

## SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY An Autonomous Institution, Affiliated to Anna University Coimbatore - 641 008

## **DEPARTMENT OF CIVIL ENGINEERING**



CURRICULUM AND SYLLABI
BE CIVIL ENGINEERING
REGULATION 2022

(B: 2024-2028)



## SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

An Autonomous Institution affiliated to Anna University, Chennai Kuniamuthur, Coimbatore - 641 008

## **DEPARTMENT OF CIVIL ENGINEERING**

BE CIVIL ENGINEERING
CURRICULUM AND SYLLABI
REGULATION 2022 (B: 2024-2028)
CHOICE BASED CREDIT SYSTEM

#### SRI KRISHNA COLLEGE OF ENGNEERING AND TECHNOLOGY

An Autonomous Institution Affiliated to Anna University
Kuniamuthur, Coimbatore - 641 008

#### VISION AND MISSION OF THE DEPARTMENT

#### **Our Vision**

To be a center of excellence in Civil Engineering Education through full-fledged learningexperience along with research.

#### **Our Mission**

#### To accomplish our vision, we are committed to

- M1: Faculty experts from all specialization of Civil Engineering to facilitate teaching learningprocess
- M2: Excellent infrastructure facilities to apply Civil Engineering knowledge and perform societalbased research
- M3: Exposure to latest technologies in Civil Engineering through industry-institute interaction and professional bodies
- M4: Environs to develop their innovative thoughts, ethics, communication, inter- and intra-personal skills
- M5: Enthusiasm towards self-learning, social responsibility and entrepreneurship

#### **Program Outcomes (POs):-**

At the time of their graduation students of Civil Engineering Program should be in possession of the following Program Outcomes

- PO 1. **Engineering knowledge:** Apply the knowledge of mathematics, science and engineering fundamentals for the solution of complex Civil Engineering problems.
- PO 2. **Problem analysis:** Identify, formulate and analyse complex Civil Engineering problems reaching substantiated conclusions using first principles of mathematics and engineering sciences.
- PO 3. **Design/development of solutions:** Design solutions for complex Civil Engineering problems and design system components with appropriate consideration for public health & safety, cultural, societal and environmental considerations.

- PO 4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis & interpretation of data and synthesis of the information to provide valid conclusions.
- PO 5. **Modern tool usage:** Create, select & apply appropriate techniques, resources, modern engineering and IT tools, including prediction and modeling to complex Civil Engineering activities, with an understanding of the limitations.
- PO 6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal & cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities as well as norms of the engineering practice.
- PO 9. **Individual and team work:** Function effectively as an individual, a member or leader in diverse teams and in multidisciplinary settings.
- PO 10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO 11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### **Program Educational Objectives (PEOs):-**

The following Program Educational Objectives are designed based on the department mission

- To apply knowledge of mathematics, science and engineering to solve existing problems in the area of Structural, Geotechnical, Water Resources, Environmental, Transportation, Urban Planning, Construction Materials and Management in Civil Engineering
- 2. To analyze, design, construct Civil Engineering traditional and modern structures

- 3. To perform investigation on any complicated Civil Engineering problems by conducting research using modern equipment's and software tools
- 4. To communicate and develop strong inter- and intra- personal skills to prepare them for placement and higher studies
- 5. To be self-motivated towards lifelong learning and entrepreneurship

## **Mapping of POs to PEOs**

| Program                | Program Outcomes |   |   |   |   |   |   |   |   |    |    |    |
|------------------------|------------------|---|---|---|---|---|---|---|---|----|----|----|
| Educational Objectives | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| PEO 1                  | 3                | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3  | 3  | 2  |
| PEO 2                  | 3                | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2  | 2  | 3  |
| PEO 3                  | 3                | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3  | 2  | 3  |
| PEO 4                  | 3                | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2  | 2  | 3  |
| PEO 5                  | 3                | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3  | 2  | 3  |

| 1 | Reasonably agreed | 2 | Moderately agreed | 3 | Strongly agreed | Ī |
|---|-------------------|---|-------------------|---|-----------------|---|
|---|-------------------|---|-------------------|---|-----------------|---|

## **Program Specific Outcomes (PSOs):-**

At the end of the Program, Graduate shall have

| PSO 1 | Analytical Knowledge   | The ability to analyse, design and interpret by applying |  |  |  |  |  |  |  |
|-------|------------------------|--|--|--|--|--|--|--|--|
|       | and Practical Skills   | the concepts of mathematics and physical sciences in     |  |  |  |  |  |  |  |
|       |                        | the core areas of Civil Engineering.                     |  |  |  |  |  |  |  |
| PSO 2 | Civil Engineer and     | The propensity to excel in portfolio of waste            |  |  |  |  |  |  |  |
|       | Sustainability         | management, sanitation, housing and construction         |  |  |  |  |  |  |  |
|       |                        | management for the sustainable environment.              |  |  |  |  |  |  |  |
| PSO 3 | <b>Environment and</b> | The ability to acquire and update knowledge              |  |  |  |  |  |  |  |
|       | Social Commitment      | continuously and offer engineering solutions to meet     |  |  |  |  |  |  |  |
|       |                        | the environmental and societal needs.                    |  |  |  |  |  |  |  |

