 1.6 | | | | | | | | | 1.4 | 3 | 3 |

| Course Name: Structural Analysis-I | |
|--|---|
| Course Code: 16CVT43 | |
| Course outcomes of Structural Analysis-I | |
| Sl. No. | Course Outcomes |
| C212.1 | Identify different structural systems. |
| C212.2 | Analyse the trusses by different methods. |
| C212.3 | Determine forces and moments in arches and cables under different loading conditions. |
| C212.4 | Compute the deflection of structural elements by different methods. |
| C212.5 | Determine support moments for beams under different support conditions. |

| Course Name: Structural Analysis-I | | | | | | | | | | | | | | | |
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| Course Code: 16CVT43 | | | | | | | | | | | | | | | |
| POs & PSOs of Structural Analysis-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C212.1 | 2 | 3 | | 1 | | | | | | | | | 3 | 3 | 1 |
| C212.2 | 1 | 2 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C212.3 | 1 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C212.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 1 |
| C212.5 | 2 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C212 | 1.6 | 2.8 | 1.5 | 1.6 | | | | | | | | | 2.2 | 3 | 1 |

| Course Name: Building Planning and Drawing (IC) | |
|---|---|
| Course Code: 16CVI44 | |
| Course outcomes of Building Planning and Drawing (IC) | |
| Sl. No. | Course Outcomes |
| C213.1 | Illustrate the knowledge of bonds in brick masonry. |
| C213.2 | Recognize principles of planning using bylaws for building. |
| C213.3 | Develop plan for public health centre, school building and college canteen. |
| C213.4 | Draw plan, elevation and section for various residential buildings. |
| C213.5 | Illustrate the knowledge of electrical, water supply and sanitary services for residential buildings. |

| Course Name: Building Planning and Drawing (IC) | | | | | | | | | | | | | | | |
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| Course Code: 16CVI44 | | | | | | | | | | | | | | | |
| POs & PSOs of Building Planning and Drawing (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C213.1 | 3 | 1 | | | | | | | | | | 1 | 1 | 3 | 1 |
| C213.2 | 3 | 1 | 2 | | | 2 | | 2 | | | | 2 | 3 | 2 | 1 |
| C213.3 | 2 | 2 | 2 | | 3 | 2 | | 2 | 1 | | | 1 | 3 | 2 | 1 |
| C213.4 | 3 | 2 | 2 | 2 | 3 | 1 | | 1 | | | | 2 | 3 | 2 | 1 |
| C213.5 | 2 | 1 | 2 | 1 | 3 | 1 | | | | | | 2 | 1 | 2 | 1 |
| C213 | 2.6 | 1.4 | 2 | 1.5 | 3 | 1.5 | | 1.6 | 1 | | | 1.6 | 2.2 | 2.2 | 1 |

| Course Name: Elements of Construction Industry | |
|--|--|
| Course Code: 16CVT451 | |
| Course outcomes of Elements of Construction Industry | |
| Sl. No. | Course Outcomes |
| C214a.1 | Explain overview of civil engineering professional ethics. |
| C214a.2 | Understand significance of common building materials. |
| C214a.3 | Describe basics structural components and its application. |
| C214a.4 | Understand the basics of planning, execution and importance of the building drawing. |
| C214a.5 | Utilize basics of construction technology and total station surveying. |

| Course Name: Elements of Construction Industry | | | | | | | | | | | | | | | |
|---|-----|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT451 | | | | | | | | | | | | | | | |
| POs & PSOs of Elements of Construction Industry | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C214a.1 | | | | | | 1 | | 3 | | 2 | | 1 | 1 | 3 | 1 |
| C214a.2 | 3 | 1 | | 2 | | | 1 | | | | | | 3 | 3 | 1 |
| C214a.3 | 2 | 3 | 1 | | | | | | | | | | 3 | 3 | 1 |
| C214a.4 | 2 | | 3 | 2 | | | | | | | | | 3 | 3 | 1 |
| C214a.5 | 2 | 1 | | | 3 | | | | | | | | 3 | 3 | 1 |
| C214a | 1.8 | 1.67 | 2 | 2 | 3 | 1 | 1 | 3 | | 2 | | 1 | 2.6 | 3 | 1 |

| Course Name: Advanced Concrete Technology | |
|---|---|
| Course Code: 16CVT453 | |
| Course outcomes of Advanced Concrete Technology | |
| Sl. No. | Course Outcomes |
| C214b.1 | Recognize suitable admixtures to be used in different type of concrete. |
| C214b.2 | Design different grades of concrete. |
| C214b.3 | Discuss the importance of durability of concrete. |
| C214b.4 | Identify the role of reinforcement on concrete properties. |
| C214b.5 | Explain the basic knowledge of emerging concrete. |

| Course Name: Advanced Concrete Technology | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT453 | | | | | | | | | | | | | | | |
| POs & PSOs of Advanced Concrete Technology | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C214b.1 | 3 | 2 | | 2 | 1 | | | | | | | | 3 | 3 | 1 |
| C214b.2 | 2 | 1 | 3 | 1 | | | | | | | | | 2 | 3 | 1 |
| C214b.3 | 3 | 2 | 1 | 2 | | | | | | | | | 2 | 3 | 1 |
| C214b.4 | 2 | 3 | | 1 | | | | | | | | | 3 | 3 | 1 |
| C214b.5 | 3 | 2 | | 1 | | | 1 | | | | | | 2 | 3 | 3 |
| C214b | 2.6 | 2 | 2 | 1.4 | 1 | | 1 | | | | | | 2.4 | 3 | 1.4 |

| | |
|--|---|
| Course Name: Environmental Air Pollution | |
| Course Code: 16CVT462 | |
| Course outcomes of Environmental Air Pollution | |
| Sl. No. | Course Outcomes |
| C215a.1 | Examine emission standards for industrial and other sources. |
| C215a.2 | Identify air pollution concentrations as a function of emission, meteorology, topography and the built environment. |
| C215a.3 | Discuss impact of air pollution on health of humans, animals, plants and materials. |
| C215a.4 | Identify different equipment's for air quality monitoring and control. |
| C215a.5 | Distinguish between global and local effects of air pollution, recognize the legal aspects of air pollution. |

| Course Name: Environmental Air Pollution | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT462 | | | | | | | | | | | | | | | |
| POs & PSOs of Environmental Air Pollution | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C215a.1 | 1 | | | | | 3 | 2 | 1 | | | | 1 | 1 | 1 | 3 |
| C215a.2 | 2 | 3 | | | | 1 | 1 | 1 | | | | | 1 | 1 | 3 |
| C215a.3 | 2 | 1 | | | | 1 | 3 | | | | | | 1 | 1 | 3 |
| C215a.4 | 2 | 3 | | | 3 | 1 | 1 | | | | | | 1 | 1 | 3 |
| C215a.5 | 2 | 1 | 3 | | | 2 | 1 | | | | | | 1 | 1 | 3 |
| C215a | 2 | 2 | 3 | | 3 | 1.6 | 1.6 | 1 | | | | 1 | 1 | 1 | 3 |

| | |
|---|--|
| Course Name: Remote Sensing and GIS | |
| Course Code: 16CVT463 | |
| Course outcomes of Remote Sensing and GIS | |
| Sl. No. | Course Outcomes |
| C215b.1 | Describe remote sensing technology. |
| C215b.2 | Explain different types of sensors and platforms. |
| C215b.3 | Create GIS maps and interpretation. |
| C215b.4 | Process about the hyper spectral remote sensing systems. |
| C215b.5 | Apply RS and GIS in Civil Engineering |

| Course Name: Remote Sensing and GIS | | | | | | | | | | | | | | | |
|--------------------------------------|-----|------|-----|------|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT463 | | | | | | | | | | | | | | | |
| POs & PSOs of Remote Sensing and GIS | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C215b.1 | 3 | | | | 2 | 1 | | | | | | | 3 | 3 | 2 |
| C215b.2 | 1 | | | 2 | 3 | | | | | | | 1 | 3 | 3 | 1 |
| C215b.3 | 2 | 1 | 3 | 2 | | | | | 1 | | | 1 | 3 | 3 | 3 |
| C215b.4 | 1 | 2 | 2 | 3 | 1 | | | | | | | | 3 | 3 | 1 |
| C215b.5 | 3 | 2 | 1 | | 1 | | | | 1 | | | | 3 | 3 | 1 |
| C215b | 2 | 1.67 | 2 | 2.33 | 1.75 | 1 | | | 1 | | | 1 | 3 | 3 | 1.6 |

| Course Name: Concrete Laboratory | |
|--|---|
| Course Code: 16CVL47 | |
| Course outcomes of Concrete Laboratory | |
| Sl. No. | Course Outcomes |
| C216.1 | identify the relevant physical properties pertaining to the construction materials |
| C216.2 | Identify the suitability of the materials for the construction works. |
| C216.3 | Recommend the relevant IS testing procedure to be carried out to ascertain the quality of building materials. |
| C216.4 | Design a concrete mix as per IS 10262:2009 |
| C216.5 | Recognize the construction techniques to be followed in Brick and Stone Masonry |

| Course Name: Concrete Laboratory | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|------|------|-----|------|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL47 | | | | | | | | | | | | | | | |
| POs & PSOs of Concrete Laboratory | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C216.1 | 2 | 2 | | | 1 | 1 | 2 | | 2 | 2 | | 3 | 1 | 2 | 1 |
| C216.2 | 3 | 2 | | 2 | 1 | 1 | 2 | | 2 | 2 | | 3 | 3 | 3 | 1 |
| C216.3 | 3 | 2 | 2 | 1 | | 2 | | | 2 | 2 | | 2 | 3 | 2 | 1 |
| C216.4 | 3 | 2 | 3 | | | 1 | 1 | | 1 | 1 | | 2 | 3 | 3 | 1 |
| C216.5 | 3 | 2 | | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 3 | 3 | 1 |
| C216 | 2.8 | 2 | 2.5 | 1.67 | 1.33 | 1.2 | 1.67 | | 1.8 | 1.8 | 2 | 2.4 | 2.6 | 2.6 | 1 |

| | |
|--|--|
| Course Name: Surveying Practice-II | |
| Course Code: 16CVL48 | |
| Course outcomes of Surveying Practice-II | |
| Sl. No. | Course Outcomes |
| C217.1 | Recognise the importance of theodolite in the field of surveying. |
| C217.2 | Construct the simple curves using different linear methods. |
| C217.3 | Illustrate the concepts and principles in setting out simple and compounds curves. |
| C217.4 | Illustrate the use of total station in the different fields of surveying. |
| C217.5 | Compute the coordinates and to measure distances using GPS. |

| Course Name: Surveying Practice-II | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL48 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying Practice-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C217.1 | 3 | 3 | 2 | | 1 | | | | 3 | 2 | | 2 | 3 | 3 | 1 |
| C217.2 | 3 | 3 | 3 | 1 | 1 | | | | 2 | | | 2 | 3 | 3 | 1 |
| C217.3 | 3 | 3 | 3 | 1 | 1 | | | | 2 | | | 2 | 3 | 3 | 1 |
| C217.4 | 2 | 2 | 2 | | 3 | | | | 3 | 2 | | 3 | 3 | 3 | 2 |
| C217.5 | 3 | 1 | | | 3 | | | | 2 | 1 | | 3 | 3 | 2 | 1 |
| C217 | 2.8 | 2.4 | 2.5 | 1 | 1.8 | | | | 2.4 | 1.67 | | 2.4 | 3 | 2.8 | 1.2 |

| | |
|--|---|
| Course Name: Integrated Rural Development - Part 2 | |
| Course Code: 16CVH49 | |
| Course outcomes of Integrated Rural Development - Part 2 | |
| Sl. No. | Course Outcomes |
| C218.1 | Further develop their social and communication skills by interacting with residents of the village and within their team. |
| C218.2 | Conceptualize long term solution to challenges in villages, thus developing a sense of entrepreneurship. |
| C218.3 | Make an impact to rural sections of society, thus building their self-confidence. |
| C218.4 | Deep understanding the socio economic problems. |
| C218.5 | Improve the quality of Education in villages. |

| Course Name: Integrated Rural Development - Part 2 | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVH49 | | | | | | | | | | | | | | | |
| POs & PSO's of Integrated Rural Development - Part 2 | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C218.1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| C218.2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C218.3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| C218.4 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C218.5 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| C218 | 2 | 2.2 | 2.8 | 2.8 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.4 | 2.2 | 3 | 3 | 3 |

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|--|--|
| Course Name: Transportation Engineering (IC) | |
| Course Code: 16CVI51 | |
| Course outcomes of Transportation Engineering (IC) | |
| Sl. No. | Course Outcomes |
| C301.1 | Detailed study of road transport that includes characteristics features, various committee. Recommendations, different road patterns and road development programs in India. |
| C301.2 | Factors influencing road alignment, different types of road surveys and factors influencing geometric design. |
| C301.3 | Horizontal and vertical alignment, Pavement materials and its properties. |
| C301.4 | Pavement design as per IRC and details of pavement. |
| C301.5 | Importance of Highway Drainage system and Highway Economics. |

| Course Name: Transportation Engineering (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI51 | | | | | | | | | | | | | | | |
| POs & PSOs of Transportation Engineering (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C301.1 | 3 | 2 | | 3 | | 2 | | | | 1 | | | 2 | 2 | 1 |
| C301.2 | 3 | 3 | 2 | 2 | | 1 | | | | | | | 2 | 1 | 1 |
| C301.3 | 3 | 3 | 2 | 2 | | 1 | | | | | | | 2 | 2 | 1 |
| C301.4 | 3 | 2 | 3 | 2 | | 1 | | | | | | | 1 | 3 | 1 |
| C301.5 | 2 | 3 | 1 | 2 | | 1 | | | | 2 | | | 1 | 2 | 1 |
| C301 | 2.8 | 2.6 | 2 | 2.2 | | 1.2 | | | | 1.5 | | | 1.6 | 2 | 1 |

| Course Name: Structural Analysis-II | |
|---|---|
| Course Code: 16CVT52 | |
| Course outcomes of Structural Analysis-II | |
| Sl. No. | Course Outcomes |
| C302.1 | Analyse beams and frames by slope deflection method |
| C302.2 | To solve the problems connected with analysis of various structural components |
| C302.3 | To analyse the given frames by suitable method. |
| C302.4 | To evaluate the continuous beams by suitable methods. |
| C302.5 | To understand the basic concepts of principles of dynamics, Rolling load analysis and influence line diagram for S.S beams. |

| Course Name: Structural Analysis-II | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT52 | | | | | | | | | | | | | | | |
| POs & PSOs of Structural Analysis-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C302.1 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 2 |
| C302.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C302.3 | 2 | 3 | 2 | 1 | | | | | | | | | 1 | 3 | 1 |
| C302.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 2 |
| C302.5 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C302 | 1 | 2 | | 1.3 | | | | | | | | | | 1.8 | 2 |

| Course Name: Design of RCC Structural Elements (IC) | |
|---|--|
| Course Code: 16CVI53 | |
| Course outcomes of Design of RCC Structural Elements (IC) | |
| Sl. No. | Course Outcomes |
| C303.1 | Recognize the design philosophies of reinforced concrete structures. |
| C303.2 | Apply the principles, procedures and current code requirements to the analysis and design of reinforced concrete beams using limit state method. |
| C303.3 | Understand and Design Reinforced Concrete slabs. |
| C303.4 | Analyse and Design the Reinforced Concrete Columns and stair cases. |
| C303.5 | Design structures for serviceability and footings. |

| Course Name: Design of RCC Structural Elements (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI53 | | | | | | | | | | | | | | | |
| POs & PSOs of Design of RCC Structural Elements (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C303.1 | 1 | 3 | | 2 | | | | | | | | | 1 | 3 | |
| C303.2 | 2 | 3 | | 1 | | | | 1 | | | | | 1 | 3 | |
| C303.3 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303.4 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303.5 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303 | 1.8 | 2.4 | 3 | 1 | | | | 1 | | | | | 1 | 3 | |

