**Introduction**

The course requirement and the schedule of courses for undergraduate students of the Department of Civil and Water Resources Engineering are given below. The two to four letter prefix in any course number indicates the department offering the course viz. CWRE for Civil and Water Resources Engineering, CE for Civil Engineering, EEE for Electrical and Electronic Engineering, Chem for Chemistry, Phy for Physics, Math for Mathematics, Hum for Humanities. The first of the three digits of the course number indicates the year/level for which the course is intended, the second digit is reserved for departmental use and the last digit being odd for theory courses and even for sessional courses.

**Course Requirements**

**Summary of Course Requirements for Bachelor Degree in CWRE**

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| --- | --- | --- |
|  | **Courses** | **Requirement (Credits)** |
| **A** | Basic Sciences | **9** |
| **B** | Mathematics | **12** |
| **C** | Humanities | **9** |
| **D** | Basic Engineering | **45** |
| **E** | Engineering Practices | **6** |
| **F** | Water Resources Engineering | **32.5** |
| **G** | Structural Engineering | **20.5** |
| **H** | Geotechnical Engineering | **8.5** |
| **I** | Environmental Engineering | **7.5** |
| **J** | Transportation Engineering | **5.5** |
| **Total** | **155.5** |
|  | Thesis | **4.5** |
| **Grand Total** | **160** |

**Credit Distribution in Different Levels and Terms**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Level -1 | Term- 1 | 20.5 | 39 |  **Total****160** |
| Term- 2 | 18.5 |
| Level -2 | Term- 1 | 20.5 | 39 |
| Term- 2 | 18.5 |
| Level -3 | Term-1 | 21.5 | 41 |
| Term-2 | 19.5 |
| Level -4 | Term-1 | 22.0 | 41 |
| Term-2 | 19.0 |

**Course Structure**

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| --- |
| **Basic Science (Credit requirement 6+3 = 9)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| Phy-105  | Physic | 3 |  |
| Chem-105 | Chemistry | 3 |  |
| Phy-108 | Physic Sessional | 1.5 |  |
| Chem-106 | Chemistry Sessional | 1.5 |  |

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| **Mathematic (Credit requirement = 12)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks** |
| Math-105 | Differential and Integral Calculus | 3 |  |
| Math-107 | Matrices and Solid Geometry | 3 |  |
| Math-205 | Differential Equations | 3 |  |
| Math-207 | Vector calculus, Statistics and Harmonics | 3 |  |
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| **Humanities (Credit requirement 9)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| Hum-105 | English | 3 |  |
| Hum-107 | Engineering Economics | 2 |  |
| Hum-205 | Principles of Accounting & Costing | 2 |  |
| Hum-207 | Principles of Sociology | 2 | Select One |
| Hum-209 | State & Government  | 2 |

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| **Basic Engineering (Credit requirement 30+15 = 45)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CWRE-101 | Analytical Mechanics | 4 |  |
| CWRE-103 | Surveying | 3 |  |
| CWRE-105 | Engineering Geology and Geomorphology | 3 |  |
| CWRE-201 | Fluid Mechanics | 4 |  |
| CWRE-205 | Computer Programming & Numerical Methods | 3 |  |
| CE-281 | Engineering Materials | 4 |  |
| CE-283 | Mechanics of Solid-I | 3 |  |
| CE-285 | Mechanics of Solid-II | 3 |  |
| EEE-153 | Basic Electrical Engineering | 3 |  |
| CWRE-100 | Engineering Drawing-I | 1.5 |  |
| CWRE-102 | Engineering Drawing-II | 1.5 |  |
| CWRE-104 | Practical Surveying | 1.5 |  |
| EEE-154 | Basic Electrical Engineering Sessional | 1.5 |  |
| CWRE-200 | Details of Construction Sessional | 1.5 |  |
| CWRE-202 | Fluid Mechanics Sessional | 1.5 |  |
| CWRE-204 | Estimating and Cost Analysis | 1.5 |  |
| CWRE-206 | Computer programming Sessional | 1.5 |  |
| CE-282 | Engineering Materials Sessional | 1.5 |  |
| CE-284 | Mechanics of Solid sessional | 1.5 |  |

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| **Structural Engineering (Credit requirement 16+4.5 = 20.5)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CE-381 | Structural Analysis and Design-I | 3 |  |
| CE-383 | Structural Analysis and Design-II | 3 |  |
| CE-481 | Structural Analysis and Design-III | 3 |  |
| CE-385 | Design of Concrete Structures - I | 3 |  |
| CE-387 | Design of Concrete Structures – II | 4 |  |
| CE-382 | Structural Analysis and Design Sessional | 1.5 |  |
| CE-386 | Concrete Structures Design Sessional-I | 1.5 |  |
| CE-482 | Concrete Structures Design Sessional-II | 1.5 |  |