# B.E. CIVIL ENGINEERING REGULATION 2022 (B: 2024-2028)

## I – VIII SEMESTER CURRICULUM AND SYLLABI

| SEME       | SEMESTER I     |   |    |   |    |                     |     |           |      |  |  |  |
|------------|----------------|---|----|---|----|---------------------|-----|-----------|------|--|--|--|
| SL.<br>No. | Course<br>Code | Course  | L  | Т | Р  | Contact<br>hrs./wk. | С   | Ext / Int | Cat. |  |  |  |
| 1          | 23CE101        | Introduction to Civil Engineering                                 | 3  | 0 | 0  | 3                   | 3   | 60/40     | HSMC |  |  |  |
| 2          | 23MA101        | Mathematics I   | 3  | 1 | 0  | 4                   | 4   | 60/40     | BSC  |  |  |  |
| 3          | 23EE113        | Fundamentals of Electrical and Electronics Engineering            | 2  | 1 | 0  | 3                   | 3   | 60/40     | ESC  |  |  |  |
| 4          | 23TA101        | Heritage of Tamils  | 1  | 0 | 0  | 1                   | 1   | 60/40     | IKS  |  |  |  |
| 5          | 23EN101        | Oral and Written Communication Skills                             | 2  | 0 | 2  | 4                   | 3   | 50/50     | HSMC |  |  |  |
| 6          | 23CS101        | Problem solving using C++   | 1  | 0 | 4  | 5                   | 3   | 50/50     | ESC  |  |  |  |
| 7          | 23CE103        | Design Thinking and Workshop Practices                            | 1  | 0 | 3  | 4                   | 2.5 | 50/50     | ESC  |  |  |  |
| 8          | 23CE102        | Engineering Graphics Laboratory                                   | 0  | 0 | 3  | 3                   | 1.5 | 40/60     | ESC  |  |  |  |
| 9          | 23EE115        | Fundamentals of Electrical and Electronics Engineering Laboratory | 0  | 0 | 2  | 2                   | 1   | 40/60     | ESC  |  |  |  |
| 10         | 23MC101        | Induction Programme<br>3 - weeks<br>(Mandatory Course -I)         |    |   |    |                     | 0   | 0/100     | MC   |  |  |  |
|            |                | Total   | 13 | 2 | 14 | 29                  | 22  | 1000      |      |  |  |  |

| SEMI       | ESTER II       |   |    |   |    |                     |    |           |      |
|------------|----------------|---|----|---|----|---------------------|----|-----------|------|
| SL.<br>No. | Course<br>Code | Course                                      | L  | Т | Р  | Contact<br>hrs./wk. | С  | Ext / Int | Cat. |
| 1          | 23MA204        | Calculus and Fourier<br>Series              | 3  | 1 | 0  | 4                   | 4  | 60/40     | BSC  |
| 2          | 23CE206        | Principles of Engineering Mechanics         | 3  | 1 | 0  | 4                   | 4  | 60/40     | BSC  |
| 3          | 23CE202        | Construction Materials and Techniques       | 3  | 0 | 0  | 3                   | 3  | 60/40     | ESC  |
| 4          | 23PS101        | Physical Sciences                           | 4  | 0 | 0  | 4                   | 4  | 60/40     | BSC  |
| 5          | 23TA201        | Tamils and Technology                       | 1  | 0 | 0  | 1                   | 1  | 60/40     | IKS  |
| 6          | 23CE205        | Architectural Design Principles and Drawing | 3  | 0 | 2  | 5                   | 4  | 50/50     | ESC  |
| 7          | 23IT211        | Introduction to Python Programming          | 1  | 0 | 4  | 5                   | 3  | 50/50     | ESC  |
| 8          | 23PS102        | Physical Science<br>Laboratory              | 0  | 0 | 4  | 4                   | 2  | 40/60     | BSC  |
|            |                | Total                                       | 18 | 2 | 10 | 30                  | 25 | 800       |      |

| SEME       | SEMESTER III   |  |    |   |   |                     |      |           |      |  |  |  |
|------------|----------------|--|----|---|---|---------------------|------|-----------|------|--|--|--|
| SL.<br>No. | Course<br>Code | Course                                       | L  | Т | Р | Contact<br>hrs./wk. |      | Ext / Int | Cat. |  |  |  |
| 1          | 23MA303        | Numerical Methods                            |    | 1 | 0 | 4                   | 4    | 60/40     | BSC  |  |  |  |
| 2          | 23CE301        | Fluid Mechanics and<br>Hydraulic Engineering |    | 0 | 0 | 3                   | 3    | 60/40     | PCC  |  |  |  |
| 3          | 23CE302        | Solid Mechanics                              | 3  | 1 | 0 | 4                   | 4    | 60/40     | PCC  |  |  |  |
| 4          | 23CE303        | Surveying and Geomatics                      | 3  | 0 | 0 | 3                   | 3    | 60/40     | PCC  |  |  |  |
| 5          | 23GE301        | Universal Human Values                       | 3  | 0 | 0 | 3                   | 3    | 60/40     | HSMC |  |  |  |
| 6          | 23CE304        | Fluid Mechanics Laboratory                   | 0  | 0 | 3 | 3                   | 1.5  | 40/60     | PCC  |  |  |  |
| 7          | 23CE305        | Solid Mechanics Laboratory                   | 0  | 0 | 3 | 3                   | 1.5  | 40/60     | PCC  |  |  |  |
| 8          | 23CE306        | Surveying and Geomatics<br>Laboratory        | 0  | 0 | 3 | 3                   | 1.5  | 40/60     | PCC  |  |  |  |
| 9          | 23MCxxx        | Mandatory Course II                          | 2  | 0 | 0 | 2                   | 0    | 0/100     | MC   |  |  |  |
|            |                | Total  | 17 | 2 | 9 | 28                  | 21.5 | 900       |      |  |  |  |

