**MS in Civil Engineering, Program/Course Outcomes Matrix**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **How many program outcomes does the course contribute?**  **(Count)** | **How much does the course contribute towards program outcomes (by weight)?** |
| Advanced mathematical applications in civil engineering | Unique, novel, and sustainable civil engineering system and process design | Possess professional and academic ethical principles | Be able to design and carry out experiments, analyze and interpret data | Define engineering problems, idenify solution procedures, and carry out their solution | Evaluate social, environmental, and economic impacts of engineering decisions |
| **Program Mandatory Courses** | | | | | | | | | |
| MATH 503 | Uncertainty and Decision Making | 2 |  |  |  |  |  | 1 | 2 |
| CE 571 | Sustainable Construction |  | 2 | 1 | 1 |  | 2 | 4 | 6 |
| CE 590 | Graduation Project (For non-thesis track students) |  |  | 1 | 2 |  |  | 2 | 3 |
| CE 591 | Pre-thesis Seminar (For thesis track students) |  |  | 1 |  |  |  | 1 | 1 |
| CE 592 | Master’s Thesis I (For thesis track students) |  |  | 1 | 2 |  |  | 2 | 3 |
| CE 593 | Master’s Thesis II (For thesis track students) |  |  | 1 | 2 |  |  | 2 | 3 |
| CE 594 | Research Methods and Academic Publication Ethics |  |  | 2 |  |  |  | 1 | 2 |
| **Program Elective Courses** | | | | | | | | | |
| CE 511 | Reinforced Concrete Structures |  |  |  |  | 1 |  | 1 | 1 |
| CE 514 | Introduction to Earthquake Resistant Design | 1 |  |  |  | 1 |  | 2 | 2 |
| CE 536 | Integrated Coastal Zone Management |  | 1 |  |  | 1 | 1 | 3 | 3 |
| CE 537 | Sustainable Sediment Management in Water Resources Engineering |  | 1 |  |  | 1 | 1 | 3 | 3 |
| CE 538 | Sediment Transport |  |  |  | 1 | 1 |  | 2 | 2 |
| CE 539 | Coastal Hydraulics |  |  |  | 1 | 1 |  | 2 | 2 |
| CE 542 | Geotechnical Engineering Applications Benefitting Society |  | 1 |  |  | 1 | 1 | 3 | 3 |
| CE 545 | Soil Improvement and Sustainability: Conventional and Innovative Applications |  | 1 |  |  | 1 | 1 | 3 | 3 |
| CE 552 | Practical Aspects of Construction Management |  |  |  |  | 1 |  | 1 | 1 |
| CE 553 | International Civil Engineering Contracts |  |  |  |  | 1 |  | 1 | 1 |
| CE 554 | Contractual Aspects of Construction Works |  |  |  |  | 1 |  | 1 | 1 |
| CE 555 | Construction Site Management |  |  |  |  | 1 |  | 1 | 1 |
| CE 556 | Construction Process and Document Manage |  |  |  |  | 1 |  | 1 | 1 |
| CE 557 | Contract and Claim Management |  |  |  |  | 1 |  | 1 | 1 |
| CE 558 | International Arbitration |  |  |  |  | 1 |  | 1 | 1 |
| CE 573 | Renewable Energy Projects |  | 1 |  |  | 1 | 1 | 3 | 3 |
| CE 574 | Design for Environment |  | 2 |  | 1 | 1 | 2 | 4 | 6 |
| CE 581 | Structural Dynamics | 1 |  |  | 1 | 1 |  | 3 | 3 |
| CE 582 | Earthquake Engineering | 1 |  |  | 1 | 1 |  | 3 | 3 |
| CE 583 | Engineering Seismology | 1 |  |  | 1 | 1 |  | 3 | 3 |
| CE 595 | Special Topics in Civil Engineering |  |  |  |  | 2 |  | 1 | 2 |
|  | | | | | | | |
| **Number of Courses that Contribute to Program Outcome** | | 5 | 7 | 6 | 10 | 21 | 7 |
| **Weight of Program Outcome Towards Curriculum** | | 6 | 9 | 7 | 13 | 22 | 9 |