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|---|--|
| Course Name: Construction Industry Practice-I | |
| Course Code: 16CVT541 | |
| Course outcomes of Construction Industry Practice-I | |
| Sl. No. | Course Outcomes |
| C304a.1 | apply the knowledge of civil engineering |
| C304a.2 | Apply different type of Loads of Structures and their impact on structural elements. |
| C304a.3 | Understand Concrete applications in civil engineering. |
| C304a.4 | Understand Construction Methodologies. |
| C304a.5 | Analyse Masonry structures Specification/ Tendering and Contract Documentations. |

| Course Name: Construction Industry Practice-I | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT541 | | | | | | | | | | | | | | | |
| POs & PSOs of Construction Industry Practice-I | | | | | | | | | | | | | | | |
| POS CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C304a.1 | 3 | 2 | 1 | | | | | | | | | | | 3 | |
| C304a.2 | 3 | 3 | | 1 | | | | | | | | | | 3 | |
| C304a.3 | 3 | 2 | 1 | | | | | | | | | | | 2 | |
| C304a.4 | 3 | 3 | 2 | 1 | | | | | | | | | | 3 | |
| C304a.5 | 3 | | | | | | | | | | | | | 3 | |
| C304a | 3 | 2.5 | 1.3 | 1 | | | | | | | | | | 2.8 | |

| | |
|--|---|
| Course Name: Traffic Engineering | |
| Course Code: 16CVT543 | |
| Course outcomes of Traffic Engineering | |
| Sl. No. | Course Outcomes |
| C304b.1 | The objective and scope of traffic engineering and traffic characteristics. |
| C304b.2 | Understand interpretation of the traffic study and traffic flow theory. |
| C304b.3 | Conduct traffic studies and analyse traffic data |
| C304b.4 | Design traffic signal systems |
| C304b.5 | Understand traffic regulation and control and ITS. |

| Course Name: Traffic Engineering | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT543 | | | | | | | | | | | | | | | |
| POs & PSOs of Traffic Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C304b.1 | 3 | | 3 | | | | | | | | | 2 | 2 | 2 | 1 |
| C304b.2 | 2 | 2 | | 2 | | | | | | | | 2 | 3 | 2 | 1 |
| C304b.3 | | 2 | 3 | 3 | | | | | | | | 3 | 2 | 2 | 1 |
| C304b.4 | | 2 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C304b.5 | 1 | | | | 2 | 2 | | | | | | 2 | 1 | 2 | 1 |
| C304b | 2 | 2 | 2.6 | 2 | 2 | 2 | | | | | | 2.25 | 2 | 2.2 | 1 |

| Course Name: Construction Management and Engineering Economics | |
|--|---|
| Course Code: 16CVI552 | |
| Course outcomes of Construction Management and Engineering Economics | |
| Sl. No. | Course Outcomes |
| C305.1 | Understand the nature of construction industry and the importance of management |
| C305.2 | Formulate project management principles to solve problems on construction network and time estimates. |
| C305.3 | Understand the importance of Resources management in construction |
| C305.4 | Apply the concepts of economics and finance in constructions |
| C305.5 | Understand the concepts of financial management in construction and construction accounting. |

| Course Name: Construction Management and Engineering Economics | | | | | | | | | | | | | | | |
|---|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI552 | | | | | | | | | | | | | | | |
| POs & PSOs of Construction Management and Engineering Economics | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C305.1 | 2 | | | | | | | | 2 | | 3 | | | 3 | |
| C305.2 | 3 | 3 | | 1 | 2 | | | | | | 3 | | | 3 | |
| C305.3 | 3 | 3 | | 3 | | | | | 1 | 1 | 3 | | | 3 | |
| C305.4 | | | | | | 1 | | | | | 3 | | | 3 | |
| C305.5 | 1 | | | | | | | | | | 3 | | | 3 | |
| C305 | 2.25 | 3 | | 2 | 2 | 1 | | | 1.5 | 1 | 3 | | | 3 | |

| Course Name: Hydrology and Irrigation Engineering | |
|---|---|
| Course Code: 16CVT563 | |
| Course outcomes of Hydrology and Irrigation Engineering | |
| Sl. No. | Course Outcomes |
| C306.1 | Apply the knowledge of hydrology to estimate the availability of rainfall with respect to time and space. |
| C306.2 | Analyse the various types of water losses to forecast runoff. |
| C306.3 | Plan and design flood estimation aspects. |
| C306.4 | Understand the fundamentals principles of irrigation engineering. |
| C306.5 | Investigate crop water requirements and design of canal systems. |

| Course Name: Hydrology and Irrigation Engineering | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT563 | | | | | | | | | | | | | | | |
| POs & PSOs of Hydrology and Irrigation Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C306.1 | 3 | 2 | | 1 | | | 2 | | | | | | 2 | 3 | 3 |
| C306.2 | 1 | 2 | | 3 | | | 2 | | | | | | 1 | 3 | 3 |
| C306.3 | 1 | 2 | 3 | | | | 1 | | | | | | 3 | 3 | 3 |
| C306.4 | 3 | 2 | | | | | 1 | | | | | | 1 | 3 | 3 |
| C306.5 | 1 | 2 | 3 | | | | 1 | | | | | 1 | 1 | 3 | 3 |
| C306 | 1.8 | 2 | 3 | 2 | | | 1.4 | | | | | 1 | 1.6 | 3 | 3 |

| Course Name: Fluid Mechanics Lab | |
|--|---|
| Course Code: 16CVL57 | |
| Course outcomes of Fluid Mechanics Lab | |
| Sl. No. | Course Outcomes |
| C307.1 | Apply the knowledge gained in the field of fluid mechanics and hydraulics. |
| C307.2 | Demonstrate and analyse static and dynamic fluid conditions. |
| C307.3 | Gain knowledge about measurement of flows and will be able to calibrate them. |
| C307.4 | Estimate the major loss of head in pipe flow. |
| C307.5 | Analyse the impact of jets on various types of vanes and evaluate performance characteristics of turbines and pump. |

| Course Name: Fluid Mechanics Lab | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL57 | | | | | | | | | | | | | | | |
| POs & PSOs of Fluid Mechanics Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C307.1 | 3 | 2 | | | | | 1 | | | | | | 1 | 3 | 3 |
| C307.2 | 1 | 2 | | 3 | | | | | | | | | 1 | 3 | 2 |
| C307.3 | 3 | 2 | | 1 | 1 | | | | | | | | 3 | 3 | 2 |
| C307.4 | 2 | 3 | | 1 | | | | | 1 | | | | 1 | 3 | 3 |
| C307.5 | 2 | 2 | | 3 | | | | | 1 | | | | 1 | 3 | 3 |
| C307 | 2.2 | 2.2 | | 2 | 1 | | 1 | | 1 | | | | 1.4 | 3 | 2.6 |

| Course Name: Analysis and Design Lab-I | |
|--|--|
| Course Code: 16CVL58 | |
| Course outcomes of Analysis and Design Lab-I | |
| Sl. No. | Course Outcomes |
| C308.1 | To impart FEM software for the analysis of structural elements |
| C308.2 | Draw SFD and BMD for various kind of beam using Excel. |
| C308.3 | Prepare design spared sheet. |
| C308.4 | Design RCC components using excel |
| C308.5 | Plot graph for various problems using excel |

| Course Name: Analysis and Design Lab-I | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL58 | | | | | | | | | | | | | | | |
| POs & PSOs of Analysis and Design Lab-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C308.1 | 1 | 3 | 3 | 3 | 3 | | | | 2 | | 1 | 2 | | 3 | |
| C308.2 | 1 | 3 | 3 | 2 | 3 | | | | 2 | | | 2 | 1 | 2 | |
| C308.3 | 1 | 3 | 3 | | | | | | 1 | 1 | 2 | 2 | | 3 | |
| C308.4 | 2 | 3 | 3 | 2 | | | | | 1 | | | 2 | | 3 | |
| C308.5 | 2 | 3 | 1 | 2 | | | | | 2 | 1 | 1 | 2 | 1 | 2 | |
| C308 | 1.4 | 3 | 2.6 | 2.25 | 3 | | | | 1.6 | 2 | 1.3 | 2 | 1 | 2.6 | |

| Course Name: General Aptitude | |
|-------------------------------------|---|
| Course Code: 16CVH59 | |
| Course outcomes of General Aptitude | |
| Sl. No. | Course Outcomes |
| C309.1 | Solve and analyse different types of numerical / arithmetical problems. |
| C309.2 | Solve and analyse different data interpretation problems. |
| C309.3 | Acquire satisfactory competency in the use of numerical ability. |
| C309.4 | Understand the basic concepts of logical reasoning. |
| C309.5 | Compete in various competitive exams. |

| Course Name: General Aptitude | | | | | | | | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVH59 | | | | | | | | | | | | | | | |
| POs & PSOs of General Aptitude | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C309.1 | 3 | 2 | 1 | | | | | | | | | 1 | | 1 | |
| C309.2 | 3 | 2 | 1 | | | | | | | | | 1 | | 1 | |
| C309.3 | 3 | 2 | 1 | 1 | | | | | | | | 1 | | 1 | |
| C309.4 | 3 | 2 | 1 | 1 | | | | | | | | 1 | | 1 | |
| C309.5 | 3 | 2 | 1 | 1 | | | | | 1 | 1 | | 2 | | 1 | |
| C309 | 3 | 2 | 1 | 1 | | | | | 1 | 1 | | 1,2 | | 1 | |

| Course Name: Design of Steel Structures (IC) | |
|--|---|
| Course Code: 16CVI61 | |
| Course outcomes of Design of Steel Structures (IC) | |
| Sl. No. | Course Outcomes |
| C310.1 | Understand the concept of Limit State Design of steel structures. |
| C310.2 | Analyse and design steel structural beams subjected to plastic behaviour. |
| C310.3 | Capable of design various steel components using bolted and welded connections and also to develop a Cad drawing for the fabrication of different components of structures. |
| C310.4 | Apply Indian Standard code provisions for the design of tension and compression members. |
| C310.5 | Design flexural members and bases |

| Course Name: Design of Steel Structures (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI61 | | | | | | | | | | | | | | | |
| POs & PSOs of Design of Steel Structures (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C310.1 | 2 | 1 | 3 | | | | | | | | | | 1 | 3 | |
| C310.2 | 1 | 1 | 3 | 3 | | | | | | | | | | 3 | |
| C310.3 | 1 | 2 | 3 | | | | | | | | | | | 3 | |
| C310.4 | 1 | 2 | 3 | | | | | 2 | | | | | | 3 | |
| C310.5 | 1 | 2 | 3 | | | | | | | | | | | 3 | |
| C310 | 1.2 | 1 | 2.75 | 3 | 2 | | | 2 | | | | 2 | 1 | 2.75 | |

| | |
|---|---|
| Course Name: Geotechnical Engineering-I | |
| Course Code: 16CVT62 | |
| Course outcomes of Geotechnical Engineering-I | |
| Sl. No. | Course Outcomes |
| C311.1 | Solve three phase system problems. |
| C311.2 | Carry out index properties of soil and classification. |
| C311.3 | Solve any practical problems related to permeability and compaction. |
| C311.4 | Solve practical problems related to consolidation settlement and time rate of settlement. |
| C311.5 | Estimate the shear strength parameters in cohesive and cohesion less soils. |

| Course Name: Geotechnical Engineering-I | | | | | | | | | | | | | | | |
|--|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT62 | | | | | | | | | | | | | | | |
| POs & PSOs of Geotechnical Engineering-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C311.1 | 3 | 2 | 1 | | | | | | | | | | 1 | 3 | |
| C311.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | |
| C311.3 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C311.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C311.5 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | |
| C311 | 2.4 | 2.6 | 1 | 1.25 | | | | | | | | | 1 | 3 | 3 |

| Course Name: Environmental Engineering (IC) | |
|---|--|
| Course Code: 16CVI63 | |
| Course outcomes of Environmental Engineering (IC) | |
| Sl. No. | Course Outcomes |
| C312.1 | Recognize the importance of water to protect the water resources which is facing a continuous degradation in water quality. |
| C312.2 | Recognize that water supply and sanitation is an important professional and ethical responsibility of civil engineer. |
| C312.3 | Demonstrate an ability to recognize the type of unit operations and processes involved in water and wastewater treatment plants. |
| C312.4 | Demonstrate an ability to design individual unit operation in treatment of water and wastewater. |
| C312.5 | Demonstrate ability in monitoring and analysis of water and waste water quality parameters |

| Course Name: Environmental Engineering (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI63 | | | | | | | | | | | | | | | |
| POs & PSOs of Environmental Engineering (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C312.1 | 1 | | | | | 2 | 3 | | 1 | | | | 1 | 3 | 3 |
| C312.2 | 1 | | | | | 2 | 3 | 2 | | | | | 3 | | 2 |
| C312.3 | 1 | | 2 | | | 2 | 3 | | | | | | 3 | | 3 |
| C312.4 | 1 | | 3 | | | 2 | 2 | | | | | | 3 | 3 | 3 |
| C312.5 | 1 | | | | 2 | 1 | 3 | 2 | | | | | 1 | 2 | 3 |
| C312 | 1 | | 2.5 | | 2 | 1.8 | 2.8 | 2 | 1 | | | | 2.2 | 2.67 | 2.8 |

| Course Name: Advanced Transportation Engineering | |
|--|--|
| Course Code: 16CVT642 | |
| Course outcomes of Advanced Transportation Engineering | |
| Sl. No. | Course Outcomes |
| C313.1 | Introduction to Railway Engineering and its importance in transportation sector |
| C313.2 | Importance of Traction and Tractive resistance and Geometric Design in Railways |
| C313.3 | Importance of Airport Engineering and Basic Runway Design in Airport Engineering |
| C313.4 | Definition of Tunnel, Different types of tunnels and methods of tunnelling |
| C313.5 | To learn the importance of Harbour and dock construction. |

| Course Name: Advanced Transportation Engineering | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT642 | | | | | | | | | | | | | | | |
| POs & PSOs of Advanced Transportation Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C313.1 | 2 | 2 | | | 1 | 2 | | | | | | 2 | | 1 | 1 |
| C313.2 | 2 | 3 | 2 | | | | | | | | | 1 | 1 | 3 | 1 |
| C313.3 | 2 | 1 | | 2 | | | | | | | | | 2 | 1 | 1 |
| C313.4 | 1 | | 1 | 2 | | | | | | | | 2 | 1 | 3 | 1 |
| C313.5 | 2 | | | | | | | | | | | 1 | | 1 | 1 |
| C313 | 1.8 | 2 | 1.5 | 2 | 1 | 2 | | | | | | 1.5 | 2 | 1.8 | 1 |

| Course Name: Pavement Materials and Construction | |
|--|--|
| Course Code: 16CVT653 | |
| Course outcomes of Pavement Materials and Construction | |
| Sl. No. | Course Outcomes |
| C314.1 | Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes |
| C314.2 | Analyse flexible pavements and rigid pavements. |
| C314.3 | Understand the need of various equipment required for construction of highways. |
| C314.4 | Construction of flexible pavement and rigid pavement. |
| C314.5 | Prepare quality assurance and quality control plans in an attempt to construct better performing pavements |