| SEMI       | ESTER IV       |  |    |                         |                         |                         |     |                      |      |
|------------|----------------|--|----|-------------------------|-------------------------|-------------------------|-----|----------------------|------|
| SL.<br>No. | Course<br>Code | Course   | L  | Т                       | Р                       | Contact<br>hrs./wk.     | С   | Ext / Int            | Cat. |
| 1          | 23CE401        | Concrete Technology  | 3  | 0                       | 0                       | 3                       | 3   | 60/40                | PCC  |
| 2          | 23CE402        | Environmental Engineering  | 3  | 0                       | 0                       | 3                       | 3   | 60/40                | PCC  |
| 3          | 23CE403        | Structural Analysis  | 3  | 1                       | 0                       | 4                       | 4   | 60/40                | PCC  |
| 4          | 23CE404        | Transportation Engineering   | 3  | 0                       | 0                       | 3                       | 3   | 60/40                | PCC  |
| 5          | 23ххууу        | Open Elective I  |    | 0<br>or<br>0<br>or<br>0 | 0<br>or<br>4<br>or<br>6 | 3<br>or<br>5<br>or<br>6 | 3   | 60/40<br>or<br>40/60 | OEC  |
| 6          | 23CE405        | Concrete and Highway Engineering Laboratory                              | 0  | 0                       | 4                       | 4                       | 2   | 40/60                | PCC  |
| 7          | 23CE406        | Environmental Engineering Laboratory                                     | 0  | 0                       | 3                       | 3                       | 1.5 | 40/60                | PCC  |
| 8          | 23CE407        | Structural Analysis<br>Laboratory  | 0  | 0                       | 3                       | 3                       | 1.5 | 40/60                | PCC  |
| 9          | 23EES101       | Employability Enhancement<br>Skills (Internship / Training<br>– 2 weeks) | 0  | 0                       | 0                       | 0                       | 1   | 40/60                | EES  |
| 10         | 23MCxxx        | Mandatory Course III   | 2  | 0                       | 0                       | 2                       | 0   | 0/100                | MC   |
|            |                | Total  | 17 | 1                       | 10                      | 28                      | 22  | 1000                 |      |

| SEME       | SEMESTER V     |   |                         |                         |                         |                         |     |                      |      |  |  |  |  |
|------------|----------------|---|-------------------------|-------------------------|-------------------------|-------------------------|-----|----------------------|------|--|--|--|--|
| SL.<br>No. | Course<br>Code | Course  | L                       | Т                       | Р                       | Contact<br>hrs./wk.     | С   | Ext / Int            | Cat. |  |  |  |  |
| 1          | 23CE501        | Design of Reinforced<br>Concrete Elements                                   | 3                       | 1                       | 0                       | 4                       | 4   | 60/40                | PCC  |  |  |  |  |
| 2          | 23CE502        | Geotechnical Engineering  | 3                       | 1                       | 0                       | 4                       | 4   | 60/40                | PCC  |  |  |  |  |
| 3          | 23CE503        | Intelligent transportation system   | 3                       | 0                       | 0                       | 3                       | 3   | 60/40                | PCC  |  |  |  |  |
| 4          | 23CExxx        | Professional Elective I   | 3                       | 0                       | 0                       | 3                       | 3   | 60/40                | PEC  |  |  |  |  |
| 5          | 23ххууу        | Open Elective II  | 3<br>or<br>1<br>or<br>0 | 0<br>or<br>0<br>or<br>0 | 0<br>or<br>4<br>or<br>6 | 3<br>or<br>5<br>or<br>6 | 3   | 60/40<br>or<br>40/60 | OEC  |  |  |  |  |
| 6          | 23CE504        | Design of RC Structures<br>Laboratory                                       | 0                       | 0                       | 3                       | 3                       | 1.5 | 40/60                | PCC  |  |  |  |  |
| 7          | 23CE505        | Geotechnical Laboratory   | 0                       | 0                       | 3                       | 3                       | 1.5 | 40/60                | PCC  |  |  |  |  |
| 8          | 23EES102       | Employability<br>Enhancement Skills<br>(Internship / Training – 2<br>weeks) | 0                       | 0                       | 0                       | 0                       | 1   | 40/60                | EES  |  |  |  |  |
| 9          | 23MCxxx        | Mandatory Course – IV   | 2                       | 0                       | 0                       | 2                       | 0   | 0/100                | MC   |  |  |  |  |
|            |                | Total   | 17                      | 2                       | 6                       | 25                      | 21  | 900                  |      |  |  |  |  |

| SEMI       | ESTER VI       |  |    |   |   |                     |     |           |      |
|------------|----------------|--|----|---|---|---------------------|-----|-----------|------|
| SL.<br>No. | Course<br>Code | Course                                   | L  | Т | Р | Contact<br>hrs./wk. | С   | Ext / Int | Cat. |
| 1          | 23CE601        | Construction Planning and Management     | 3  | 0 | 0 | 3                   | 3   | 60/40     | PCC  |
| 2          | 23CE602        | Design of Steel Structural Elements      | 3  | 1 | 0 | 4                   | 4   | 60/40     | PCC  |
| 3          | 23CE603        | Foundation Engineering                   | 3  | 0 | 0 | 3                   | 3   | 60/40     | PCC  |
| 4          | 23CExxx        | Open Elective III                        | 3  | 0 | 0 | 3                   | 3   | 60/40     | OEC  |
| 5          | 23Cexxx        | Professional Elective II                 | 3  | 0 | 0 | 3                   | 3   | 60/40     | PEC  |
| 6          | 23Cexxx        | Professional Elective III                | 3  | 0 | 0 | 3                   | 3   | 60/40     | EEC  |
| 7          | 23CE604        | Design of Steel Structures<br>Laboratory | 0  | 0 | 3 | 3                   | 1.5 | 40/60     | PCC  |
| 8          | 23CE605        | Project Planning<br>Laboratory           | 0  | 0 | 3 | 3                   | 1.5 | 40/60     | PCC  |
|            |                | Total                                    | 18 | 1 | 6 | 25                  | 22  | 800       |      |

