

Civil Engineering

FRACTAL CURRICULUM (REDUCED)

2017 and latter Batches

Semester I

| ID | Course | Credit | Segment |
|--------|-------------------------------------|--------------|---------|
| ID1035 | Independent Project | 1 | 16 |
| MA1110 | Calculus-I | 1 | 12 |
| MA1220 | Calculus-II | 2 | 36 |
| ID1303 | Introduction to Programming | 2 | 36 |
| CY1017 | Environmental Chemistry-I | 1 | 12 |
| ID1130 | Engineering Statics | 2 | 13 |
| ID1100 | Fluid Mechanics-I | 2 | 46 |
| ID1054 | Digital Fabrication | 2 | 16 |
| ID1041 | Engineering Drawing (3 hours Class) | 2 | 16 |
| ID1171 | Fabrication Lab-I | 2 | 16 |
| | | 17 cr | |

Semester II

| | | | |
|--------|---|---------------|----|
| MA1130 | Vector Calculus | 1 | 12 |
| MA1140 | Linear Algebra | 1 | 34 |
| MA1150 | Differential Equations | 1 | 56 |
| ID1160 | Solid Mechanics-I | 2 | 13 |
| CY1020 | Dynamics of Chemical Systems-I | 1 | 12 |
| ME1030 | Dynamics | 2 | 46 |
| ID1140 | Thermodynamics-I | 1 | 12 |
| ID1150 | Thermodynamics-II | 2 | 36 |
| CE2020 | Construction Materials | 1.5 | 46 |
| CE3512 | Introduction to Environmental Engineering | 1 | 12 |
| LAXXXX | Liberal and Creative Arts Electives | 2 | |
| ID1370 | Digital Signal Processing | 1 | 12 |
| | | 16.5cr | |

Semester III

| | | | |
|--------|-----------------------------|-------------|----|
| MA2110 | Introduction to Probability | 1 | 12 |
| EP1017 | Classical Physics | 1 | 34 |
| EP1031 | Physics Lab | 2 | 16 |
| ID2020 | Solid Mechanics-II | 2 | 46 |
| ID1310 | Electric Circuits | 1 | 12 |
| CE2021 | Construction Materials Lab | 2 | 16 |
| CE2030 | Concrete Technology | 1.5 | 13 |
| MA2120 | Transforms Techniques | 1 | 34 |
| CY1031 | Chemistry lab | 2 | 16 |
| ID1110 | Fluid Mechanics-II | 1.5 | 13 |
| CE2031 | Fluid Mechanics Lab | 1 | 13 |
| | | 16cr | |

Semester IV

| | | | |
|--------|--------------------------------------|-------------|----|
| MA2130 | Complex Variables | 1 | 12 |
| MA2140 | Statistics | 1 | 34 |
| BO1010 | Introduction to Life Sciences | 1 | 34 |
| CE2101 | Structural Mechanics Lab | 2 | 46 |
| LAXXXX | Liberal and Creative Arts Electives | 2 | |
| CE2100 | Introduction to Structural Analysis | 1.5 | 13 |
| CE2110 | Analysis of Indeterminate Structures | 1.5 | 46 |
| CE3300 | Geotechnical Engineering-I | 1.5 | 13 |
| CE3310 | Geotechnical Engineering-II | 1.5 | 46 |
| CE3301 | Geotechnical Engineering Lab | 2 | 16 |
| | | 15cr | |

Semester V

| | | | |
|-----------------------------|--|---------------------|----|
| CE3312 | Introduction to Foundation Engineering | 1 | 12 |
| CE3322 | Design of Foundations | 2 | 36 |
| CE3102 | Introduction to Reinforced Concrete | 1.5 | 13 |
| CE3122 | Reinforced Concrete Design | 1.5 | 46 |
| CE3500 | Introduction to Hydraulic Engineering | 1.5 | 13 |
| CE2500 | Engineering Hydrology | 2 | 14 |
| CE3501 | Hydraulic Engineering Lab | 1 | 56 |
| BM1030 | Bioengineering | 1 | 56 |
| CE3820 | Highway Design and Materials | 2 | 14 |
| CE3830 | Railway and Airport Engineering | 1 | 56 |
| CE3590 | Environmental Systems Engineering | 2 | 36 |
| XXXXXX/CE3025 ^{\$} | <i>Core Electives / Department Core Elective (Project)</i> | 0-3 | |
| | | 16.5-19.5 cr | |