| Course Name: Pavement Materials and Construction | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT653 | | | | | | | | | | | | | | | |
| POs & PSOs of Pavement Materials and Construction | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C314.1 | 3 | | | | | 1 | 2 | | | | | 1 | 1 | 2 | 1 |
| C314.2 | 2 | 3 | 2 | | | | | | | | | 2 | 2 | 3 | 1 |
| C314.3 | | 1 | | 2 | 3 | | | | | | | | 2 | 3 | 1 |
| C314.4 | 1 | | 3 | 3 | | | | | | | | | 2 | 3 | 1 |
| C314.5 | 1 | | | 2 | | 2 | 3 | | | | | 2 | 1 | 2 | 1 |
| C314 | 1.4 | 2 | 2.5 | 2.3 | 3 | 1.5 | 2.5 | | | | | 1.6 | 1.6 | 2.6 | 1 |

| Course Name: Lab View – Level 1 | |
|---------------------------------------|---|
| Course Code: 16HOE661 | |
| Course outcomes of Lab View – Level 1 | |
| Sl. No. | Course Outcomes |
| C315a.1 | Formulate basic aspects of the graphical programming using Lab View 2016 |
| C315a.2 | Develop Lab VIEW coding for a specific problem of data logging, measurement and presentation. |
| C315a.3 | Handle the error function and errors in the Lab VIEW coding. |
| C315a.4 | Develop coding for data handling and analysis on the acquired data. |
| C315a.5 | Design a state machine lab VIEW for an applied problem. |

| Course Name: Lab View – Level 1 | | | | | | | | | | | | | | | |
|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE661 | | | | | | | | | | | | | | | |
| POs & PSOs of Lab View – Level 1 | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315a.1 | 2 | 3 | 3 | 1 | 3 | | | 1 | 2 | | | 3 | 2 | 3 | 1 |
| C315a.2 | 2 | 3 | 3 | 3 | 3 | | | 1 | 2 | | | 2 | 3 | 3 | 1 |
| C315a.3 | 3 | 3 | 3 | 2 | 3 | | | 1 | 2 | 2 | | 2 | 2 | 3 | 1 |
| C315a.4 | 3 | 3 | 3 | 3 | 3 | | | 2 | 2 | 1 | | 2 | 3 | 3 | 1 |
| C315a.5 | 2 | 3 | 3 | 2 | 3 | | | 2 | 2 | 1 | | 2 | 3 | 3 | 1 |
| C315a | 2.4 | 3 | 3 | 2.2 | 3 | | | 1.4 | 2 | 1.3 | | 2.2 | 2.6 | 3 | 1 |

| | |
|---------------------------|--|
| Course Name: Sports | |
| Course Code: 16HOE666 | |
| Course outcomes of Sports | |
| Sl. No. | Course Outcomes |
| C315b.1 | Demonstrate adequate knowledge and competencies needed to be successful sports management professionals. |
| C315b.2 | Apply knowledge and skills learned throughout the curriculum in real world. |
| C315b.3 | Apply critical thinking and reasoning skills as sports professionals. |
| C315b.4 | Communicate, orally and in writing, as a sports professional within various sports. |
| C315b.5 | Analyse situations and apply the principles of appropriate leadership skills and behaviours related to sports and sport leadership responsibilities. |

| Course Name: Sports | | | | | | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE666 | | | | | | | | | | | | | | | |
| POs & PSOs of Sports | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315b.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315b.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315b.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315b.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315b.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315b | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 16HOE667 | |
| Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C315C.1 | Learn the use of different online tools. |
| C315C.2 | Analyse the problems. |
| C315C.3 | Communicate effectively on engineering activities. |
| C315C.4 | Design and develop solutions for complex problems. |
| C315C.5 | Apply the knowledge of engineering fundamentals. |

| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
|--|-----|-----|------|------|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE667 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315C.1 | 2 | 1 | | 2 | 3 | | | | | | | | 1 | 3 | 1 |
| C315C.2 | 1 | 3 | 2 | | 1 | | | | | | | | 1 | 3 | 1 |
| C315C.3 | 2 | 1 | 1 | | | | | | | 3 | | | 1 | 3 | 1 |
| C315C.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | 1 |
| C315C.5 | 3 | 2 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C315C | 1.8 | 1.8 | 1.75 | 1.67 | 1.33 | | | | | 3 | | | 1 | 3 | 1 |

| | |
|--|---|
| Course Name: Basics of Photography | |
| Course Code: 16HOE668 | |
| Course outcomes of Basics of Photography | |
| Sl. No. | Course Outcomes |
| C315d.1 | Use a variety of brainstorming techniques to generate novel ideas of value to solve problems. |
| C315d.2 | Master of one or more media to complete the technical and formal challenges pertinent to a body of original work. |
| C315d.3 | Communicate the content and context of their work visually, orally and in writing. |
| C315d.4 | Develop behaviours such as curiosity, initiative, and persistence that will help them engage with the world in productive ways. |
| C315d.5 | Work independently or collaboratively to achieve stated goals. |

| Course Name: Basics of Photography | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE668 | | | | | | | | | | | | | | | |
| POs & PSOs of Basics of Photography | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315d.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315d.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315d.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315d.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315d.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315d | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| | |
|-----------------------|-----------------|
| Course Name: | |
| Course Code: 16HOE669 | |
| Course outcomes of | |
| Sl. No. | Course Outcomes |
| C315e.1 | |
| C315e.2 | |
| C315e.3 | |
| C315e.4 | |
| C315e.5 | |

| Course Name: | | | | | | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE669 | | | | | | | | | | | | | | | |
| POs & PSO's of | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315e.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315e.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315e.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315e.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315e.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315e | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Detailing of Structural Elements Lab | |
|---|--|
| Course Code: 16CVL67 | |
| Course outcomes of Detailing of Structural Elements Lab | |
| Sl. No. | Course Outcomes |
| C316.1 | Execute computer aided drawing for detailing different structural components |
| C316.2 | Develop working drawing for structural fabrication based on design. |
| C316.3 | Set up a drawing of different components which are useful for the industries |
| C316.4 | Interpret and analyse views of a drawing |
| C316.5 | Design of structural components as per IS standards |

| Course Name: Detailing of Structural Elements Lab | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL67 | | | | | | | | | | | | | | | |
| POs & PSOs of Detailing of Structural Elements Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C316.1 | 1 | | 3 | 2 | 2 | | | | | | | | 2 | 3 | |
| C316.2 | | 2 | 3 | 1 | 2 | | | | | | | | 2 | 3 | |
| C316.3 | | 2 | 3 | 1 | 1 | | | | | | | | 1 | 3 | |
| C316.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | |
| C316.5 | | 2 | 3 | 1 | 1 | | | 2 | | | | | 1 | 3 | |
| C316 | 1 | 2 | 3 | 1.4 | 1.4 | | | 2 | | | | | 1.4 | 3 | |

| Course Name: Extensive Survey Camp | |
|--|---|
| Course Code: 16CVL68 | |
| Course outcomes of Extensive Survey Camp | |
| Sl. No. | Course Outcomes |
| C317.1 | Understand of the principles and operation of the Global Positioning System for locating salient features by Total Station. |
| C317.2 | Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork for civil engineering projects. |
| C317.3 | Apply the need for licensed surveyors to establish positioning information for property and structures. |
| C317.4 | Prepare layout plans as per the specifications of the local bodies. |
| C317.5 | Develop communication skills and team work in any project. |

| Course Name: Extensive Survey Camp | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL68 | | | | | | | | | | | | | | | |
| POs & PSOs of Extensive Survey Camp | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C317.1 | 3 | 2 | 2 | 1 | 2 | | | | 2 | 2 | | 1 | 3 | 3 | 2 |
| C317.2 | 2 | 2 | 1 | | 1 | | | | 2 | 1 | | 1 | 2 | 3 | 1 |
| C317.3 | 1 | | 2 | | | 2 | | 1 | | | | 1 | 1 | 3 | 1 |
| C317.4 | 2 | 1 | 2 | | 2 | 1 | | 1 | | | | 1 | 3 | 3 | 1 |
| C317.5 | 2 | 1 | | | | | | | 2 | 3 | | | 2 | 2 | 2 |
| C317 | 2 | 1.2 | 1.4 | 1 | 1.66 | 1.5 | | 1 | 2 | 2 | | 1 | 2.2 | 2.8 | 1.4 |

| | |
|--|--|
| Course Name: Technical Aptitude and GD | |
| Course Code: 16CVH69 | |
| Course outcomes of Technical Aptitude and GD | |
| Sl. No. | Course Outcomes |
| C318.1 | Solve and analyse different types of technical problems. |
| C318.2 | Solve and analyse different data interpretation problems. |
| C318.3 | Acquire satisfactory competency in solving technical problems. |
| C318.4 | Use the communication skills in further activities. |
| C318.5 | Apply the knowledge of group discussion in further placement activities. |

| Course Name: Technical Aptitude and GD | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVH69 | | | | | | | | | | | | | | | |
| POs & PSOs of Technical Aptitude and GD | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C318.1 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.2 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.3 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.4 | | | | | | | | | 2 | 3 | | 1 | | | |
| C318.5 | | | | | | | | | 2 | 3 | | 1 | | | |
| C318 | 2 | 3 | | | | | | | 2 | 3 | | 1 | 2 | 2 | 2 |

| Course Name: Geotechnical Engineering-II (IC) | |
|---|---|
| Course Code: 16CVI71 | |
| Course outcomes of Geotechnical Engineering-II (IC) | |
| Sl. No. | Course Outcomes |
| C401.1 | Analyse any field situation with the knowledge gained. |
| C401.2 | Estimate the stresses that will develop in the soil. |
| C401.3 | Solve any practical problems related to soil stresses estimation, and seepage including flow net diagram. |
| C401.4 | Solve the lateral pressure by different methods. |
| C401.5 | Carry out stability analysis and settlement calculation & solve the SBC of the soil. |

| Course Name: Geotechnical Engineering-II (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI71 | | | | | | | | | | | | | | | |
| POs & PSOs of Geotechnical Engineering-II (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C401.1 | 3 | 2 | 1 | | | | | | | | | | 1 | 3 | 1 |
| C401.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C401.3 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C401.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C401.5 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C401 | 2.4 | 2.6 | 1 | 1.25 | | | | | | | | | 1 | 3 | 1.8 |

| | |
|--|--|
| Course Name: Estimation and Valuation (IC) | |
| Course Code: 16CVI72 | |
| Course outcomes of Estimation and Valuation (IC) | |
| Sl. No. | Course Outcomes |
| C402.1 | Explain types of estimate and duties of an Estimator |
| C402.2 | Undertake rate analysis of civil engineering works. |
| C402.3 | Determine the rates of various items of civil works. |
| C402.4 | Calculate estimated cost of civil construction projects. |
| C402.5 | Evaluate the actual value of any property. |

| Course Name: Estimation and Valuation (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----|-----|-----|------|-----|------|------|------|------|------|------|
| Course Code: 16CVI72 | | | | | | | | | | | | | | | |
| POs & PSOs of Estimation and Valuation (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C402.1 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402.2 | 2 | 2 | 1 | | | | 1 | 2 | | | 2 | 1 | 3 | 3 | 2 |
| C402.3 | 2 | 2 | 1 | 1 | | | | | | | 1 | 1 | 3 | 3 | 1 |
| C402.4 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402.5 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402 | 2.6 | 2 | 1.6 | 1.75 | | 2 | 1 | 1.25 | | | 1.8 | 1.6 | 3 | 3 | 1.8 |

| | |
|---|---|
| Course Name: Pre-Stressed Concrete Structures | |
| Course Code: 16CVT732 | |
| Course outcomes of Pre-Stressed Concrete Structures | |
| Sl. No. | Course Outcomes |
| C403.1 | Apply the knowledge of pre stressing, devices and different tensioning systems. |
| C403.2 | Analyse the stresses due to different loads. |
| C403.3 | Calculate losses in PSC members. |
| C403.4 | Determine the limit state of PSC beams in flexure and shear. |
| C403.5 | Design end block and determine anchorage zone stress in members. |

| Course Name: Pre-Stressed Concrete Structures | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT732 | | | | | | | | | | | | | | | |
| POs & PSOs of Pre-Stressed Concrete Structures | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C403.1 | 3 | 3 | 3 | 3 | 2 | | | | | | | 1 | 3 | 3 | 1 |
| C403.2 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403.3 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403.4 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403.5 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403 | 3 | 3 | 3 | 3 | 2 | | | | | | | 1 | 3 | 3 | 1 |

| | |
|---|---|
| Course Name: Fire safety and management | |
| Course Code: 16CVT741 | |
| Course outcomes of Fire safety and management | |
| Sl. No. | Course Outcomes |
| C404a.1 | Make familiar about basic concepts of fire and explosion science. |
| C404a.2 | Know the different source of ignition and their prevention techniques. |
| C404a.3 | Understand the operation of various types of fire fighting equipment's. |
| C404a.4 | Understand the causes and prevention of explosion. |
| C404a.5 | Equip to effectively employ explosion protection techniques and their significances to suit the industrial requirement. |

| Course Name: Fire safety and management | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT741 | | | | | | | | | | | | | | | |
| POs & PSOs of Fire safety and management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C404a.1 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.2 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.3 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.4 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.5 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |

| Course Name: Industrial Waste Water treatment | |
|---|--|
| Course Code: 16CVT743 | |
| Course outcomes of Industrial Waste Water treatment | |
| Sl. No. | Course Outcomes |
| C404b.1 | Understand the effect of parameters of pollution on receiving streams. |
| C404b.2 | Advise the regulating authority about the possible danger specific industries. |
| C404b.3 | Develop planning skill in designing water pollution control systems in industries. |
| C404b.4 | Differentiate red category industries from green category industries. |
| C404b.5 | Characterize the different effluents from specific industries. |

| Course Name: Industrial Waste Water treatment | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVT743 | | | | | | | | | | | | | | | |
| POs & PSOs of Industrial Waste Water treatment | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C404b.1 | 1 | | | | | 3 | 2 | 1 | | | | 1 | 1 | 1 | 3 |
| C404b.2 | 2 | 3 | | | | 1 | 1 | 2 | | | | | 1 | 1 | 3 |
| C404b.3 | 2 | 1 | | | | 1 | 3 | | | | | | 2 | 1 | 3 |
| C404b.4 | 2 | 3 | | | 3 | 1 | 1 | | | | | | 1 | 1 | 3 |
| C404b.5 | 2 | 1 | 3 | | | 2 | 1 | | | | | | 1 | 1 | 3 |
| C404b | 1.8 | 2 | 3 | | 3 | 1.6 | 1.6 | 1.5 | | | | 1 | 1.2 | 1 | 3 |

| | |
|---|---|
| Course Name: Natural Disaster Mitigation and Management | |
| Course Code: 16HOE753 | |
| Course outcomes of Natural Disaster Mitigation and Management | |
| Sl. No. | Course Outcomes |
| C405.1 | Learn about the types of natural and environmental disaster and its causes. |
| C405.2 | Learn about organizational and administrative strategies for managing disasters. |
| C405.3 | Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation. |
| C405.4 | Apply the key roles of capacity building to face disaster among government bodies, institutions, NGOS. |
| C405.5 | Learn methodologies of disaster risk assessment with the help of latest tools like GPS, GIS AND Remote sensing. |