| SEME       | SEMESTER VII   |   |    |   |   |                     |      |           |      |  |  |  |
|------------|----------------|---|----|---|---|---------------------|------|-----------|------|--|--|--|
| SL.<br>No. | Course<br>Code | Course  | L  | Т | Р | Contact<br>hrs./wk. |      | Ext / Int | Cat. |  |  |  |
| 1          | 23CE701        | Construction Cost<br>Estimation and Valuation         | 3  | 1 | 0 | 4                   | 4    | 60/40     | PCC  |  |  |  |
| 2          | 23CE702        | Sustainable and Green Construction                    | 3  | 0 | 0 | 3                   | 3    | 60/40     | PCC  |  |  |  |
| 3          | 23Cexxx        | Open Elective IV                                      | 3  | 0 | 0 | 3                   | 3    | 60/40     | OEC  |  |  |  |
| 4          | 23Cexxx        | Professional Elective IV                              | 3  | 0 | 0 | 3                   | 3    | 60/40     | PEC  |  |  |  |
| 5          | 23Cexxx        | Professional Elective V                               | 3  | 0 | 0 | 3                   | 3    | 60/40     | PEC  |  |  |  |
| 6          | 23Cexxx        | Professional Elective VI                              | 3  | 0 | 0 | 3                   | 3    | 60/40     | PEC  |  |  |  |
| 7          | 23CE703        | Construction Cost Estimation and Valuation Laboratory |    | 0 | 3 | 3                   | 1.5  | 40/60     | PCC  |  |  |  |
| 8          | 23CE704        | Design Comprehensive Project                          | 0  | 0 | 4 | 4                   | 2    | 40/60     | PROJ |  |  |  |
|            |                | Total   | 18 | 1 | 7 | 26                  | 22.5 | 800       |      |  |  |  |

| SEME       | SEMESTER VIII  |              |   |   |    |                  |    |           |      |  |  |  |
|------------|----------------|--------------|---|---|----|------------------|----|-----------|------|--|--|--|
| SL.<br>No. | Course<br>Code | Course       | ٦ | Т | P  | Contact hrs./wk. |    | Ext / Int | Cat. |  |  |  |
| 1.         | 23CE801        | Project Work | 0 | 0 | 24 | 24               | 12 | 40/60     | PROJ |  |  |  |
|            |                | Total        | 0 | 0 | 24 | 24               | 12 | 100       |      |  |  |  |

L: Lecture T: Tutorial P: Practical C: Credit Cat.: Category

**HSMC**: Humanities and Social : Open Elective Courses OEC

: Emerging Elective Courses Sciences including Management EEC **BSC**: Basic Science Courses IKS : Indian Knowledge System

: Engineering Science Courses **PROJ**: Project Work **ESC PCC**: Professional Core Courses MC : Mandatory Course

**PEC**: Professional Elective Courses

#### **Definition of Credit:**

L – Lecture 1 Hr. Lecture (L) per week 1 credit T – Tutorial 1 Hr. Tutorial (T) per week 1 credit P – Practical/Practice (Project and Industry based 1 Hr. Practical (P) per week 0.5 credit

Courses)

### **SEMESTER WISE CREDIT DISTRIBUTION: -**

| Semester | I  | II | III  | IV | V  | VI | VII  | VIII | Total |
|----------|----|----|------|----|----|----|------|------|-------|
| Credits  | 22 | 25 | 21.5 | 22 | 21 | 22 | 22.5 | 12   | 168   |

**Total Credits: 168** 

## **SCHEME OF CREDIT DISTRIBUTION – SUMMARY**

| SL. | Stream   |    | Credits/Semester |      |    |    |    |      |      |         |
|-----|--|----|------------------|------|----|----|----|------|------|---------|
| No. | Stream   |    | II               | III  | IV | ٧  | VI | VII  | VIII | Credits |
| 1.  | Humanities & SocialSciences Including Management (HSMC)      | 6  |                  | 3    |    |    |    |      |      | 9       |
| 2.  | Basic Sciences (BSC)   | 4  | 14               | 4    |    |    |    |      |      | 22      |
| 3.  | Engg. Sciences (ESC)   | 11 | 10               |      |    |    |    |      |      | 21      |
| 4.  | Professional Core (PCC)                                      |    |                  | 14.5 | 18 | 14 | 13 | 8.5  |      | 68      |
| 5.  | Professional Electives (PEC)                                 |    |                  |      |    | 3  | 6  | 9    |      | 18      |
| 6.  | Multidisciplinary Open Electives<br>Courses (OEC)            |    |                  |      | 3  | 3  | 3  | 3    |      | 12      |
| 7.  | Project Work (PROJ) / Employability Enhancement Skills (EES) |    |                  |      | 1  | 1  |    | 2    | 12   | 16      |
| 8.  | Indian Knowledge System (IKS)                                | 1  | 1                |      |    |    |    |      |      | 2       |
| 9.  | Mandatory Course (MC)  | 0  |                  | 0    | 0  | 0  |    |      |      | 0       |
|     | Total  | 22 | 25               | 21.5 | 22 | 21 | 22 | 22.5 | 12   | 168     |