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| **Water Resources Engineering (Credit requirement 25 + 7.5 = 32.5)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CWRE-203 | Hydrology | 3 |  |
| CWRE-301 | Open Channel Hydraulics | 4 |  |
| CWRE-303 | GIS and RS in Water Resources Engineering | 2 |  |
| CWRE-401 | River Engineering and Flood Mitigation | 3 |  |
| CWRE-405 | Ground Water Engineering | 2 |  |
| CWRE-407 | Hydraulic Structures  | 3 |  |
| CWRE-411 | Irrigation and Drainage Engineering | 3 |  |
| CWRE-413 | Coastal Engineering | 3 |  |
| CWRE-421 | Hydraulic Machinery | 2 | Select One |
| CWRE-423 | Port and Harbour Engineering | 2 |
| CWRE-425 | Integrated Water Resource Management (IWRM) | 2 |
| CWRE-427 | Climatology | 2 |
| CWRE-429 | Waterways Engineering | 2 |
| CWRE-302 | Open Channel Hydraulics Sessional | 1.5 |  |
| CWRE-304 | GIS and RS in Water Resources Engineering Sessional | 1.5 |  |
| CWRE-402 | Computer Applications in Water Resources Engineering | 1.5 |  |
| CWRE-408 | Design of Hydraulic Structures | 1.5 |  |
| CWRE-412 | Irrigation and Drainage Engineering Sessional | 1.5 |  |

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| **Environmental Engineering (Credit requirement 6+1.5 =7.5)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CE-353 | Water Supply, Water quality & Treatment and Wastewater Engineering | 3 |  |
| CE-355 | Environmental Pollution and Solid Waste Management | 3 |  |
| CE-354 | Environmental Engineering Sessional | 1.5 |  |

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| **Project/Thesis (Credit requirement 4.5)** |  |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CWRE-400 | Project/Thesis | 4.5 |  |

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| **Geotechnical Engineering (Credit requirement 7+1.5 = 8.5)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CE-335 | Principles of Soil Mechanics | 4 |  |
| CE-337 | Foundation Engineering | 3 |  |
| CE-336 | Geotechnical Engineering Sessional | 1.5 |  |

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| **Transportation Engineering (Credit requirement 4+1.5 = 5.5)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CE-343 | Transportation Engineering | 4 |  |
| CE-344 | Transportation Engineering Sessional | 1.5 |  |

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|  **Professional Practices (Credit requirement 6)** |
| **Course No.** | **Course Title** | **Credit**  | **Remarks**  |
| CWRE-451 | Water Resources Planning and Construction Management  | 3 |  |
| CWRE-453 | Professional Practices and Communication | 3 | Select one |
| CWRE-455 | Socioeconomic Aspects of Development Projects | 3 |
| CWRE-450 | Institutional/Industrial Training | Non Credit | Optional  |

**Schedule of Undergraduate Courses for Different Levels and Terms**

**Level – 1 Term – I**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-101 | Analytical Mechanics | 4 | C |  | Theory = 16 |
| EEE-153 | Basic Electrical Engineering | 3 | C |  |
| Chem-105 | Chemistry | 3 | C |  |
| Math-105 | Differential and Integral Calculus | 3 | C |  |
| Hum-105 | English | 3 | C |  |
| CWRE-100 | Engineering Drawing – I | 1.5 | C |  | Sessional = 4.5 |
| EEE-154 | Electrical Engineering sessional | 1.5 | C |  |
| Chem-106 | Chemistry Sessional | 1.5 | C |  |
|  | **Total = 20.5** |

Note: C = Compulsory O = Optional

**Level – 1 Term – II**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-103 | Surveying | 3 | C |  | Theory = 14 |
| CWRE- 105 | Engineering Geology and Geomorphology | 3 | C |  |
| Phy-105 | Physics | 3 | C |  |
| Math-107 | Matrices and Solid Geometry | 3 | C |  |
| Hum-107 | Engineering Economics | 2 | C |  |
| CWRE-102 | Engineering Drawing – II | 1.5 | C |  | Sessional = 4.5 |
| CWRE-104 | Practical Surveying | 1.5 | C |  |
| Phy-108 | Physics Sessional | 1.5 | C |  |
|  | **Total = 18.5** |

Note: C = Compulsory O = Optional

**Level – 2 Term – I**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-201 | Fluid Mechanics | 4 | C |  | Theory = 16 |
| CE-281 | Engineering Materials | 4 | C |  |
| CE-283 | Mechanics of Solid-I | 3 | C |  |
| Math-205 | Differential Equations | 3 | C |  |
| Hum-205 | Principles of Accounting & Costing | 2 | C |  |
| CE-284 | Mechanics of Solid sessional | 1.5 | C |  | Sessional = 4.5 |
| CWRE-200 | Details of Construction sessional | 1.5 | C |  |
| CE-282 | Engineering Materials sessional | 1.5 | C |  |
|  | **Total = 20.5** |