| Course Name: Natural Disaster Mitigation and Management | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE753 | | | | | | | | | | | | | | | |
| POs & PSOs of Natural Disaster Mitigation and Management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C405.1 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.2 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.3 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.4 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.5 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |

| Course Name: Occupational Safety and Health Administration | |
|--|--|
| Course Code: 16HOE762 | |
| Course outcomes of Occupational Safety and Health Administration | |
| Sl. No. | Course Outcomes |
| C406a.1 | Develop the ability to know the occupational health and safety. |
| C406a.2 | Know the socio - economic aspects of occupational health and safety. |
| C406a.3 | Demonstrate purpose of health screening measures. |
| C406a.4 | Know the legal provisions on occupational health and safety. |
| C406a.5 | Participate in research and occupational health. |

| Course Name: Occupational Safety and Health Administration | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE762 | | | | | | | | | | | | | | | |
| POs & PSOs of Occupational Safety and Health Administration | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C406a.1 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.2 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.3 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.4 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.5 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 16HOE764 | |
| Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C406b.1 | Creating basic drawings by using REVIT |
| C406b.2 | Manipulating objects in the drawing. |
| C406b.3 | Drawing organization and inquiry commands. |
| C406b.4 | Hatching objects |
| C406b.5 | Working with reusable contents. |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16HOE764 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C406b.1 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.2 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.3 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.4 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.5 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |

| | |
|---|--|
| Course Name: Project Management Lab | |
| Course Code: 16CVL77 | |
| Course outcomes of Project Management Lab | |
| Sl. No. | Course Outcomes |
| C407.1 | Preparing project plans, schedule of construction. |
| C407.2 | Understanding the construction management software. |
| C407.3 | Understanding construction network and time estimates. |
| C407.4 | Understanding the concepts of construction project management. |
| C407.5 | Creating the construction project reports. |

| Course Name: Project Management Lab | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL77 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Management Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C407.1 | 3 | 3 | | | 3 | | | | | | 3 | | 1 | 2 | 1 |
| C407.2 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 2 | 1 |
| C407.3 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 2 | 1 |
| C407.4 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 3 | 1 |
| C407.5 | 3 | 3 | | | 3 | | | | | | 3 | | 1 | 2 | 1 |
| C407 | 3 | 3 | | | 3 | | | | | | 3 | | 1.6 | 2.2 | 1 |

| Course Name: Analysis and Design Lab-II | |
|---|---|
| Course Code: 16CVL78 | |
| Course outcomes of Analysis and Design Lab-II | |
| Sl. No. | Course Outcomes |
| C408.1 | Design and Analysis of Different components of Structures |
| C408.2 | Apply Spreadsheet calculations to Civil Engineering |
| C408.3 | Analyse water resource networks |
| C408.4 | Apply computing skills to geotechnical engineering |
| C408.5 | Make use of various software package |

| Course Name: Analysis and Design Lab-II | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVL78 | | | | | | | | | | | | | | | |
| POs & PSOs of Analysis and Design Lab-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C408.1 | 1 | 3 | 3 | 1 | 3 | | | | | | | 1 | 1 | 3 | 1 |
| C408.2 | 1 | 2 | | 1 | 2 | | | | | | | | 1 | 3 | 1 |
| C408.3 | 2 | 2 | | | 1 | | | | | | | | 1 | 2 | 1 |
| C408.4 | 1 | 2 | | | | | | | | | | | 1 | 2 | 1 |
| C408.5 | 2 | 1 | | | 3 | | | | | | | 1 | 2 | 2 | 2 |
| C408 | 1.4 | 2 | 3 | 1 | 2.25 | | | | | | | 1 | 1.2 | 2.4 | 1.2 |

| | |
|------------------------------------|---|
| Course Name: Project Phase-I | |
| Course Code: 16CVP79 | |
| Course outcomes of Project Phase-I | |
| Sl. No. | Course Outcomes |
| C409.1 | Engage more in the learning process |
| C409.2 | Think outside the box by thinking differently about the problem |
| C409.3 | Make deep connections between ideas |
| C409.4 | Make them problem-solvers |
| C409.5 | Learn project management |

| Course Name: Project Phase-I | | | | | | | | | | | | | | | |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVP79 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C409.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C409.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C409.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C409.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C409.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C409 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| | |
|-------------------------------------|---|
| Course Name: Project Phase-II | |
| Course Code: 16CVP81 | |
| Course outcomes of Project Phase-II | |
| Sl. No. | Course Outcomes |
| C410.1 | Engage more in the learning process |
| C410.2 | Think outside the box by thinking differently about the problem |
| C410.3 | Make deep connections between ideas |
| C410.4 | Make them problem-solvers |
| C410.5 | Learn project management |

| Course Name: Project Phase-II | | | | | | | | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVP81 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C410.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C410.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C410.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C410.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C410.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C410 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| | |
|--------------------------------------|---|
| Course Name: Project Phase-III | |
| Course Code: 16CVP82 | |
| Course outcomes of Project Phase-III | |
| Sl. No. | Course Outcomes |
| C411.1 | Engage more in the learning process |
| C411.2 | Think outside the box by thinking differently about the problem |
| C411.3 | Make deep connections between ideas |
| C411.4 | Make them problem-solvers |
| C411.5 | Learn project management |

| Course Name: Project Phase-III | | | | | | | | | | | | | | | |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVP82 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-III | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C411.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C411.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C411.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C411.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C411.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C411 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| | |
|--|---|
| Course Name: Evaluation and Viva voce (External) | |
| Course Code: 16CVP83 | |
| Course outcomes of Evaluation and Viva voce (External) | |
| Sl. No. | Course Outcomes |
| C412.1 | Engage more in the learning process |
| C412.2 | Think outside the box by thinking differently about the problem |
| C412.3 | Make deep connections between ideas |
| C412.4 | Make them problem-solvers |
| C412.5 | Learn project management |

| Course Name: Evaluation and Viva voce (External) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVP83 | | | | | | | | | | | | | | | |
| POs & PSOs of Evaluation and Viva voce (External) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C412.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C412.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C412.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C412.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C412.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C412 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

Nagarjuna College of Engineering and Technology

Department of Civil Engineering - 2017 Scheme

| Course Name: Engineering Mathematics-III (IC) | |
|---|--|
| Course Code: 17CVM31 | |
| Course outcomes of Engineering Mathematics-III (IC) | |
| Sl. No. | Course Outcomes |
| C201.1 | Form a partial differential equations and their solutions. |
| C201.2 | Expressing the given functions as infinite series and their solutions. |
| C201.3 | Solve the functional and variations problems. |
| C201.4 | Find approximated solutions by numerical methods. |
| C201.5 | Use the SCILAB to solve the various types engineering problems. |

| Course Name: Engineering Mathematics-III (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVM31 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Mathematics-III (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C201.1 | 3 | 3 | 2 | 3 | 2 | | | 2 | 2 | | | 1 | 1 | 3 | 2 |
| C201.2 | 2 | 3 | 2 | 2 | 2 | | | 1 | 1 | | | 1 | 1 | 2 | 3 |
| C201.3 | 2 | 3 | 2 | 3 | 3 | | | 1 | 1 | | | 1 | 1 | 2 | 3 |
| C201.4 | 2 | 3 | 2 | 2 | 3 | | | 1 | 1 | | | 1 | 1 | 3 | 3 |
| C201.5 | 2 | 2 | 3 | 2 | 3 | | | 1 | 1 | | | 1 | 1 | 3 | 2 |
| C201 | 2.2 | 2.8 | 2.2 | 2.4 | 2.6 | | | 1.2 | 1.2 | | | 1 | 1 | 2.6 | 2.6 |

| Course Name: Building Materials and Concrete Technology | |
|---|--|
| Course Code:17CVT32 | |
| Course outcomes of Building Materials and Concrete Technology | |
| Sl. No. | Course Outcomes |
| C202.1 | Recognize the materials used in construction. |
| C202.2 | Describe the physical and mechanical properties of variety of materials. |
| C202.3 | Identify the functional components of a building. |
| C202.4 | Describe the construction process of various components of a building. |
| C202.5 | Explain the fundamental principles and procedures in repairing concrete. |

| Course Name: Building Materials and Concrete Technology | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT32 | | | | | | | | | | | | | | | |
| POs & PSOs of Building Materials and Concrete Technology | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C202.1 | 3 | 2 | | | | 1 | 1 | | | | | 1 | 3 | 3 | 1 |
| C202.2 | 2 | 1 | 2 | 3 | | 1 | | | | | | | 3 | 3 | 1 |
| C202.3 | 2 | 3 | | 1 | | | 1 | | | | | | 3 | 3 | 1 |
| C202.4 | 3 | 2 | 1 | 2 | | | | | | | | 1 | 3 | 3 | 1 |
| C202.5 | 2 | 2 | 3 | | | | 1 | | | | | 1 | 3 | 3 | 1 |
| C202 | 2.4 | 2 | 2 | 2 | | 1 | 1 | | | | | 1 | 3 | 3 | 1 |

| | |
|--|--|
| Course Name: Strength of Materials | |
| Course Code:17CVT33 | |
| Course outcomes of Strength of Materials | |
| Sl. No. | Course Outcomes |
| C203.1 | Describe the fundamental concepts of stress and strain under elastic limits. |
| C203.2 | Analyse SFD and BMD for beams. |
| C203.3 | Determine the buckling loads of a long columns. |
| C203.4 | Determine deflection in beams under different loading conditions. |
| C203.5 | Analyse the bending stress and shear stress in the beams. |

| Course Name: Strength of Materials | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT33 | | | | | | | | | | | | | | | |
| POs & PSOs of Strength of Materials | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C203.1 | 1 | 3 | 2 | | | | | | | | | | 2 | 3 | 1 |
| C203.2 | 2 | 2 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C203.3 | 1 | 3 | 2 | 2 | | | | | | | | | 3 | 3 | 1 |
| C203.4 | 2 | 3 | 2 | 1 | | | | | | | | | 3 | 3 | 1 |
| C203.5 | 2 | 3 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C203 | 1.6 | 2.8 | 1.6 | 2.25 | | | | | | | | | 2.8 | 3 | 1 |

| Course Name: Surveying | |
|------------------------------|---|
| Course Code: 17CVT34 | |
| Course outcomes of Surveying | |
| Sl. No. | Course Outcomes |
| C204.1 | Identify the basics involved in different types of surveying like tape, compass, levelling and theodolite/ total station. |
| C204.2 | Recognize the skills in performing measurement of distance, angles and levelling. |
| C204.3 | Develop skills for estimating the strengths between given points, area of a given plot and earth work involved in cutting and fillings. |
| C204.4 | Develop skill to carry out tachometry, geodetic surveying wherever situations demands and curve setting. |
| C204.5 | Apply error adjustment to the recorded reading to get an accurate surveying output. |

| Course Name: Surveying | | | | | | | | | | | | | | | |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT34 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C204.1 | 3 | 3 | 2 | | 3 | 1 | | | 2 | 3 | | 1 | 3 | 3 | 1 |
| C204.2 | 3 | 3 | 1 | 1 | | | | | 2 | 2 | | 1 | 3 | 3 | 1 |
| C204.3 | 3 | 3 | 2 | 1 | 3 | | | | 2 | 2 | | 2 | 3 | 3 | 1 |
| C204.4 | 3 | 3 | 2 | 2 | | | | | 2 | 3 | | 2 | 3 | 3 | 1 |
| C204.5 | 3 | 2 | 1 | | | | | | 1 | 1 | | 1 | 3 | 1 | 1 |
| C204 | 3 | 2.8 | 1.6 | 1.3 | 3 | 1 | | | 1.8 | 2.2 | | 1.4 | 3 | 2.6 | 1 |

| Course Name: Engineering Geology (IC) | |
|---|---|
| Course Code: 17CVI35 | |
| Course outcomes of Engineering Geology (IC) | |
| Sl. No. | Course Outcomes |
| C205.1 | Describe earth and its internal structure to identify natural resources useful for construction |
| C205.2 | Recognize good building materials and their properties |
| C205.3 | Explain earth processes and its effect on engineering construction |
| C205.4 | Effect of geological structure on engineering structure |
| C205.5 | Identify the formation, distribution and conservation of water resources |

| Course Name: Engineering Geology (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVI35 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Geology (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C205.1 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C205.2 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 1 |
| C205.3 | 3 | 2 | | | | 1 | | | | | | | 1 | 3 | 1 |
| C205.4 | 2 | 3 | 1 | | | | | | | | | | 2 | 3 | 1 |
| C205.5 | 3 | 2 | | 1 | | | 1 | | | | | | 1 | 3 | 3 |
| C205 | 2.6 | 2.4 | 1 | 1.3 | | 1 | 1 | | | | | | 1.2 | 3 | 1.4 |

| Course Name: Rural Water Supply and Sanitation | |
|--|---|
| Course Code: 17CVT362 | |
| Course outcomes of Rural Water Supply and Sanitation | |
| Sl. No. | Course Outcomes |
| C206a.1 | Identify and select water supply systems in rural areas. |
| C206a.2 | Distinguish between urban and rural water supply systems. |
| C206a.3 | Categorize the different types of water borne, communicable diseases and apply the principles of rainwater harvesting. |
| C206a.4 | Explain overall management of rural water supply and other components like milk sanitation. |
| C206a.5 | Examine overall management of solid waste collection, disposal and other components like composting of waste to energy. |

| Course Name: Rural Water Supply and Sanitation | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT362 | | | | | | | | | | | | | | | |
| POs & PSOs of Rural Water Supply and Sanitation | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C206a.1 | 1 | 3 | | | | 2 | | | 1 | | | | 1 | 3 | 3 |
| C206a.2 | 2 | 3 | | | | 1 | | | | | 1 | | 1 | 3 | 3 |
| C206a.3 | 2 | 2 | | | | 3 | 2 | 1 | | | | | 2 | 3 | 3 |
| C206a.4 | | | | | | 1 | 2 | | | 1 | 3 | | 2 | 3 | 3 |
| C206a.5 | 1 | | | | | 2 | 3 | | | | 3 | | 2 | 3 | 3 |
| C206a | 1.5 | 2.6 | | | | 1.8 | 2.3 | 1 | 1 | 1 | 2.3 | | 1.6 | 3 | 3 |

| Course Name: Solid Waste Management | |
|---|---|
| Course Code: 17CVT363 | |
| Course outcomes of Solid Waste Management | |
| Sl. No. | Course Outcomes |
| C206b.1 | Explain the components of solid waste management and the laws governing it. |
| C206b.2 | Describe the solid waste collection systems, route optimization techniques and processing of solid waste. |
| C206b.3 | Design, operation, maintenance of landfills and composting units. |
| C206b.4 | Analyse the different sanitary landfilling methods and suggest suitable methods for landfilling. |
| C206b.5 | Discuss the importance and techniques of all major and minor methods of disposal considering plastic and bio - medical waste. |

| Course Name: Solid Waste Management | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT363 | | | | | | | | | | | | | | | |
| POs & PSOs of Solid Waste Management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C206b.1 | | | | | | 3 | 2 | 2 | 1 | | | | 3 | 1 | 3 |
| C206b.2 | | 3 | 2 | | | 1 | 1 | | | | | | 2 | 1 | 3 |
| C206b.3 | 1 | 2 | 3 | | | 1 | 1 | | | | | 1 | 3 | 3 | 3 |
| C206b.4 | 1 | 2 | 2 | 3 | | 2 | 2 | | | | | 1 | 3 | 2 | 3 |
| C206b.5 | | | | 1 | | 2 | 3 | 1 | | | | | 3 | 1 | 3 |
| C206b | 1 | 2.3 | 2.3 | 2 | | 1.8 | 1.8 | 1.5 | 1 | | | 1 | 2.8 | 1.6 | 3 |