Semester VI

| | | | |
|-----------------------------|--|-----------------|----|
| CE3510 | Open Channel Hydraulics | 1.5 | 13 |
| CE3010 | Fundamentals of GIS and Remote Sensing | 2 | 14 |
| CE3011 | GIS Lab | 1 | 34 |
| CE3821 | Highway Materials Lab | 1 | 56 |
| CE3142 | Introduction to Structural Steel Design | 1.5 | 13 |
| CE3132 | Design of Steel Structures | 1.5 | 46 |
| LAXXXX | Liberal/Creative Arts | 2 | |
| CE3840 | Traffic Engineering and Planning | 2 | 14 |
| CE3841 | Traffic Engineering Lab | 1.5 | 46 |
| CE3530 | Air Pollution | 2 | 14 |
| XXXXXX/CE3035 ^{\$} | <i>Core Electives / Department Core Elective (Project)</i> | 0-3 | |
| | | 16-19 cr | |

Semester VII

| | | | |
|----------------------------------|--|-----------------|----|
| <i>XXXXXX/CE4025[§]</i> | <i>Core Electives / Department Core Elective (Project)</i> | 3-6 | |
| CE4500 | Water Resources Engineering | 2 | 16 |
| CE4900 | Construction Management | 2 | 16 |
| CE3020 | Surveying | 2 | |
| LAXXXX | Liberal/Creative Arts | 2 | |
| CE3511 | Environmental Engineering lab | 2 | 36 |
| CE3522 | Water and Wastewater Engineering | 2 | 14 |
| | | 15-18 cr | |

Semester VIII

| | | | |
|----------------------------------|--|-----------------|----|
| <i>XXXXXX/CE4045[§]</i> | <i>Core Electives / Department Core Elective (Project)</i> | 3-6 | |
| ID4006 | Ethics and Values | 1 | 56 |
| XXXXXX | Free Electives | 6 | |
| LAXXXX | Liberal/Creative Arts | 2 | |
| | | 12-15 cr | |

Total Credits: 127

[§]Guidelines for taking Core Electives/Projects

- a) Total credits for Core Electives/Projects should be minimum 9 credits
- b) Core electives can be 1, 2, or 3 credit courses
- c) If a project is to be taken, it should be of 3 credits.
- d) If one is fulfilling total of nine credits by taking Project of three credits and Core electives of six credits, three credits of core electives are to be taken from Basket 1 and remaining credits of core electives are to be taken from Basket 2.
- e) If one is fulfilling total of nine credits by taking only Core electives, at least six credits of Core electives are to be taken from Basket 1.

Basket 1 (Departmental Electives): New - revised 2020

| Course Code | Course Name | Credits | Prerequisite | Odd/even semester |
|-------------|--|---------|----------------------------|-------------------|
| CE 6500 | Engineering Hydrology and Hydrologic Systems | 3 | CE3400 | Odd |
| CE 6520 | Irrigation Water Management | 3 | -- | Odd |
| CE 6510 | Open-Channel Hydraulics and Sediment Transport | 3 | CE2400 CE2410 | Even |
| CE6530 | Groundwater Modelling | 3 | CE2400 CE2410 MA1150 | Even |
| CE6540 | Contaminant hydrology and remediation | 3 | -- | Odd |
| CE5220 | Solid waste management | 3 | NIL | Even |
| CE6510 | Advanced water and wastewater engineering | 3 | -- | |
| CE 5110 | Physico-chemical Processes | 3 | -- | Odd |
| CE5130 | Environmental Impact Assessment | 2 | NIL | Odd |
| CE 5210 | Bio-chemical Processes | 3 | CE 5110 | Even |
| CE5230 | Industrial and Hazardous Waste Management | 2 | -- | Even |
| CE5120 | Air pollution control | 3 | -- | Odd |
| CE6300 | Advanced foundation engineering | 3 | CE2300 CE2301 CE3312 | Even |
| CE6310 | Advanced soil mechanics | 3 | CE2300 CE2301 CE3312 | Odd |
| CE6340 | Ground modification techniques | 3 | CE2300 CE2301 CE3312 | Even |
| CE6330 | Soil dynamics | 3 | CE2300 CE2301 CE3312 | Odd |
| CE6352 | Design of earth structures | 3 | CE2300 CE2301 CE3312 | Even |