Note: C = Compulsory O = Optional

**Level – 2 Term – II**

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| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-203 | Hydrology | 3 | C |  | Theory = 14 |
| CWRE-205 | Computer programming &Numerical Methods | 3 | C |  |
| CE-285 | Mechanics of Solids-II | 3 | C |  |
| Math-207 | Vector Calculus, Statistics and Harmonics | 3 | C |  |
| Hum-207 | Principles of Sociology | 2 | O | Select One |
| Hum-209 | State & Government | 2 | O |
| CWRE-202 | Fluid Mechanics sessional | 1.5 | C |  | Sessional = 4.5 |
| CWRE-206 | Computer Programming Sessional | 1.5 | C |  |
| CWRE-204 | Estimating and Cost Analysis  | 1.5 | C |  |
|  | **Total = 18.5** |

Note: C = Compulsory O = Optional

**Level – 3 Term – I**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-301 | Open Channel Hydraulics | 4 | C |  | Theory = 17 |
| CE-335 | Principles of Soil Mechanics | 4 | C |  |
| CE-353 | Water Supply, Water Quality & Treatment and Wastewater Engineering | 3 | C |  |
| CE-381 | Structural Analysis and Design –I | 3 | C |  |
| CE-385 | Design of Concrete Structure-I | 3 | C |  |
| CWRE-302 | Open Channel Hydraulics Sessional | 1.5 | C |  | Sessional = 4.5 |
| CE-336 | Geotechnical Engineering Sessional | 1.5 | C |  |
| CE-382 | Structural Analysis and Design Sessional | 1.5 | C |  |
|  | **Total = 21.5** |

Note: C = Compulsory O = Optional

 **Level – 3 Term – II**

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| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-303 | GIS and RS in Water Resources Engineering  | 2 | C |  | Theory = 15Sessional = 4.5 |
| CE-337 | Foundation Engineering | 3 | C |  |
| CE-355 | Environmental Pollution and Solid waste Management | 3 | C |  |
| CE-383 | Structural Analysis and Design –II | 3 | C |  |
| CE-387 | Design of Concrete Structure-II | 4 | C |  |
| CWRE-304 | GIS and RS in Water ResourcesEngineering Sessional | 1.5 | C |  |
| CE-354 | Environmental Engineering Sessional | 1.5 | C |  |
| CE-386 | Concrete Structure & Design Sessional-I | 1.5 | C |  |
|  | **Total = 19.5** |

Note: C = Compulsory O = Optional

**Level – 4 Term – I**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-401 | River Engineering andFlood Mitigation  | 3 | C |  | Theory = 16 |
| CWRE-451 | Water Resources Planning andConstruction Management | 3 | C |  |
| CWRE-453 | Professional Practicesand Communication | 3 | O | Select one |
| CWRE-455 | Socioeconomic Aspects of Development Projects | 3 | O |
| CE-449 | Transportation Engineering | 4 | C |  |
| CE-481 | Structural Analysis and Design –III | 3 | C |  |
| CWRE-402 | Computer Applications inWater Resources Engineering | 1.5 | C |  | Sessional = 4.5 |
| CE-442 | Transportation Engineering Sessional | 1.5 | C |  |
| CE-482 | Concrete Structure and Design Sessional-II | 1.5 | C |  |
| CWRE-450 | Institutional/industrial Training | Non Credit  | O |  |  |
| CWRE-400 | **Project/Thesis** |  **1.5** |
| **Total=22.0** |

Note: C = Compulsory O = Optional

**Level – 4 Term – II**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Cr. Hr.** | **Type** | **Remarks** | **Total Credits** |
| CWRE-405 | Ground Water Engineering | 2 | C |  | Theory = 13 |
| CWRE-407 | Hydraulic Structures | 3 | C |  |
| CWRE-411 | Irrigation and Drainage Engineering | 3 | C |  |
| CWRE-413 | Coastal Engineering | 3 | C |  |
| CWRE-421 | Hydraulic Machinery | 2 | O | Select one |
| CWRE-423 | Port and Harbor Engineering | 2 | O |
| CWRE-425 | Integrated Water Resource Management (IWRM) | 2 | O |
| CWRE-427 | Climatology | 2 | O |
| CWRE-429 | Waterways Engineering | 2 | O |
| CWRE-408 | Design of Hydraulic Structure sessional | 1.5 | C |  | Sessional = 3.0 |
| CWRE-412 | Irrigation and Drainage Engineering Sessional | 1.5 | C |  |
| CWRE-400 | **Project/Thesis** |  3.0 |
| **Total= 19.0** |

Note: C = Compulsory O = Optional