## STRUCTURE FOR UNDERGRADUATE ENGINEERING PROGRAMME

| SL.<br>No. | Course Work – Subject Area   | AICTE<br>Suggested<br>Breakdown of<br>Credits | Civil-SKCET<br>Credits |
|------------|--|---|------------------------|
| 1.         | Humanities and Social Sciencesincluding Management courses   | 06  | 9                      |
| 2.         | Basic Science courses  | 24  | 22                     |
| 3.         | Engineering Science courses including Workshop,<br>Drawing, Basics of Electrical / Mechanical / Computer<br>etc. | 20  | 21                     |
| 4.         | Professional core courses  | 62  | 68                     |
| 5.         | Professional Electives courses relevant to the chosen specialization / branch                                    | 26  | 18                     |
| 6.         | Multidisciplinary Open Electives Courses (OEC)   | 12  | 12                     |
| 7.         | Project Work, Seminar and / orInternship in Industry or elsewhere.   | 46  | 14                     |
| 8.         | Industrial Practice / Employability EnhancementSkills  | 16  | 2                      |
| 9.         | Indian Knowledge System  | 2   | 2                      |
| 10.        | Mandatory Courses  | Non-credit                                    | Non-credit             |
|            | Total  | 168   | 168                    |

**HUMANITIES & SOCIAL SCIENCES INCLUDING MANAGEMENT (9 Credits)** 

| SL.<br>NO | Course<br>Code | Course                                | L | Т | Р | Contact<br>hrs./Wk. | С | Cat. |
|-----------|----------------|---------------------------------------|---|---|---|---------------------|---|------|
| 1         | 23CE101        | Introduction to Civil Engineering     | 3 | 0 | 0 | 3                   | 3 | HSMC |
| 2         | 23EN101        | Oral and Written Communication Skills | 2 | 0 | 2 | 4                   | 3 | HSMC |
| 3         | 23GE301        | Universal Human Values                | 3 | 0 | 0 | 3                   | 3 | HSMC |

**BASIC SCIENCE COURSES (22 Credits)** 

| SL.<br>NO | Course<br>Code | Course                              | L | T | Р | Contact hrs./Wk. | С | Cat. |
|-----------|----------------|-------------------------------------|---|---|---|------------------|---|------|
| 1         | 23MA101        | Mathematics I                       | 3 | 1 | 0 | 4                | 4 | BSC  |
| 2         | 23PS101        | Physical Sciences                   | 4 | 0 | 0 | 4                | 4 | BSC  |
| 3         | 23PS102        | Physical Science Laboratory         | 0 | 0 | 4 | 4                | 2 | BSC  |
| 4         | 23MA204        | Calculus and Fourier Series         | 3 | 1 | 0 | 4                | 4 | BSC  |
| 5         | 23CE206        | Principles of Engineering Mechanics | 3 | 1 | 0 | 4                | 4 | BSC  |
| 6         | 23MA303        | Numerical Methods                   | 3 | 1 | 0 | 4                | 4 | BSC  |

# **ENGINEERING SCIENCE COURSES (21 Credits)**

| SL.<br>NO | Course<br>Code | Course  | L | Т | Р | Contact hrs./Wk. | С   | Cat. |
|-----------|----------------|---|---|---|---|------------------|-----|------|
| 1         | 23EE113        | Fundamentals of Electrical and Electronics Engineering            | 2 | 1 | 0 | 3                | 3   | ESC  |
| 2         | 23CS101        | Problem solving using C++   | 1 | 0 | 4 | 5                | 3   | ESC  |
| 3         | 23EE115        | Fundamentals of Electrical and Electronics Engineering Laboratory | 0 | 0 | 2 | 2                | 1   | ESC  |
| 4         | 23CE102        | Engineering Graphics Laboratory                                   | 0 | 0 | 3 | 3                | 1.5 | ESC  |
| 8         | 23CE103        | Design Thinking and Workshop Practices                            | 1 | 0 | 3 | 4                | 2.5 | ESC  |
| 5         | 23CE202        | Construction Materials and Techniques                             | 3 | 0 | 0 | 3                | 3   | ESC  |
| 6         | 23CE205        | Architectural Design Principles and Drawing                       | 3 | 0 | 2 | 5                | 4   | ESC  |
| 7         | 23IT211        | Introduction to Python Programming                                | 1 | 0 | 4 | 5                | 3   | ESC  |

# INDIAN KNOWLEDGE SYSTEM (2 Credits)

| SL.<br>NO | Course<br>Code | Course                | L | Т | Р | Contact hrs./Wk. | С | Cat. |
|-----------|----------------|-----------------------|---|---|---|------------------|---|------|
| 1.        | 23TA101        | Heritage of Tamils    | 1 | 0 | 0 | 1                | 1 | IKS  |
| 2.        | 23TA201        | Tamils and Technology | 1 | 0 | 0 | 1                | 1 | IKS  |