| | |
|--|--|
| Course Name: Basic Material Testing Laboratory | |
| Course Code: 17CVL37 | |
| Course outcomes of Basic Material Testing Laboratory | |
| Sl. No. | Course Outcomes |
| C207.1 | Identification and classification of aggregates. |
| C207.2 | Conduct compression, tension, bending and shear tests in UTM to determine strength. |
| C207.3 | Perform torsion, hardness, and impact tests to evaluate material properties. |
| C207.4 | Identify and solve engineering problems of structural elements subjected to flexure. |
| C207.5 | Decide the techniques, skills and modern engineering tools necessary for engineering applications. |

| Course Name: Basic Material Testing Laboratory | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL37 | | | | | | | | | | | | | | | |
| POs & PSOs of Basic Material Testing Laboratory | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C207.1 | 3 | 1 | | 2 | | | | | | | | | 3 | 3 | 1 |
| C207.2 | 1 | 2 | | 3 | | | | | | | | | 2 | 3 | 1 |
| C207.3 | 1 | 2 | | 3 | | | | | | | | | 2 | 3 | 1 |
| C207.4 | 2 | 3 | 1 | 1 | | | | | | | | | 2 | 3 | 1 |
| C207.5 | 2 | | 1 | | 3 | | | | | | | | 3 | 3 | 1 |
| C207 | 1.8 | 2 | 1 | 2.25 | 3 | | | | | | | | 2.4 | 3 | 1 |

| Course Name: Surveying Practice-I | |
|---|---|
| Course Code: 17CVL38 | |
| Course outcomes of Surveying Practice-I | |
| Sl. No. | Course Outcomes |
| C208.1 | Explain principles involved in different instruments used in surveying. |
| C208.2 | Apply the concepts of basic mathematics and it's in surveying. |
| C208.3 | Develop skill to measure vertical distances using dumpy level. |
| C208.4 | Determine ground profile by levelling. |
| C208.5 | Illustrate the knowledge of using minor instruments. |

| Course Name: Surveying Practice-I | | | | | | | | | | | | | | | |
|------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL38 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying Practice-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C208.1 | 3 | 3 | 2 | 2 | 3 | | | | 3 | 3 | | 3 | 3 | 3 | 2 |
| C208.2 | 3 | 3 | 1 | 1 | | | | | 2 | 1 | | 2 | 3 | 3 | 1 |
| C208.3 | 3 | 3 | 3 | 2 | 1 | | | | 3 | 2 | | 1 | 3 | 3 | 2 |
| C208.4 | 3 | 3 | 2 | 1 | | | | | 3 | 3 | | 3 | 3 | 3 | 3 |
| C208.5 | 2 | 1 | | | | | | | 1 | 1 | | 1 | 3 | 1 | 1 |
| C208 | 2.8 | 2.6 | 2 | 1.5 | 2 | | | | 2.4 | 2 | | 2 | 3 | 2.6 | 1.8 |

| | |
|---|--|
| Course Name: Integrated Rural Development - Part 1 | |
| Course Code: 17CVH39 | |
| Course outcomes Integrated Rural Development - Part 1 | |
| Sl. No. | Course Outcomes |
| C209.1 | Develop the ability to interact and communicate with different sections of society, thus improving their communication skills. |
| C209.2 | Understand the existing problems and needs of a village, thus developing an awareness of the challenges facing in villages |
| C209.3 | Conceptualize, plan, and realize measures to address these problems, thus improving their practical problem - solving and leadership skills. |
| C209.4 | Make an impact to rural section of society, thus building their self - confidence. |
| C209.5 | Generate reports for the social impacts. |

| Course Name: Integrated Rural Development - Part 1 | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVH39 | | | | | | | | | | | | | | | |
| POs & PSOs of Integrated Rural Development - Part 1 | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C209.1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| C209.2 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C209.3 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| C209.4 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C209.5 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| C209 | 1.4 | 2.2 | 2.8 | 2.8 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.4 | 2.2 | 3 | 3 | 3 |

| Course Name: Engineering Mathematics-IV (IC) | |
|--|---|
| Course Code: 17CVM41 | |
| Course outcomes of Engineering Mathematics-IV (IC) | |
| Sl. No. | Course Outcomes |
| C210.1 | Determine the differentiation, Integration using numerical methods. |
| C210.2 | Solve differential equations using numerical methods. |
| C210.3 | Find the differentiation and Integrals of complex functions. |
| C210.4 | Find the probability using different distributions and analysis by using samplings. |
| C210.5 | Use the statistical software's. |

| Course Name: Engineering Mathematics-IV (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVM41 | | | | | | | | | | | | | | | |
| POs & PSOs of Engineering Mathematics-IV (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C210.1 | 1 | 2 | 1 | 3 | 3 | | | 2 | 3 | | | 2 | 1 | 2 | 2 |
| C210.2 | 2 | 2 | 2 | 3 | 3 | | | 2 | 2 | | | 2 | 1 | 2 | 3 |
| C210.3 | 2 | 2 | 1 | 3 | 3 | | | 2 | 1 | | | 2 | 1 | 3 | 2 |
| C210.4 | 2 | 2 | 1 | 3 | 3 | | | 1 | 2 | | | 2 | 1 | 2 | 1 |
| C210.5 | 1 | 2 | 1 | 2 | 3 | | | 2 | 2 | | | 2 | 1 | 2 | 2 |
| C210 | 1.6 | 2 | 1.2 | 2.8 | 3 | | | 1.8 | 2 | | | 2 | 1 | 2.2 | 2 |

| Course Name: Fluid Mechanics | |
|------------------------------------|--|
| Course Code: 17CVT42 | |
| Course outcomes of Fluid Mechanics | |
| Sl. No. | Course Outcomes |
| C211.1 | Describe the types of fluid and properties of fluids, fluid pressure measurements. |
| C211.2 | Identify the forces acting on a fluid motion and the relation between pressure and velocity in a flow. |
| C211.3 | Analyse the flow mechanism in pipes along with various losses with simple design of pipes. |
| C211.4 | Distinguish between the concept of flow in open channels for uniform flow and non-uniform flow. |
| C211.5 | Identify the pump required for different purposes and classify the turbines. |

| Course Name: Fluid Mechanics | | | | | | | | | | | | | | | |
|-------------------------------|-----|-----|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT42 | | | | | | | | | | | | | | | |
| POs & PSOs of Fluid Mechanics | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C211.1 | 3 | 2 | | 1 | | | | | | | | | 2 | 3 | 3 |
| C211.2 | 2 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 3 |
| C211.3 | 1 | 2 | 3 | 3 | | | | | | | | | 1 | 3 | 3 |
| C211.4 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C211.5 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C211 | 2 | 2.6 | 1.75 | 1.6 | | | | | | | | | 1.4 | 3 | 3 |

| Course Name: Structural Analysis-I | |
|--|---|
| Course Code: 17CVT43 | |
| Course outcomes of Structural Analysis-I | |
| Sl. No. | Course Outcomes |
| C212.1 | Identify different structural systems. |
| C212.2 | Analyse the trusses by different methods. |
| C212.3 | Determine forces and moments in arches and cables under different loading conditions. |
| C212.4 | Compute the deflection of structural elements by different methods. |
| C212.5 | Determine support moments for beams under different support conditions. |

| Course Name: Structural Analysis-I | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT43 | | | | | | | | | | | | | | | |
| POs & PSOs of Structural Analysis-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C212.1 | 2 | 3 | | 1 | | | | | | | | | 3 | 3 | 1 |
| C212.2 | 1 | 2 | 1 | 3 | | | | | | | | | 3 | 3 | 1 |
| C212.3 | 1 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C212.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 1 |
| C212.5 | 2 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C212 | 1.6 | 2.8 | 1.5 | 1.6 | | | | | | | | | 2.2 | 3 | 1 |

| Course Name: Building Planning and Drawing (IC) | |
|---|---|
| Course Code: 17CVI44 | |
| Course outcomes of Building Planning and Drawing (IC) | |
| Sl. No. | Course Outcomes |
| C213.1 | Illustrate the knowledge of bonds in brick masonry. |
| C213.2 | Recognize principles of planning using bylaws for building. |
| C213.3 | Develop plan for public health centre, school building and college canteen. |
| C213.4 | Draw plan, elevation and section for various residential buildings. |
| C213.5 | Illustrate the knowledge of electrical, water supply and sanitary services for residential buildings. |

| Course Name: Building Planning and Drawing (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVI44 | | | | | | | | | | | | | | | |
| POs & PSOs of Building Planning and Drawing (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C213.1 | 3 | 1 | | | | | | | | | | 1 | 1 | 3 | 1 |
| C213.2 | 3 | 1 | 2 | | | 2 | | 2 | | | | 2 | 3 | 2 | 1 |
| C213.3 | 2 | 2 | 2 | | 3 | 2 | | 2 | 1 | | | 1 | 3 | 2 | 1 |
| C213.4 | 3 | 2 | 2 | 2 | 3 | 1 | | 1 | | | | 2 | 3 | 2 | 1 |
| C213.5 | 2 | 1 | 2 | 1 | 3 | 1 | | | | | | 2 | 1 | 2 | 1 |
| C213 | 2.6 | 1.4 | 2 | 1.5 | 3 | 1.5 | | 1.6 | 1 | | | 1.6 | 2.2 | 2.2 | 1 |

| | |
|---|--|
| Course Name: Alternative Building Material and technology | |
| Course Code: 17CVT452 | |
| Course outcomes of Alternative Building Material and technology | |
| Sl. No. | Course Outcomes |
| C214a.1 | Identify material properties (physical, structural) for most common and advanced building materials. |
| C214a.2 | Recognize typical and potential applications of alternative building materials. |
| C214a.3 | Discuss relationship between material properties and structural form. |
| C214a.4 | Identify crucial problem areas in manufacture and applications of building |
| C214a.5 | Evaluate the importance of experimental verification of material properties |

| Course Name: Alternative Building Material and technology | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT452 | | | | | | | | | | | | | | | |
| POs & PSOs of Alternative Building Material and technology | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C214a.1 | 2 | | | | | 1 | 3 | | | | | 1 | | 2 | |
| C214a.2 | 2 | | | | | 1 | 3 | | | | | 1 | | 2 | |
| C214a.3 | 2 | | | | | 1 | 3 | | | | | 1 | | 2 | |
| C214a.4 | 2 | | | | | 1 | 3 | | | | | 1 | | 2 | |
| C214a.5 | 2 | | | | | 1 | 3 | | | | | 1 | | 2 | |
| C214a | 2 | | | | | 1 | 3 | | | | | 1 | | 2 | |

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|---|---|
| Course Name: Advanced Concrete Technology | |
| Course Code: 17CVT453 | |
| Course outcomes of Advanced Concrete Technology | |
| Sl. No. | Course Outcomes |
| C214b.1 | Recognize suitable admixtures to be used in different type of concrete. |
| C214b.2 | Design different grades of concrete. |
| C214b.3 | Discuss the importance of durability of concrete. |
| C214b.4 | Identify the role of reinforcement on concrete properties. |
| C214b.5 | Explain the basic knowledge of emerging concrete. |

| Course Name: Advanced Concrete Technology | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT453 | | | | | | | | | | | | | | | |
| POs & PSOs of Advanced Concrete Technology | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C214b.1 | 3 | 2 | | 2 | 1 | | | | | | | | 3 | 3 | 1 |
| C214b.2 | 2 | 1 | 3 | 1 | | | | | | | | | 2 | 3 | 1 |
| C214b.3 | 3 | 2 | 1 | 2 | | | | | | | | | 2 | 3 | 1 |
| C214b.4 | 2 | 3 | | 1 | | | | | | | | | 3 | 3 | 1 |
| C214b.5 | 3 | 2 | | 1 | | | 1 | | | | | | 2 | 3 | 3 |
| C214b | 2.6 | 2 | 2 | 1.4 | 1 | | 1 | | | | | | 2.4 | 3 | 1.4 |

| Course Code: 17CVT454 | |
|---|--|
| Course outcomes of Online Certification Course, IIRS- ISRO certification. | |
| Sl. No. | Course Outcomes |
| C214c.1 | Explain advanced micro wave remote sensing system. |
| C214c.2 | Understand the advanced navigation system of ISRO. |
| C214c.3 | Utilize hyper spectral remote sensing image processing techniques. |
| C214c.4 | Explain extra-terrestrial remote sensing techniques. |
| C214c.5 | Apply knowledge in complex civil engineering projects. |

| Course Name: Online Certification Course, IIRS- ISRO certification. | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT454 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification Course, IIRS- ISRO certification. | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C214c.1 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| C214c.2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| C214c.3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| C214c.4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| C214c.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| C214c | 3 | 2.6 | 3 | 2.4 | 3 | 3 | 2.8 | 3 | 2 | 3 | 2.2 | 3 | 3 | 3 | 3 |

| Course Name: Environmental Air Pollution | |
|--|---|
| Course Code: 17CVT462 | |
| Course outcomes of Environmental Air Pollution | |
| Sl. No. | Course Outcomes |
| C215a.1 | Examine emission standards for industrial and other sources. |
| C215a.2 | Identify air pollution concentrations as a function of emission, meteorology, topography and the built environment. |
| C215a.3 | Discuss impact of air pollution on health of humans, animals, plants and materials. |
| C215a.4 | Identify different equipment's for air quality monitoring and control. |
| C215a.5 | Distinguish between global and local effects of air pollution, recognize the legal aspects of air pollution. |

| Course Name: Environmental Air Pollution | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT462 | | | | | | | | | | | | | | | |
| POs & PSOs of Environmental Air Pollution | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C215a.1 | 1 | | | | | 3 | 2 | 1 | | | | 1 | 1 | 1 | 3 |
| C215a.2 | 2 | 3 | | | | 1 | 1 | 1 | | | | | 1 | 1 | 3 |
| C215a.3 | 2 | 1 | | | | 1 | 3 | | | | | | 1 | 1 | 3 |
| C215a.4 | 2 | 3 | | | 3 | 1 | 1 | | | | | | 1 | 1 | 3 |
| C215a.5 | 2 | 1 | 3 | | | 2 | 1 | | | | | | 1 | 1 | 3 |
| C215a | 2 | 2 | 3 | | 3 | 1.6 | 1.6 | 1 | | | | 1 | 1 | 1 | 3 |

| Course Name: Remote Sensing and GIS | |
|---|--|
| Course Code: 17CVT463 | |
| Course outcomes of Remote Sensing and GIS | |
| Sl. No. | Course Outcomes |
| C215b.1 | Describe remote sensing technology. |
| C215b.2 | Explain different types of sensors and platforms. |
| C215b.3 | Create GIS maps and interpretation. |
| C215b.4 | Process about the hyper spectral remote sensing systems. |
| C215b.5 | Apply RS and GIS in Civil Engineering |

| Course Name: Remote Sensing and GIS | | | | | | | | | | | | | | | |
|--------------------------------------|-----|------|-----|------|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT463 | | | | | | | | | | | | | | | |
| POs & PSOs of Remote Sensing and GIS | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C215b.1 | 3 | | | | 2 | 1 | | | | | | | 3 | 3 | 2 |
| C215b.2 | 1 | | | 2 | 3 | | | | | | | 1 | 3 | 3 | 1 |
| C215b.3 | 2 | 1 | 3 | 2 | | | | | 1 | | | 1 | 3 | 3 | 3 |
| C215b.4 | 1 | 2 | 2 | 3 | 1 | | | | | | | | 3 | 3 | 1 |
| C215b.5 | 3 | 2 | 1 | | 1 | | | | 1 | | | | 3 | 3 | 1 |
| C215b | 2 | 1.67 | 2 | 2.33 | 1.75 | 1 | | | 1 | | | 1 | 3 | 3 | 1.6 |