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|---------|---|---------|--|--------------|
| CE6130 | Finite element analysis | 3 | CE2100 MA1140 CE6110 | Even |
| CE6222 | Prestressed concrete | 3 | CE3102 CE4102 | Even |
| CE6120 | Applied elasticity and Plasticity | 3 | CE2100 CE2110 MA1150 MA1140 | Odd |
| CE4102 | Advanced reinforced concrete design | 2 | CE3102 | Odd |
| CE6140 | Structural dynamics | 3 | CE2100 MA2120 MA1150 MA1140 CE6110 | Even |
| CE6110 | Advanced structural mechanics | 3 | CE2110 CE2100 MA1150 MA1140 | Odd |
| CE6232 | Advanced steel design | 3 | CE3142 | Even |
| CE6150 | Stability of Structures | 3 | CE6110 | When offered |
| CE 6200 | Condition Assessment and Rehabilitation of Structures | 3 | CE3142 CE3102 | When Offered |
| CE6011 | Computer methods in civil engineering | 2 (1-6) | -- | |
| CE4330 | Geology I | 1 (1-2) | -- | |
| CE5390 | Geothermics | 2 | -- | |

Basket 2 (Institute-wide Courses): New - revised 2020

| Course Code | Course Name | Credits |
|-------------|--|---------|
| CE6540 | Contaminant hydrology and remediation | 3 |
| CE6580 | Solid and hazardous waste management | 3 |
| CE6510 | Advanced water and wastewater engineering | 3 |
| CE6520 | Air pollution control | 3 |
| CE6300 | Advanced foundation engineering | 3 |
| CE6310 | Advanced soil mechanics | 3 |
| CE6340 | Ground Modification Techniques | 3 |
| CE6330 | Soil dynamics | 3 |
| CE6352 | Design of earth structures | 3 |
| CE6130 | Finite element analysis | 3 |
| CE6222 | Prestressed concrete | 3 |
| CE6120 | Applied elasticity and Plasticity | 3 |
| CE4102 | Advanced Reinforced Concrete Design | 2 |
| CE6140 | Structural dynamics | 3 |
| CE6110 | Advanced structural mechanics | 3 |
| CE6232 | Advanced steel design | 3 |
| CE6150 | Stability of Structures | 3 |
| CE 6200 | Condition Assessment and Rehabilitation of Structures | 3 |
| CE6500 | Engineering hydrology and hydrologic systems | 3 |
| CE6610 | Remote sensing and GIS applications to civil engineering | 3 |
| CE6530 | Ground water modeling | 3 |
| CE6011 | Computer methods in civil engineering | 2 |
| CE4330 | Geology I | 1 |
| CE5390 | Geothermics | 2 |
| ME2090 | Kinematics of mechanisms | 2 (1-3) |
| ME2100 | Dynamics of mechanisms | 2 (4-6) |

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|--------|--|-----------|
| ME3150 | Applied elasticity | 2 (1-4) |
| ME3413 | Machine drawing and solid modeling | 2 (1-6) |
| ME2070 | Introduction to mathematical modeling | 1.5 (1-3) |
| ME5010 | Mathematical methods for engineers | 3 |
| ME5110 | Advanced mechanics of solids | 3 |
| ME5120 | Dynamics and vibration | 3 |
| ME5700 | Analysis and design of composite structures | 3 |
| ME5610 | Fracture mechanics | 3 |
| ME5630 | Nonlinear oscillation | 3 |
| ME5690 | Advanced FEM | 3 |
| ME5260 | Continuum mechanics | 3 |
| ME5320 | Advanced heat transfer | 3 |
| ME5330 | Computational fluid dynamics | 3 |
| CH5050 | Computational methods for engineers | 3 |
| MS5100 | Composite materials | 3 |
| MS5140 | Introduction to computational methods in materials science | 3 |