# PROFESSIONAL CORE COURSES (68 Credits)

| SL.<br>NO | Course<br>Code | Course  | L | Т | P | Contact hrs./Wk. | С   | Cat. |
|-----------|----------------|---|---|---|---|------------------|-----|------|
| 1         | 23CE301        | Fluid Mechanics and Hydraulic<br>Engineering          | 3 | 0 | 0 | 3                | 3   | PCC  |
| 2         | 23CE302        | Solid Mechanics                                       | 3 | 1 | 0 | 4                | 4   | PCC  |
| 3         | 23CE303        | Surveying and Geomatics                               | 3 | 0 | 0 | 3                | 3   | PCC  |
| 4         | 23CE304        | Fluid Mechanics Laboratory                            | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 5         | 23CE305        | Solid Mechanics Laboratory                            | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 6         | 23CE306        | Surveying and Geomatics<br>Laboratory                 | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 7         | 23CE401        | Concrete Technology                                   | 3 | 0 | 0 | 3                | 3   | PCC  |
| 8         | 23CE402        | Environmental Engineering                             | 3 | 0 | 0 | 3                | 3   | PCC  |
| 9         | 23CE403        | Structural Analysis                                   | 3 | 1 | 0 | 4                | 4   | PCC  |
| 10        | 23CE404        | Transportation Engineering                            | 3 | 0 | 0 | 3                | 3   | PCC  |
| 11        | 23CE405        | Concrete and Highway Engineering Laboratory           | 0 | 0 | 4 | 4                | 2   | PCC  |
| 12        | 23CE406        | Environmental Engineering<br>Laboratory               | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 13        | 23CE407        | Structural Analysis Laboratory                        | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 14        | 23CE501        | Design of Reinforced Concrete<br>Elements             | 3 | 1 | 0 | 4                | 4   | PCC  |
| 15        | 23CE502        | Geotechnical Engineering                              | 3 | 1 | 0 | 4                | 4   | PCC  |
| 16        | 23CE503        | Intelligent transportation system                     | 3 | 0 | 0 | 3                | 3   | PCC  |
| 17        | 23CE504        | Design of RC Structures Laboratory                    | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 18        | 23CE505        | Geotechnical Laboratory                               | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 19        | 23CE601        | Construction Planning and Management                  | 3 | 0 | 0 | 3                | 3   | PCC  |
| 20        | 23CE602        | Design of Steel Structural<br>Elements                | 3 | 1 | 0 | 4                | 4   | PCC  |
| 21        | 23CE603        | Foundation Engineering                                | 3 | 0 | 0 | 3                | 3   | PCC  |
| 22        | 23CE604        | Design of Steel Structures Laboratory                 | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 23        | 23CE605        | Project Planning Laboratory                           | 0 | 0 | 3 | 3                | 1.5 | PCC  |
| 24        | 23CE701        | Construction Cost Estimation and Valuation            | 3 | 1 | 0 | 4                | 4   | PCC  |
| 25        | 23CE702        | Sustainable and Green Construction                    | 3 | 0 | 0 | 3                | 3   | PCC  |
| 26        | 23CE703        | Construction Cost Estimation and Valuation Laboratory | 0 | 0 | 3 | 3                | 1.5 | PCC  |

## PROFESSIONAL ELECTIVE COURSES - VERTICALS

| Vertical I  | Vertical II                                     | Vertical III   | Vertical IV  | Vertical V   | Vertical VI  |
|---|---|--|--|--|--|
| Structural<br>Engineering                               | Geotechnical<br>Engineering                     | Construction<br>Management   | Environmental<br>Engineering                                     | Infrastructures<br>Engineering                                 | Diversified<br>Courses                                     |
| Conditional Assessment and Rehabilitation of Structures | Soil Dynamics and<br>Earthquake<br>Engineering  | Project<br>Formulation and<br>Implementation                           | Air and Noise<br>Pollution                                       | Computer Simulation Applications in Transportation Engineering | Plumbing (Water and Sanitation)                            |
| Design of RC<br>Structures                              | Ground<br>Improvement and<br>Geosynthetics      | Construction Personnel Management                                      | Industrial<br>Wastewater<br>Treatment System                     | Smart City<br>Planning and<br>Development                      | Applications of<br>Sensors and IoT in<br>Civil Engineering |
| Finite Element<br>Analysis                              | Environmental<br>Geotechnics                    | Lean and<br>Sustainable<br>Construction                                | Rural Water<br>Supply and Onsite<br>Sanitation<br>Systems        | Metro Rail<br>Engineering and<br>Infrastructure                | Building Services and Management                           |
| Pre-stressed<br>Concrete<br>Structures                  | Surface Water<br>Hydrology                      | Construction<br>Method and<br>Equipment<br>Management                  | Irrigation and water resources engineering                       | Remote Sensing<br>and GIS for Civil<br>Engineering             | Valuation of Real<br>Properties                            |
| Design of Steel<br>Structures                           | Assessment of Contaminated Site and Remediation | Supply Chain Management and Logistics in Construction                  | Ground water and surface water pollution                         | Smart<br>Construction<br>Materials and<br>Techniques           | Nanotechnology in<br>Civil Engineering                     |
| Prefabricated<br>Structures                             | Design of<br>Substructures                      | Risk and Reliability<br>Analysis of Civil<br>Infrastructure<br>Systems | Solid and<br>Hazardous Waste<br>Management                       | Highway<br>Pavement Design<br>and Evaluation                   | Airport and<br>Harbour<br>Engineering                      |
| Advanced<br>Structural Analysis                         | Seismic Design of<br>Structures                 | Formwork<br>Engineering  | Environmental<br>impact<br>Assessment and<br>Life Cycle Analysis | Coastal<br>Engineering   | Robotics and<br>Automation in<br>Civil Engineering         |