| Course Name: Concrete Laboratory | |
|--|---|
| Course Code: 17CVL47 | |
| Course outcomes of Concrete Laboratory | |
| Sl. No. | Course Outcomes |
| C216.1 | identify the relevant physical properties pertaining to the construction materials |
| C216.2 | Identify the suitability of the materials for the construction works. |
| C216.3 | Recommend the relevant IS testing procedure to be carried out to ascertain the quality of building materials. |
| C216.4 | Design a concrete mix as per IS 10262:2009 |
| C216.5 | Recognize the construction techniques to be followed in Brick and Stone Masonry |

| Course Name: Concrete Laboratory | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|------|------|-----|------|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL47 | | | | | | | | | | | | | | | |
| POs & PSOs of Concrete Laboratory | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C216.1 | 2 | 2 | | | 1 | 1 | 2 | | 2 | 2 | | 3 | 1 | 2 | 1 |
| C216.2 | 3 | 2 | | 2 | 1 | 1 | 2 | | 2 | 2 | | 3 | 3 | 3 | 1 |
| C216.3 | 3 | 2 | 2 | 1 | | 2 | | | 2 | 2 | | 2 | 3 | 2 | 1 |
| C216.4 | 3 | 2 | 3 | | | 1 | 1 | | 1 | 1 | | 2 | 3 | 3 | 1 |
| C216.5 | 3 | 2 | | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 3 | 3 | 1 |
| C216 | 2.8 | 2 | 2.5 | 1.67 | 1.33 | 1.2 | 1.67 | | 1.8 | 1.8 | 2 | 2.4 | 2.6 | 2.6 | 1 |

| Course Name: Surveying Practice-II | |
|--|--|
| Course Code: 17CVL48 | |
| Course outcomes of Surveying Practice-II | |
| Sl. No. | Course Outcomes |
| C217.1 | Recognise the importance of theodolite in the field of surveying. |
| C217.2 | Construct the simple curves using different linear methods. |
| C217.3 | Illustrate the concepts and principles in setting out simple and compounds curves. |
| C217.4 | Illustrate the use of total station in the different fields of surveying. |
| C217.5 | Compute the coordinates and to measure distances using GPS. |

| Course Name: Surveying Practice-II | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL48 | | | | | | | | | | | | | | | |
| POs & PSOs of Surveying Practice-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C217.1 | 3 | 3 | 2 | | 1 | | | | 3 | 2 | | 2 | 3 | 3 | 1 |
| C217.2 | 3 | 3 | 3 | 1 | 1 | | | | 2 | | | 2 | 3 | 3 | 1 |
| C217.3 | 3 | 3 | 3 | 1 | 1 | | | | 2 | | | 2 | 3 | 3 | 1 |
| C217.4 | 2 | 2 | 2 | | 3 | | | | 3 | 2 | | 3 | 3 | 3 | 2 |
| C217.5 | 3 | 1 | | | 3 | | | | 2 | 1 | | 3 | 3 | 2 | 1 |
| C217 | 2.8 | 2.4 | 2.5 | 1 | 1.8 | | | | 2.4 | 1.67 | | 2.4 | 3 | 2.8 | 1.2 |

| | |
|--|---|
| Course Name: Integrated Rural Development - Part 2 | |
| Course Code: 17CVH49 | |
| Course outcomes of Integrated Rural Development - Part 2 | |
| Sl. No. | Course Outcomes |
| C218.1 | Further develop their social and communication skills by interacting with residents of the village and within their team. |
| C218.2 | Conceptualize long term solution to challenges in villages, thus developing a sense of entrepreneurship. |
| C218.3 | Make an impact to rural sections of society, thus building their self-confidence. |
| C218.4 | Deep understanding the socio economic problems. |
| C218.5 | Improve the quality of Education in villages. |

| Course Name: Integrated Rural Development - Part 2 | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVH49 | | | | | | | | | | | | | | | |
| POs & PSOs of Integrated Rural Development - Part 2 | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C218.1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| C218.2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C218.3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| C218.4 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| C218.5 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| C218 | 2 | 2.2 | 2.8 | 2.8 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.4 | 2.2 | 3 | 3 | 3 |

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|--|--|
| Course Name: Transportation Engineering (IC) | |
| Course Code: 17CVI51 | |
| Course outcomes of Transportation Engineering (IC) | |
| Sl. No. | Course Outcomes |
| C301.1 | Detailed study of road transport that includes characteristics features, various committee. Recommendations, different road patterns and road development programs in India. |
| C301.2 | Factors influencing road alignment, different types of road surveys and factors influencing geometric design. |
| C301.3 | Horizontal and vertical alignment, Pavement materials and its properties. |
| C301.4 | Pavement design as per IRC and details of pavement. |
| C301.5 | Importance of Highway Drainage system and Highway Economics. |

| Course Name: Transportation Engineering (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVI51 | | | | | | | | | | | | | | | |
| POs & PSOs of Transportation Engineering (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C301.1 | 3 | 2 | | 3 | | 2 | | | | 1 | | | 2 | 2 | 1 |
| C301.2 | 3 | 3 | 2 | 2 | | 1 | | | | | | | 2 | 1 | 1 |
| C301.3 | 3 | 3 | 2 | 2 | | 1 | | | | | | | 2 | 2 | 1 |
| C301.4 | 3 | 2 | 3 | 2 | | 1 | | | | | | | 1 | 3 | 1 |
| C301.5 | 2 | 3 | 1 | 2 | | 1 | | | | 2 | | | 1 | 2 | 1 |
| C301 | 2.8 | 2.6 | 2 | 2.2 | | 1.2 | | | | 1.5 | | | 1.6 | 2 | 1 |

| Course Name: Structural Analysis-II | |
|---|---|
| Course Code: 17CVT52 | |
| Course outcomes of Structural Analysis-II | |
| Sl. No. | Course Outcomes |
| C302.1 | Analyse beams and frames by slope deflection method |
| C302.2 | To solve the problems connected with analysis of various structural components |
| C302.3 | To analyse the given frames by suitable method. |
| C302.4 | To evaluate the continuous beams by suitable methods. |
| C302.5 | To understand the basic concepts of principles of dynamics, Rolling load analysis and influence line diagram for S.S beams. |

| Course Name: Structural Analysis-II | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT52 | | | | | | | | | | | | | | | |
| POs & PSOs of Structural Analysis-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C302.1 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 2 |
| C302.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C302.3 | 2 | 3 | 2 | 1 | | | | | | | | | 1 | 3 | 1 |
| C302.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 2 |
| C302.5 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C302 | 1 | 2 | | 1.3 | | | | | | | | | | 1.8 | 2 |

| Course Name: Design of RCC Structural Elements (IC) | |
|---|--|
| Course Code: 17CVI53 | |
| Course outcomes of Design of RCC Structural Elements (IC) | |
| Sl. No. | Course Outcomes |
| C303.1 | Recognize the design philosophies of reinforced concrete structures. |
| C303.2 | Apply the principles, procedures and current code requirements to the analysis and design of reinforced concrete beams using limit state method. |
| C303.3 | Understand and Design Reinforced Concrete slabs. |
| C303.4 | Analyse and Design the Reinforced Concrete Columns and stair cases. |
| C303.5 | Design structures for serviceability and footings. |

| Course Name: Design of RCC Structural Elements (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVI53 | | | | | | | | | | | | | | | |
| POs & PSOs of Design of RCC Structural Elements (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C303.1 | 1 | 3 | | 2 | | | | | | | | | 1 | 3 | |
| C303.2 | 2 | 3 | | 1 | | | | 1 | | | | | 1 | 3 | |
| C303.3 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303.4 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303.5 | 2 | 2 | 3 | 1 | | | | | | | | | 1 | 3 | |
| C303 | 1.8 | 2.4 | 3 | 1 | | | | 1 | | | | | 1 | 3 | |

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|---|---|
| Course Name: Advanced Fluid Mechanics | |
| Course Code: 17CVT542 | |
| Course outcomes of Advanced Fluid Mechanics | |
| Sl. No. | Course Outcomes |
| C304a.1 | Apply the principles of dimensional analysis and similitude to solve engineering problems and use dimensionless parameters. |
| C304a.2 | Analyse models and compute the parametric values in prototype by analysing the corresponding model parameters |
| C304a.3 | Analyse and apply viscous flow principle for engineering problems. |
| C304a.4 | Apply the concept of boundary layer condition for analysing engineering problems. |
| C304a.5 | Apply the principles of Impulse-Momentum for engineering problems. |

| Course Name: Advanced Fluid Mechanics | | | | | | | | | | | | | | | |
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| Course Code: 17CVT542 | | | | | | | | | | | | | | | |
| POs & PSOs of Advanced Fluid Mechanics | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C304a.1 | 3 | 2 | | 1 | | | | | | | | | 2 | 3 | 3 |
| C304a.2 | 2 | 3 | 2 | 1 | | | | | | | | | 2 | 3 | 3 |
| C304a.3 | 1 | 2 | 3 | 3 | | | | | | | | | 1 | 3 | 3 |
| C304a.4 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C304a.5 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C304a | 2 | 2.6 | 1.75 | 1.6 | | | | | | | | | 1.4 | 3 | 3 |

| | |
|--|---|
| Course Name: Traffic Engineering | |
| Course Code: 17CVT543 | |
| Course outcomes of Traffic Engineering | |
| Sl. No. | Course Outcomes |
| C304b.1 | The objective and scope of traffic engineering and traffic characteristics. |
| C304b.2 | Understand interpretation of the traffic study and traffic flow theory. |
| C304b.3 | Conduct traffic studies and analyse traffic data |
| C304b.4 | Design traffic signal systems |
| C304b.5 | Understand traffic regulation and control and ITS. |

| Course Name: Traffic Engineering | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT543 | | | | | | | | | | | | | | | |
| POs & PSOs of Traffic Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C304b.1 | 3 | | 3 | | | | | | | | | 2 | 2 | 2 | 1 |
| C304b.2 | 2 | 2 | | 2 | | | | | | | | 2 | 3 | 2 | 1 |
| C304b.3 | | 2 | 3 | 3 | | | | | | | | 3 | 2 | 2 | 1 |
| C304b.4 | | 2 | 2 | 1 | | | | | | | | | 2 | 3 | 1 |
| C304b.5 | 1 | | | | 2 | 2 | | | | | | 2 | 1 | 2 | 1 |
| C304b | 2 | 2 | 2.6 | 2 | 2 | 2 | | | | | | 2.25 | 2 | 2.2 | 1 |

| | |
|--|---|
| Course Name: Construction Management and Engineering Economics | |
| Course Code: 17CVT552 | |
| Course outcomes of Construction Management and Engineering Economics | |
| Sl. No. | Course Outcomes |
| C305.1 | Understand the nature of construction industry and the importance of management |
| C305.2 | Formulate project management principles to solve problems on construction network and time estimates. |
| C305.3 | Understand the importance of Resources management in construction |
| C305.4 | Apply the concepts of economics and finance in constructions |
| C305.5 | Understand the concepts of financial management in construction and construction accounting. |

| Course Name: Construction Management and Engineering Economics | | | | | | | | | | | | | | | |
|---|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT552 | | | | | | | | | | | | | | | |
| POs & PSOs of Construction Management and Engineering Economics | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C305.1 | 2 | | | | | | | | 2 | | 3 | | | 3 | |
| C305.2 | 3 | 3 | | 1 | 2 | | | | | | 3 | | | 3 | |
| C305.3 | 3 | 3 | | 3 | | | | | 1 | 1 | 3 | | | 3 | |
| C305.4 | | | | | | 1 | | | | | 3 | | | 3 | |
| C305.5 | 1 | | | | | | | | | | 3 | | | 3 | |
| C305 | 2.25 | 3 | | 2 | 2 | 1 | | | 1.5 | 1 | 3 | | | 3 | |

| Course Name: Hydrology and Irrigation Engineering | |
|---|---|
| Course Code: 17CVT563 | |
| Course outcomes of Hydrology and Irrigation Engineering | |
| Sl. No. | Course Outcomes |
| C306.1 | Apply the knowledge of hydrology to estimate the availability of rainfall with respect to time and space. |
| C306.2 | Analyse the various types of water losses to forecast runoff. |
| C306.3 | Plan and design flood estimation aspects. |
| C306.4 | Understand the fundamentals principles of irrigation engineering. |
| C306.5 | Investigate crop water requirements and design of canal systems. |

| Course Name: Hydrology and Irrigation Engineering | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT563 | | | | | | | | | | | | | | | |
| POs & PSOs of Hydrology and Irrigation Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C306.1 | 3 | 2 | | 1 | | | 2 | | | | | | 2 | 3 | 3 |
| C306.2 | 1 | 2 | | 3 | | | 2 | | | | | | 1 | 3 | 3 |
| C306.3 | 1 | 2 | 3 | | | | 1 | | | | | | 3 | 3 | 3 |
| C306.4 | 3 | 2 | | | | | 1 | | | | | | 1 | 3 | 3 |
| C306.5 | 1 | 2 | 3 | | | | 1 | | | | | 1 | 1 | 3 | 3 |
| C306 | 1.8 | 2 | 3 | 2 | | | 1.4 | | | | | 1 | 1.6 | 3 | 3 |

| Course Name: Fluid Mechanics Lab | |
|--|---|
| Course Code: 17CVL57 | |
| Course outcomes of Fluid Mechanics Lab | |
| Sl. No. | Course Outcomes |
| C307.1 | Apply the knowledge gained in the field of fluid mechanics and hydraulics. |
| C307.2 | Demonstrate and analyse static and dynamic fluid conditions. |
| C307.3 | Gain knowledge about measurement of flows and will be able to calibrate them. |
| C307.4 | Estimate the major loss of head in pipe flow. |
| C307.5 | Analyse the impact of jets on various types of vanes and evaluate performance characteristics of turbines and pump. |

| Course Name: Fluid Mechanics Lab | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL57 | | | | | | | | | | | | | | | |
| POs & PSOs of Fluid Mechanics Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C307.1 | 3 | 2 | | | | | 1 | | | | | | 1 | 3 | 3 |
| C307.2 | 1 | 2 | | 3 | | | | | | | | | 1 | 3 | 2 |
| C307.3 | 3 | 2 | | 1 | 1 | | | | | | | | 3 | 3 | 2 |
| C307.4 | 2 | 3 | | 1 | | | | | 1 | | | | 1 | 3 | 3 |
| C307.5 | 2 | 2 | | 3 | | | | | 1 | | | | 1 | 3 | 3 |
| C307 | 2.2 | 2.2 | | 2 | 1 | | 1 | | 1 | | | | 1.4 | 3 | 2.6 |

| Course Name: Analysis and Design Lab-I | |
|--|--|
| Course Code: 17CVL58 | |
| Course outcomes of Analysis and Design Lab-I | |
| Sl. No. | Course Outcomes |
| C308.1 | To impart FEM software for the analysis of structural elements |
| C308.2 | Draw SFD and BMD for various kind of beam using Excel. |
| C308.3 | Prepare design spared sheet. |
| C308.4 | Design RCC components using excel |
| C308.5 | Plot graph for various problems using excel |