# **PROFESSIONAL ELECTIVE COURSES (18 Credits)**

| 23CE901<br>23CE902<br>23CE903<br>23CE904<br>23CE905<br>23CE906<br>23CE907 | Vertical I: Structural Engineering Conditional Assessment and Rehabilitation of Structures Design of RC Structures Finite Element Analysis Pre-stressed Concrete Structures Design of Steel Structures Prefabricated Structures Advanced Structural Analysis | 3/0/0<br>3/0/0<br>3/0/0<br>3/0/0<br>3/0/0<br>3/0/0<br>3/0/0  | 3<br>3<br>3<br>3<br>3<br>3   | 3<br>3<br>3<br>3<br>3  | PEC PEC PEC PEC  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|
| 23CE902<br>23CE903<br>23CE904<br>23CE905<br>23CE906<br>23CE907            | Structures  Design of RC Structures  Finite Element Analysis  Pre-stressed Concrete Structures  Design of Steel Structures  Prefabricated Structures  Advanced Structural Analysis   | 3/0/0<br>3/0/0<br>3/0/0<br>3/0/0<br>3/0/0  | 3<br>3<br>3<br>3<br>3  | 3 3 3  | PEC<br>PEC<br>PEC  |  |  |  |  |  |  |
| 23CE903<br>23CE904<br>23CE905<br>23CE906<br>23CE907                       | Finite Element Analysis Pre-stressed Concrete Structures Design of Steel Structures Prefabricated Structures Advanced Structural Analysis  | 3/0/0<br>3/0/0<br>3/0/0<br>3/0/0   | 3 3 3 3  | 3 3  | PEC<br>PEC   |  |  |  |  |  |  |
| 23CE904<br>23CE905<br>23CE906<br>23CE907                                  | Pre-stressed Concrete Structures  Design of Steel Structures  Prefabricated Structures  Advanced Structural Analysis   | 3/0/0<br>3/0/0<br>3/0/0  | 3<br>3<br>3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE905<br>23CE906<br>23CE907<br>23CE908                                  | Design of Steel Structures Prefabricated Structures Advanced Structural Analysis   | 3/0/0  | 3  | 3  | _  |  |  |  |  |  |  |
| 23CE906<br>23CE907<br>23CE908   | Prefabricated Structures Advanced Structural Analysis  | 3/0/0  | 3  |  | PEC  |  |  |  |  |  |  |
| 23CE907<br>23CE908  | Advanced Structural Analysis   |  |  | 3  |  |  |  |  |  |  |  |
| 23CE908   | •  | 3/0/0  | 2  |  | PEC  |  |  |  |  |  |  |
|   | Vertical II: Geotechnical Engineeri  |  | 3  | 3  | PEC  |  |  |  |  |  |  |
|   | Vertical II: Geotechnical Engineering  |  |  |  |  |  |  |  |  |  |  |
|   | Soil Dynamics and Earthquake Engineering   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE909   | Ground Improvement and Geosynthetics   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE910   | Environmental Geotechnics  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE911   | Surface Water Hydrology  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE912   | Assessment of Contaminated Site and Remediation  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE913   | Design of Substructures  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE914   | Seismic Design of Structures   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
|   | Vertical III: Construction Managem   | ent  |  |  |  |  |  |  |  |  |  |
| 23CE915   | Project Formulation and Implementation   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE916   | Construction Personnel Management  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE917   | Lean and Sustainable Construction  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE918   | Construction Method and Equipment Management   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE919   | Supply Chain Management and Logistics in Construction  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE920   | Risk and Reliability Analysis of Civil Infrastructure Systems  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE921   | Formwork Engineering   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
|   | Vertical IV: Environmental Enginee   | ring   |  |  | -  |  |  |  |  |  |  |
| 23CE922   | Air and Noise Pollution  | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE923   | Industrial Wastewater Treatment System   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 23CE024   | Rural Water Supply and Onsite Sanitation Systems   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 2302924   | Irrigation and water resources engineering   | 3/0/0  | 3  | 3  | PEC  |  |  |  |  |  |  |
| 2:  | 3CE918<br>3CE919<br>3CE920<br>3CE921   | Construction Method and Equipment Management  SCE919 Supply Chain Management and Logistics in Construction  Risk and Reliability Analysis of Civil Infrastructure Systems  CE921 Formwork Engineering  Vertical IV: Environmental Enginee  CE922 Air and Noise Pollution  CE923 Industrial Wastewater Treatment System  CE924 Rural Water Supply and Onsite Sanitation Systems | Construction Method and Equipment Management  SCE919 Supply Chain Management and Logistics in Construction  Risk and Reliability Analysis of Civil Infrastructure Systems  Cep21 Formwork Engineering  Vertical IV: Environmental Engineering  CE922 Air and Noise Pollution  CE923 Industrial Wastewater Treatment System  CE924 Rural Water Supply and Onsite Sanitation Systems | Construction Method and Equipment Management  SCE919 Supply Chain Management and Logistics in Construction  Risk and Reliability Analysis of Civil 3/0/0 3 Infrastructure Systems  Cep21 Formwork Engineering 3/0/0 3  Vertical IV: Environmental Engineering  CE922 Air and Noise Pollution 3/0/0 3  CE923 Industrial Wastewater Treatment System 3/0/0 3  CE924 Rural Water Supply and Onsite Sanitation Systems | Construction Method and Equipment Management Supply Chain Management and Logistics in Construction Risk and Reliability Analysis of Civil Infrastructure Systems Suce Pormwork Engineering Suce Pollution |  |  |  |  |  |  |

| 26. | 23CE926 | Ground water and surface water pollution                          | 3/0/0 | 3 | 3 | PEC |
|-----|---------|---|-------|---|---|-----|
| 27. | 23CE927 | Solid and Hazardous Waste Management                              | 3/0/0 | 3 | 3 | PEC |
| 28. | 23CE928 | Environmental impact Assessment and Life Cycle Analysis           | 3/0/0 | 3 | 3 | PEC |
|     |         | Vertical V :Infrastructures Enginee                               | ring  |   |   |     |
| 29. | 23CE929 | Computer Simulation Applications in<br>Transportation Engineering | 3/0/0 | 3 | 3 | PEC |
| 30. | 23CE930 | Smart City Planning and Development                               | 3/0/0 | 3 | 3 | PEC |
| 31. | 23CE931 | Metro Rail Engineering and Infrastructure                         | 3/0/0 | 3 | 3 | PEC |
| 32. | 23CE932 | Remote Sensing and GIS for Civil Engineering                      | 3/0/0 | 3 | 3 | PEC |
| 33. | 23CE933 | Smart Construction Materials and Techniques                       | 3/0/0 | 3 | 3 | PEC |
| 34. | 23CE934 | Highway Pavement Design and Evaluation                            | 3/0/0 | 3 | 3 | PEC |
| 35. | 23CE935 | Coastal Engineering   | 3/0/0 | 3 | 3 | PEC |
|     |         | Vertical VI : Diversified Courses                                 | 3     |   |   |     |
| 36. | 23CE936 | Plumbing (Water and Sanitation)                                   | 3/0/0 | 3 | 3 | PEC |
| 37. | 23CE937 | Applications of Sensors and IoT in Civil Engineering              | 3/0/0 | 3 | 3 | PEC |
| 38. | 23CE938 | Building Services and Management                                  | 3/0/0 | 3 | 3 | PEC |
| 39. | 23CE939 | Valuation of Real Properties                                      | 3/0/0 | 3 | 3 | PEC |
| 40. | 23CE940 | Nanotechnology in Civil Engineering                               | 3/0/0 | 3 | 3 | PEC |
| 41. | 23CE941 | Airport and Harbour Engineering                                   | 3/0/0 | 3 | 3 | PEC |
| 42. | 23CE942 | Robotics and Automation in Civil Engineering                      | 3/0/0 | 3 | 3 | PEC |

# PROJECT WORK (14 Credits)

| SL.<br>No. | Course<br>Code | Course Title                 | L/T/P  | Contact hrs./Wk. | C  | Cat. |
|------------|----------------|------------------------------|--------|------------------|----|------|
| 1.         | 23CE704        | Design Comprehensive Project | 0/0/4  | 4                | 2  | PROJ |
| 2.         | 23CE801        | Project Work                 | 0/0/24 | 24               | 12 | PROJ |

# **EMPLOYABILITY ENHANCEMENT SKILLS (2 Credits)**

| SL.<br>No. | Course<br>Code | Course Title   | Duration | С | Cat. |
|------------|----------------|--|----------|---|------|
| 1.         | 23EES101       | Employability Enhancement Skills (Internship / Training) | 2 Weeks  | 1 | EES  |
| 2.         | 23EES102       | Employability Enhancement Skills (Internship / Training) | 2 Weeks  | 1 | EES  |

# **MANDATORY COURSES (Non-credit)**

| SL.<br>No. | Course<br>Code | Course Title                                   | L/T/P   | Contact hrs./Wk. | С | Cat. |
|------------|----------------|--|---------|------------------|---|------|
| 1.         | 23MC101        | Induction Programme                            | 3 WEEKS |                  | 0 | MC   |
| 2.         | 23MC102        | Environmental Sciences                         | 2/0/0   | 2                | 0 | MC   |
| 3.         | 23MC104        | Management Organizational Behavior             | 2/0/0   | 2                | 0 | MC   |
| 4.         | 23MC112        | Civil Engineering – Societal & Global Impact   | 2/0/0   | 2                | 0 | MC   |
| 5.         | 23MC113        | Professional Practice, Law & Ethics            | 2/0/0   | 2                | 0 | MC   |
| 6.         | 23MC114        | Disaster Mitigation and Management             | 2/0/0   | 2                | 0 | MC   |
| 7.         | 23MC115        | Disability, Accessibility and Universal Design | 2/0/0   | 2                | 0 | MC   |

# **OPEN ELECTIVE COURSES (6 Credits)** [Offered to Other Branches]

| SL.<br>No. | Course<br>Code | Course Title                              | L/T/P | Contact hrs./Wk. | С   | Cat. |
|------------|----------------|---|-------|------------------|-----|------|
| 1.         | 23CE001        | Disaster Management 3/0/0 3               |       | 3                | OEC |      |
| 2.         | 23CE002        | Engineering Risk and Uncertainty          | 3/0/0 | 3                | 3   | OEC  |
| 3.         | 23CE003        | Environmental Pollution and Global issues | 3/0/0 | 3                | 3   | OEC  |
| 4.         | 23CE004        | Project Management                        | 3/0/0 | 3                | 3   | OEC  |
| 5.         | 23CE005        | Industrial Safety                         | 3/0/0 | 3                | 3   | OEC  |
| 6.         | 23CE006        | Research Methodology and IPR              | 3/0/0 | 3                | 3   | OEC  |

# **VALUE ADDED COURSES (Additional credit courses)**

| SL.<br>No. | Course Code | Course Title                                   | Course<br>Credits |
|------------|-------------|--|-------------------|
| 1.         | 23VA130     | Effective Communication Skills                 | 1                 |
| 2.         | 23VA101     | Building Functional Design using AutoCAD       | 1                 |
| 3.         | 23VA102     | Total Station and GPS Surveying                | 1                 |
| 4.         | 23VA103     | Arc GIS for Civil Engineers                    | 1                 |
| 5.         | 23VA104     | Structural Analysis and Design Using STAAD.Pro | 1                 |
| 6.         | 23VA105     | Project Management Using Primavera             | 1                 |
| 7.         | 23VA106     | 3DBuilding Modeling Using Revit Architecture   | 1                 |
| 8.         | 23VA107     | Building Valuation                             | 1                 |