| Course Name: Analysis and Design Lab-I | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL58 | | | | | | | | | | | | | | | |
| POs & PSOs of Analysis and Design Lab-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C308.1 | 1 | 3 | 3 | 3 | 3 | | | | 2 | | 1 | 2 | | 3 | |
| C308.2 | 1 | 3 | 3 | 2 | 3 | | | | 2 | | | 2 | 1 | 2 | |
| C308.3 | 1 | 3 | 3 | | | | | | 1 | 1 | 2 | 2 | | 3 | |
| C308.4 | 2 | 3 | 3 | 2 | | | | | 1 | | | 2 | | 3 | |
| C308.5 | 2 | 3 | 1 | 2 | | | | | 2 | 1 | 1 | 2 | 1 | 2 | |
| C308 | 1.4 | 3 | 2.6 | 2.25 | 3 | | | | 1.6 | 2 | 1.3 | 2 | 1 | 2.6 | |

| Course Name: General Aptitude | |
|-------------------------------------|---|
| Course Code: 17CVH59 | |
| Course outcomes of General Aptitude | |
| Sl. No. | Course Outcomes |
| C309.1 | Solve and analyse different types of numerical / arithmetical problems. |
| C309.2 | Solve and analyse different data interpretation problems. |
| C309.3 | Acquire satisfactory competency in the use of numerical ability. |
| C309.4 | Understand the basic concepts of logical reasoning. |
| C309.5 | Compete in various competitive exams. |

| Course Name: General Aptitude | | | | | | | | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVH59 | | | | | | | | | | | | | | | |
| POs & PSOs of General Aptitude | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C309.1 | 3 | 2 | 1 | | | | | | | | | 1 | | 1 | |
| C309.2 | 3 | 2 | 1 | | | | | | | | | 1 | | 1 | |
| C309.3 | 3 | 2 | 1 | 1 | | | | | | | | 1 | | 1 | |
| C309.4 | 3 | 2 | 1 | 1 | | | | | | | | 1 | | 1 | |
| C309.5 | 3 | 2 | 1 | 1 | | | | | 1 | 1 | | 2 | | 1 | |
| C309 | 3 | 2 | 1 | 1 | | | | | 1 | 1 | | 1,2 | | 1 | |

| Course Name: Design of Steel Structures (IC) | |
|--|---|
| Course Code: 16CVI61 | |
| Course outcomes of Design of Steel Structures (IC) | |
| Sl. No. | Course Outcomes |
| C310.1 | Understand the concept of Limit State Design of steel structures. |
| C310.2 | Analyse and design steel structural beams subjected to plastic behaviour. |
| C310.3 | Capable of design various steel components using bolted and welded connections and also to develop a Cad drawing for the fabrication of different components of structures. |
| C310.4 | Apply Indian Standard code provisions for the design of tension and compression members. |
| C310.5 | Design flexural members and bases |

| Course Name: Design of Steel Structures (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 16CVI61 | | | | | | | | | | | | | | | |
| POs & PSOs of Design of Steel Structures (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C310.1 | 2 | 1 | 3 | | | | | | | | | | 1 | 3 | |
| C310.2 | 1 | 1 | 3 | 3 | | | | | | | | | | 3 | |
| C310.3 | 1 | 2 | 3 | | | | | | | | | | | 3 | |
| C310.4 | 1 | 2 | 3 | | | | | 2 | | | | | | 3 | |
| C310.5 | 1 | 2 | 3 | | | | | | | | | | | 3 | |
| C310 | 1.2 | 1 | 2.75 | 3 | 2 | | | 2 | | | | 2 | 1 | 2.75 | |

| | |
|---|---|
| Course Name: Geotechnical Engineering-I | |
| Course Code: 17CVT62 | |
| Course outcomes of Geotechnical Engineering-I | |
| Sl. No. | Course Outcomes |
| C311.1 | Solve three phase system problems. |
| C311.2 | Carry out index properties of soil and classification. |
| C311.3 | Solve any practical problems related to permeability and compaction. |
| C311.4 | Solve practical problems related to consolidation settlement and time rate of settlement. |
| C311.5 | Estimate the shear strength parameters in cohesive and cohesion less soils. |

| Course Name: Geotechnical Engineering-I | | | | | | | | | | | | | | | |
|--|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT62 | | | | | | | | | | | | | | | |
| POs & PSOs of Geotechnical Engineering-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C311.1 | 3 | 2 | 1 | | | | | | | | | | 1 | 3 | |
| C311.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | |
| C311.3 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C311.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C311.5 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | |
| C311 | 2.4 | 2.6 | 1 | 1.25 | | | | | | | | | 1 | 3 | 3 |

| Course Name: Environmental Engineering (IC) | |
|---|--|
| Course Code: 17CVI63 | |
| Course outcomes of Environmental Engineering (IC) | |
| Sl. No. | Course Outcomes |
| C312.1 | Recognize the importance of water to protect the water resources which is facing a continuous degradation in water quality. |
| C312.2 | Recognize that water supply and sanitation is an important professional and ethical responsibility of civil engineer. |
| C312.3 | Demonstrate an ability to recognize the type of unit operations and processes involved in water and wastewater treatment plants. |
| C312.4 | Demonstrate an ability to design individual unit operation in treatment of water and wastewater. |
| C312.5 | Demonstrate ability in monitoring and analysis of water and waste water quality parameters |

| Course Name: Environmental Engineering (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVI63 | | | | | | | | | | | | | | | |
| POs & PSOs of Environmental Engineering (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C312.1 | 1 | | | | | 2 | 3 | | 1 | | | | 1 | 3 | 3 |
| C312.2 | 1 | | | | | 2 | 3 | 2 | | | | | 3 | | 2 |
| C312.3 | 1 | | 2 | | | 2 | 3 | | | | | | 3 | | 3 |
| C312.4 | 1 | | 3 | | | 2 | 2 | | | | | | 3 | 3 | 3 |
| C312.5 | 1 | | | | 2 | 1 | 3 | 2 | | | | | 1 | 2 | 3 |
| C312 | 1 | | 2.5 | | 2 | 1.8 | 2.8 | 2 | 1 | | | | 2.2 | 2.67 | 2.8 |

| Course Name: Advanced Transportation Engineering | |
|--|--|
| Course Code: 17CVT642 | |
| Course outcomes of Advanced Transportation Engineering | |
| Sl. No. | Course Outcomes |
| C313.1 | Introduction to Railway Engineering and its importance in transportation sector |
| C313.2 | Importance of Traction and Tractive resistance and Geometric Design in Railways |
| C313.3 | Importance of Airport Engineering and Basic Runway Design in Airport Engineering |
| C313.4 | Definition of Tunnel, Different types of tunnels and methods of tunnelling |
| C313.5 | To learn the importance of Harbour and dock construction. |

| Course Name: Advanced Transportation Engineering | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT642 | | | | | | | | | | | | | | | |
| POs & PSOs of Advanced Transportation Engineering | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C313.1 | 2 | 2 | | | 1 | 2 | | | | | | 2 | | 1 | 1 |
| C313.2 | 2 | 3 | 2 | | | | | | | | | 1 | 1 | 3 | 1 |
| C313.3 | 2 | 1 | | 2 | | | | | | | | | 2 | 1 | 1 |
| C313.4 | 1 | | 1 | 2 | | | | | | | | 2 | 1 | 3 | 1 |
| C313.5 | 2 | | | | | | | | | | | 1 | | 1 | 1 |
| C313 | 1.8 | 2 | 1.5 | 2 | 1 | 2 | | | | | | 1.5 | 2 | 1.8 | 1 |

| Course Name: Pavement Materials and Construction | |
|--|--|
| Course Code: 17CVT653 | |
| Course outcomes of Pavement Materials and Construction | |
| Sl. No. | Course Outcomes |
| C314.1 | Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes |
| C314.2 | Analyse flexible pavements and rigid pavements. |
| C314.3 | Understand the need of various equipment required for construction of highways. |
| C314.4 | Construction of flexible pavement and rigid pavement. |
| C314.5 | Prepare quality assurance and quality control plans in an attempt to construct better performing pavements |

| Course Name: Pavement Materials and Construction | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT653 | | | | | | | | | | | | | | | |
| POs & PSOs of Pavement Materials and Construction | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C314.1 | 3 | | | | | 1 | 2 | | | | | 1 | 1 | 2 | 1 |
| C314.2 | 2 | 3 | 2 | | | | | | | | | 2 | 2 | 3 | 1 |
| C314.3 | | 1 | | 2 | 3 | | | | | | | | 2 | 3 | 1 |
| C314.4 | 1 | | 3 | 3 | | | | | | | | | 2 | 3 | 1 |
| C314.5 | 1 | | | 2 | | 2 | 3 | | | | | 2 | 1 | 2 | 1 |
| C314 | 1.4 | 2 | 2.5 | 2.3 | 3 | 1.5 | 2.5 | | | | | 1.6 | 1.6 | 2.6 | 1 |

| | |
|--|---|
| Course Name: Yoga and Meditation | |
| Course Code: 17HOE662 | |
| Course outcomes of Yoga and Meditation | |
| Sl. No. | Course Outcomes |
| C315a.1 | Know the basic principles of yoga |
| C315a.2 | Know and practice the basic asana and their benefits. |
| C315a.3 | Use pranayama and meditation for improving health and mental peace. |
| C315a.4 | Know the difference between meditation and concentration. |
| C315a.5 | Apply the principles of Ayurveda and implement them for ones benefit. |

| Course Name: Yoga and Meditation | | | | | | | | | | | | | | | |
|-----------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17HOE662 | | | | | | | | | | | | | | | |
| POs & PSOs of Yoga and Meditation | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315a.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315a.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315a.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315a.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315a.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315a | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Martial Arts | |
|---------------------------------|--|
| Course Code: 17HOE663 | |
| Course outcomes of Martial Arts | |
| Sl. No. | Course Outcomes |
| C315b.1 | Demonstrate a grasp of the various Martial Arts' notion of "self-cultivation" and be able to relate it to their own personal growth |
| C315b.2 | Demonstrate the practical leadership skills and intercultural literacy needed to assume entry level leadership positions in business, government, and in civil society |
| C315b.3 | Develop appreciation of diversity in the world and in intellectual areas such as but not limited to the humanities and the social sciences. |
| C315b.4 | Show the desire and ability to pursue learning throughout life |
| C315b.5 | Demonstrate strong written and oral communication skills |

| Course Name: Martial Arts | | | | | | | | | | | | | | | |
|----------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 15HOE663 | | | | | | | | | | | | | | | |
| POs & PSOs of Martial Arts | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315b.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315b.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315b.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315b.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315b.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315b | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| | |
|--------------------------|--|
| Course Name: Dance | |
| Course Code: 17HOE665 | |
| Course outcomes of Dance | |
| Sl. No. | Course Outcomes |
| C315c.1 | Get an insight into various types of Indian dances. |
| C315c.2 | Gain knowledge of different instruments used to perform dance. |
| C315c.3 | Perform exercises on prarthane, Namaskara according to Bharatanatya style. |
| C315c.4 | Perform basic steps in Abhinaya. |
| C315c.5 | Recognise and perform different Adavus. |

| Course Name: Dance | | | | | | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17HOE665 | | | | | | | | | | | | | | | |
| POs & PSOs of Dance | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315c.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315c.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315c.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315c.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315c.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315c | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| | |
|---------------------------|--|
| Course Name: Sports | |
| Course Code: 17HOE666 | |
| Course outcomes of Sports | |
| Sl. No. | Course Outcomes |
| C315d.1 | Demonstrate adequate knowledge and competencies needed to be successful sports management professionals. |
| C315d.2 | Apply knowledge and skills learned throughout the curriculum in real world. |
| C315d.3 | Apply critical thinking and reasoning skills as sports professionals. |
| C315d.4 | Communicate, orally and in writing, as a sports professional within various sports. |
| C315d.5 | Analyse situations and apply the principles of appropriate leadership skills and behaviours related to sports and sport leadership responsibilities. |

| Course Name: Sports | | | | | | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17HOE666 | | | | | | | | | | | | | | | |
| POs & PSOs of Sports | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315d.1 | | | | | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | | | 2 |
| C315d.2 | | | | | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315d.3 | | | | | | 2 | 3 | 3 | 3 | 1 | 2 | 2 | | | 2 |
| C315d.4 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315d.5 | | | | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | | | 2 |
| C315d | | | | | 1.75 | 2.8 | 3 | 3 | 2.8 | 1.6 | 2 | 2.4 | | | 2 |

| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 17HOE667 | |
| Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C315e.1 | Learn the use of different online tools. |
| C315e.2 | Analyse the problems. |
| C315e.3 | Communicate effectively on engineering activities. |
| C315e.4 | Design and develop solutions for complex problems. |
| C315e.5 | Apply the knowledge of engineering fundamentals. |

| Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
|--|-----|-----|------|------|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17HOE667 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C315e.1 | 2 | 1 | | 2 | 3 | | | | | | | | 1 | 3 | 1 |
| C315e.2 | 1 | 3 | 2 | | 1 | | | | | | | | 1 | 3 | 1 |
| C315e.3 | 2 | 1 | 1 | | | | | | | 3 | | | 1 | 3 | 1 |
| C315e.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | 1 |
| C315e.5 | 3 | 2 | 1 | 1 | | | | | | | | | 1 | 3 | 1 |
| C315e | 1.8 | 1.8 | 1.75 | 1.67 | 1.33 | | | | | 3 | | | 1 | 3 | 1 |

| Course Name: Detailing of Structural Elements Lab | |
|---|--|
| Course Code: 17CVL67 | |
| Course outcomes of Detailing of Structural Elements Lab | |
| Sl. No. | Course Outcomes |
| C316.1 | Execute computer aided drawing for detailing different structural components |
| C316.2 | Develop working drawing for structural fabrication based on design. |
| C316.3 | Set up a drawing of different components which are useful for the industries |
| C316.4 | Interpret and analyse views of a drawing |
| C316.5 | Design of structural components as per IS standards |

| Course Name: Detailing of Structural Elements Lab | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL67 | | | | | | | | | | | | | | | |
| POs & PSOs of Detailing of Structural Elements Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C316.1 | 1 | | 3 | 2 | 2 | | | | | | | | 2 | 3 | |
| C316.2 | | 2 | 3 | 1 | 2 | | | | | | | | 2 | 3 | |
| C316.3 | | 2 | 3 | 1 | 1 | | | | | | | | 1 | 3 | |
| C316.4 | 1 | 2 | 3 | 2 | 1 | | | | | | | | 1 | 3 | |
| C316.5 | | 2 | 3 | 1 | 1 | | | 2 | | | | | 1 | 3 | |
| C316 | 1 | 2 | 3 | 1.4 | 1.4 | | | 2 | | | | | 1.4 | 3 | |

| Course Name: Extensive Survey Camp | |
|--|---|
| Course Code: 17CVL68 | |
| Course outcomes of Extensive Survey Camp | |
| Sl. No. | Course Outcomes |
| C317.1 | Understand of the principles and operation of the Global Positioning System for locating salient features by Total Station. |
| C317.2 | Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork for civil engineering projects. |
| C317.3 | Apply the need for licensed surveyors to establish positioning information for property and structures. |
| C317.4 | Prepare layout plans as per the specifications of the local bodies. |
| C317.5 | Develop communication skills and team work in any project. |

| Course Name: Extensive Survey Camp | | | | | | | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL68 | | | | | | | | | | | | | | | |
| POs & PSOs of Extensive Survey Camp | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C317.1 | 3 | 2 | 2 | 1 | 2 | | | | 2 | 2 | | 1 | 3 | 3 | 2 |
| C317.2 | 2 | 2 | 1 | | 1 | | | | 2 | 1 | | 1 | 2 | 3 | 1 |
| C317.3 | 1 | | 2 | | | 2 | | 1 | | | | 1 | 1 | 3 | 1 |
| C317.4 | 2 | 1 | 2 | | 2 | 1 | | 1 | | | | 1 | 3 | 3 | 1 |
| C317.5 | 2 | 1 | | | | | | | 2 | 3 | | | 2 | 2 | 2 |
| C317 | 2 | 1.2 | 1.4 | 1 | 1.66 | 1.5 | | 1 | 2 | 2 | | 1 | 2.2 | 2.8 | 1.4 |

| | |
|--|--|
| Course Name: Technical Aptitude and GD | |
| Course Code: 17CVH69 | |
| Course outcomes of Technical Aptitude and GD | |
| Sl. No. | Course Outcomes |
| C318.1 | Solve and analyse different types of technical problems. |
| C318.2 | Solve and analyse different data interpretation problems. |
| C318.3 | Acquire satisfactory competency in solving technical problems. |
| C318.4 | Use the communication skills in further activities. |
| C318.5 | Apply the knowledge of group discussion in further placement activities. |

| Course Name: Technical Aptitude and GD | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVH69 | | | | | | | | | | | | | | | |
| POs & PSOs of Technical Aptitude and GD | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C318.1 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.2 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.3 | 2 | 3 | | | | | | | 2 | | | 1 | 2 | 2 | 2 |
| C318.4 | | | | | | | | | 2 | 3 | | 1 | | | |
| C318.5 | | | | | | | | | 2 | 3 | | 1 | | | |
| C318 | 2 | 3 | | | | | | | 2 | 3 | | 1 | 2 | 2 | 2 |

| Course Name: Geotechnical Engineering-II (IC) | |
|---|---|
| Course Code: 17CVI71 | |
| Course outcomes of Geotechnical Engineering-II (IC) | |
| Sl. No. | Course Outcomes |
| C401.1 | Analyse any field situation with the knowledge gained. |
| C401.2 | Estimate the stresses that will develop in the soil. |
| C401.3 | Solve any practical problems related to soil stresses estimation, and seepage including flow net diagram. |
| C401.4 | Solve the lateral pressure by different methods. |
| C401.5 | Carry out stability analysis and settlement calculation & solve the SBC of the soil. |

| Course Name: Geotechnical Engineering-II (IC) | | | | | | | | | | | | | | | |
|--|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVI71 | | | | | | | | | | | | | | | |
| POs & PSOs of Geotechnical Engineering-II (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C401.1 | 3 | 2 | 1 | | | | | | | | | | 1 | 3 | 1 |
| C401.2 | 2 | 3 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C401.3 | 2 | 3 | 1 | 1 | | | | | | | | | 1 | 3 | 3 |
| C401.4 | 2 | 3 | 1 | 2 | | | | | | | | | 1 | 3 | 3 |
| C401.5 | 3 | 2 | | 1 | | | | | | | | | 1 | 3 | 1 |
| C401 | 2.4 | 2.6 | 1 | 1.25 | | | | | | | | | 1 | 3 | 1.8 |

| Course Name: Estimation and Valuation (IC) | |
|--|--|
| Course Code: 17CVI72 | |
| Course outcomes of Estimation and Valuation (IC) | |
| Sl. No. | Course Outcomes |
| C402.1 | Explain types of estimate and duties of an Estimator |
| C402.2 | Undertake rate analysis of civil engineering works. |
| C402.3 | Determine the rates of various items of civil works. |
| C402.4 | Calculate estimated cost of civil construction projects. |
| C402.5 | Evaluate the actual value of any property. |

| Course Name: Estimation and Valuation (IC) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----|-----|-----|------|-----|------|------|------|------|------|------|
| Course Code: 17CVI72 | | | | | | | | | | | | | | | |
| POs & PSOs of Estimation and Valuation (IC) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C402.1 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402.2 | 2 | 2 | 1 | | | | 1 | 2 | | | 2 | 1 | 3 | 3 | 2 |
| C402.3 | 2 | 2 | 1 | 1 | | | | | | | 1 | 1 | 3 | 3 | 1 |
| C402.4 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402.5 | 3 | 2 | 2 | 2 | | 2 | | 1 | | | 2 | 2 | 3 | 3 | 2 |
| C402 | 2.6 | 2 | 1.6 | 1.75 | | 2 | 1 | 1.25 | | | 1.8 | 1.6 | 3 | 3 | 1.8 |

| | |
|---|---|
| Course Name: Pre-Stressed Concrete Structures | |
| Course Code: 17CVT732 | |
| Course outcomes of Pre-Stressed Concrete Structures | |
| Sl. No. | Course Outcomes |
| C403.1 | Apply the knowledge of pre stressing, devices and different tensioning systems. |
| C403.2 | Analyse the stresses due to different loads. |
| C403.3 | Calculate losses in PSC members. |
| C403.4 | Determine the limit state of PSC beams in flexure and shear. |
| C403.5 | Design end block and determine anchorage zone stress in members. |

| Course Name: Pre-Stressed Concrete Structures | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT732 | | | | | | | | | | | | | | | |
| POs & PSOs of Pre-Stressed Concrete Structures | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C403.1 | 3 | 3 | 3 | 3 | 2 | | | | | | | 1 | 3 | 3 | 1 |
| C403.2 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403.3 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403.4 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403.5 | 3 | 3 | 3 | 3 | | | | | | | | 1 | 3 | 3 | 1 |
| C403 | 3 | 3 | 3 | 3 | 2 | | | | | | | 1 | 3 | 3 | 1 |

| | |
|---|---|
| Course Name: Fire safety and management | |
| Course Code: 17CVT741 | |
| Course outcomes of Fire safety and management | |
| Sl. No. | Course Outcomes |
| C404a.1 | Make familiar about basic concepts of fire and explosion science. |
| C404a.2 | Know the different source of ignition and their prevention techniques. |
| C404a.3 | Understand the operation of various types of fire fighting equipment's. |
| C404a.4 | Understand the causes and prevention of explosion. |
| C404a.5 | Equip to effectively employ explosion protection techniques and their significances to suit the industrial requirement. |

| Course Name: Fire safety and management | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT741 | | | | | | | | | | | | | | | |
| POs & PSOs of Fire safety and management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C404a.1 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.2 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.3 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.4 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a.5 | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |
| C404a | 2 | 2 | | 1 | 1 | 3 | 3 | 3 | | | | 1 | 3 | 2 | 3 |

| Course Name: Industrial Waste Water treatment | |
|---|--|
| Course Code: 17CVT743 | |
| Course outcomes of Industrial Waste Water treatment | |
| Sl. No. | Course Outcomes |
| C404b.1 | Understand the effect of parameters of pollution on receiving streams. |
| C404b.2 | Advise the regulating authority about the possible danger specific industries. |
| C404b.3 | Develop planning skill in designing water pollution control systems in industries. |
| C404b.4 | Differentiate red category industries from green category industries. |
| C404b.5 | Characterize the different effluents from specific industries. |

| Course Name: Industrial Waste Water treatment | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVT743 | | | | | | | | | | | | | | | |
| POs & PSOs of Industrial Waste Water treatment | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C404b.1 | 1 | | | | | 3 | 2 | 1 | | | | 1 | 1 | 1 | 3 |
| C404b.2 | 2 | 3 | | | | 1 | 1 | 2 | | | | | 1 | 1 | 3 |
| C404b.3 | 2 | 1 | | | | 1 | 3 | | | | | | 2 | 1 | 3 |
| C404b.4 | 2 | 3 | | | 3 | 1 | 1 | | | | | | 1 | 1 | 3 |
| C404b.5 | 2 | 1 | 3 | | | 2 | 1 | | | | | | 1 | 1 | 3 |
| C404b | 1.8 | 2 | 3 | | 3 | 1.6 | 1.6 | 1.5 | | | | 1 | 1.2 | 1 | 3 |

| Course Name: Natural Disaster Mitigation and Management | |
|---|---|
| Course Code: 17HOE753 | |
| Course outcomes of Natural Disaster Mitigation and Management | |
| Sl. No. | Course Outcomes |
| C405.1 | Learn about the types of natural and environmental disaster and its causes. |
| C405.2 | Learn about organizational and administrative strategies for managing disasters. |
| C405.3 | Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation. |
| C405.4 | Apply the key roles of capacity building to face disaster among government bodies, institutions, NGOS. |
| C405.5 | Learn methodologies of disaster risk assessment with the help of latest tools like GPS, GIS AND Remote sensing. |

| Course Name: Natural Disaster Mitigation and Management | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17HOE753 | | | | | | | | | | | | | | | |
| POs & PSOs of Natural Disaster Mitigation and Management | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C405.1 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.2 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.3 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.4 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405.5 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C405 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |

| Course Name: Occupational Safety and Health Administration | |
|--|--|
| Course Code: 17HOE762 | |
| Course outcomes of Occupational Safety and Health Administration | |
| Sl. No. | Course Outcomes |
| C406a.1 | Develop the ability to know the occupational health and safety. |
| C406a.2 | Know the socio - economic aspects of occupational health and safety. |
| C406a.3 | Demonstrate purpose of health screening measures. |
| C406a.4 | Know the legal provisions on occupational health and safety. |
| C406a.5 | Participate in research and occupational health. |

| Course Name: Occupational Safety and Health Administration | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17HOE762 | | | | | | | | | | | | | | | |
| POs & PSOs of Occupational Safety and Health Administration | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C406a.1 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.2 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.3 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.4 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a.5 | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |
| C406a | 1 | 2 | 1 | | | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | |
|---|--|
| Course Code: 17HOE764 | |
| Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX | |
| Sl. No. | Course Outcomes |
| C406b.1 | Creating basic drawings by using REVIT |
| C406b.2 | Manipulating objects in the drawing. |
| C406b.3 | Drawing organization and inquiry commands. |
| C406b.4 | Hatching objects |
| C406b.5 | Working with reusable contents. |

| Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17HOE764 | | | | | | | | | | | | | | | |
| POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C406b.1 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.2 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.3 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.4 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b.5 | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |
| C406b | 1 | | | | 3 | | 3 | | | 1 | | 3 | 3 | 3 | 1 |

| | |
|---|--|
| Course Name: Project Management Lab | |
| Course Code: 17CVL77 | |
| Course outcomes of Project Management Lab | |
| Sl. No. | Course Outcomes |
| C407.1 | Preparing project plans, schedule of construction. |
| C407.2 | Understanding the construction management software. |
| C407.3 | Understanding construction network and time estimates. |
| C407.4 | Understanding the concepts of construction project management. |
| C407.5 | Creating the construction project reports. |

| Course Name: Project Management Lab | | | | | | | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL77 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Management Lab | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C407.1 | 3 | 3 | | | 3 | | | | | | 3 | | 1 | 2 | 1 |
| C407.2 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 2 | 1 |
| C407.3 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 2 | 1 |
| C407.4 | 3 | 3 | | | 3 | | | | | | 3 | | 2 | 3 | 1 |
| C407.5 | 3 | 3 | | | 3 | | | | | | 3 | | 1 | 2 | 1 |
| C407 | 3 | 3 | | | 3 | | | | | | 3 | | 1.6 | 2.2 | 1 |

| Course Name: Analysis and Design Lab-II | |
|---|---|
| Course Code: 17CVL78 | |
| Course outcomes of Analysis and Design Lab-II | |
| Sl. No. | Course Outcomes |
| C408.1 | Design and Analysis of Different components of Structures |
| C408.2 | Apply Spreadsheet calculations to Civil Engineering |
| C408.3 | Analyse water resource networks |
| C408.4 | Apply computing skills to geotechnical engineering |
| C408.5 | Make use of various software package |

| Course Name: Analysis and Design Lab-II | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVL78 | | | | | | | | | | | | | | | |
| POs & PSOs of Analysis and Design Lab-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C408.1 | 1 | 3 | 3 | 1 | 3 | | | | | | | 1 | 1 | 3 | 1 |
| C408.2 | 1 | 2 | | 1 | 2 | | | | | | | | 1 | 3 | 1 |
| C408.3 | 2 | 2 | | | 1 | | | | | | | | 1 | 2 | 1 |
| C408.4 | 1 | 2 | | | | | | | | | | | 1 | 2 | 1 |
| C408.5 | 2 | 1 | | | 3 | | | | | | | 1 | 2 | 2 | 2 |
| C408 | 1.4 | 2 | 3 | 1 | 2.25 | | | | | | | 1 | 1.2 | 2.4 | 1.2 |

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|------------------------------------|---|
| Course Name: Project Phase-I | |
| Course Code: 17CVP79 | |
| Course outcomes of Project Phase-I | |
| Sl. No. | Course Outcomes |
| C409.1 | Engage more in the learning process |
| C409.2 | Think outside the box by thinking differently about the problem |
| C409.3 | Make deep connections between ideas |
| C409.4 | Make them problem-solvers |
| C409.5 | Learn project management |

| Course Name: Project Phase-I | | | | | | | | | | | | | | | |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVP79 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-I | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C409.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C409.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C409.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C409.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C409.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C409 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

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|-------------------------------------|---|
| Course Name: Project Phase-II | |
| Course Code: 17CVP81 | |
| Course outcomes of Project Phase-II | |
| Sl. No. | Course Outcomes |
| C410.1 | Engage more in the learning process |
| C410.2 | Think outside the box by thinking differently about the problem |
| C410.3 | Make deep connections between ideas |
| C410.4 | Make them problem-solvers |
| C410.5 | Learn project management |

| Course Name: Project Phase-II | | | | | | | | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVP81 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-II | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C410.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C410.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C410.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C410.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C410.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C410 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

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|--------------------------------------|---|
| Course Name: Project Phase-III | |
| Course Code: 17CVP82 | |
| Course outcomes of Project Phase-III | |
| Sl. No. | Course Outcomes |
| C411.1 | Engage more in the learning process |
| C411.2 | Think outside the box by thinking differently about the problem |
| C411.3 | Make deep connections between ideas |
| C411.4 | Make them problem-solvers |
| C411.5 | Learn project management |

| Course Name: Project Phase-III | | | | | | | | | | | | | | | |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVP82 | | | | | | | | | | | | | | | |
| POs & PSOs of Project Phase-III | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C411.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C411.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C411.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C411.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C411.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C411 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

| | |
|--|---|
| Course Name: Evaluation and Viva voce (External) | |
| Course Code: 17CVP83 | |
| Course outcomes of Evaluation and Viva voce (External) | |
| Sl. No. | Course Outcomes |
| C412.1 | Engage more in the learning process |
| C412.2 | Think outside the box by thinking differently about the problem |
| C412.3 | Make deep connections between ideas |
| C412.4 | Make them problem-solvers |
| C412.5 | Learn project management |

| Course Name: Evaluation and Viva voce (External) | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Course Code: 17CVP83 | | | | | | | | | | | | | | | |
| POs & PSOs of Evaluation and Viva voce (External) | | | | | | | | | | | | | | | |
| PO'S CO'S | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| C412.1 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| C412.2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C412.3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 2 |
| C412.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| C412.5 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 |
| C412 | 2.2 | 2.4 | 2.4 | 2.6 | 2.2 | 1.2 | 1 | 2.2 | 3 | 1.6 | 2.4 | 2.6 | 1.4 | 2.8 | 2 |

