



Universidad Politécnica de Puerto Rico  
 Graduate School  
 Master Program in Civil Engineering



| M.S.C.E.*<br>(Thesis Option)        | M.E.C.E.*<br>(Design Project Option) |
|-------------------------------------|--------------------------------------|
| Required Courses: 6 credit-hours    | Required courses: 3 credit-hours     |
| Major Area: 18 credit-hours         | Major Area: 24 credit-hours          |
| Out-of-Major Area**: 6 credit-hours | Out-of-Major Area**: 6 credit-hours  |
| Thesis: 6 credit-hours              | Design Project: 3 credit-hours       |
| Total: 36 credit-hours              | Total: 36 credit-hours               |

## Structural Engineering

### MSCE Required Courses

CE 6370 – Finite Element Methods in Engineering  
 GMP 6510 – Research Methodology

### MECE Required Courses

CE 6370 – Finite Element Methods in Engineering

### Major Area Courses

CE 5108 – Prestressed Concrete Structures Design  
 CE 5116 – Design of Wood Structures  
 CE 6300 – Structural Engineering Laboratory  
 CE 6305 – Simulation Engineering Laboratory  
 CE 6315 – Analysis of Plates and Shells  
 CE 6320 – Advanced Strength of Materials  
 CE 6323 – Design of Composite Materials  
 CE 6325 – Principles of Structural Stability  
 CE 6330 – Advanced Topics in Structural Engineering  
 CE 6335 – Advanced Foundations  
 CE 6340 – Advanced Bridge Design  
 CE 6345 – Design of Reinforced Masonry Structures

CE 6350 – Dynamics of Structures  
 CE 6355 – Advanced Earthquake Engineering  
 CE 6357 – Wind Engineering  
 CE 6360 – Bridge Inspection, Rehabilitation, Repair, and Management  
 CE 6375 – Advanced Finite Element Methods in Engineering  
 CE 6378 – Advanced Reinforced Concrete Design  
 CE 6380 – Nonlinear Behavior of Concrete Structures  
 CE 6385 – Advanced Steel Design  
 CE 6390 – Lateral Load Distribution in Multistory Buildings  
 CE 6395 – Nonlinear Analysis of Soil-Structure Interaction

### Out-of-Major Area Courses

The student may select 6 credits (Thesis or Project options) as Out-of-Major Area elective from any other GMP, CE graduate or advanced undergraduate courses.

#### Thesis

CE 6901  
 CE 6902

#### Design Project

CE 6905  
 CE 6906

\*Note: A maximum of 6 credit-hours in advanced undergraduate courses (Level 5000) can be taken.  
 \*\* Students are allowed to replace Out-of-Major courses with Major Area courses.

Contact Information:  
 Graduate School  
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## Geotechnical Engineering

### MSCE Required Courses

CE 6370 – Finite Element Methods in Engineering  
 GMP 6510 – Research Methodology

### MECE Required Courses

CE 6370 – Finite Element Methods in Engineering

### Major Area Courses

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>CE 5208 – Soil Improvement</li> <li>CE 5220 – Pavement Design</li> <li>CE 6100 – Soil Shear Strength</li> <li>CE 6105 – Advanced Geotechnical Engineering Applications</li> <li>CE 6110 – Earth Retaining Structures</li> <li>CE 6114 – Shallow Foundations</li> <li>CE 6116 – Consolidation Theory and Applications</li> <li>CE 6120 – Deep Foundations</li> <li>CE 6125 – Soil Dynamics</li> </ul> | <ul style="list-style-type: none"> <li>CE 6130 – Geotechnical Earthquake Engineering</li> <li>CE 6140 – Slope Stability</li> <li>CE 6150 – Seepage &amp; Drainage</li> <li>CE 6230 – Groundwater Hydrology</li> <li>CE 6270 – Sedimentation Engineering</li> <li>CE 6335 – Advanced Foundations</li> <li>CE 6395 – Nonlinear Analysis of Soil-Structure Interaction</li> <li>CE 6430 – Remediation in Contaminated Subsurface Environments</li> </ul> |
|---|---|

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#### Thesis

CE 6901  
 CE 6902

#### Design Project

CE 6905  
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### Water Resources and Water Treatment

#### MSCE Required Courses

CE 6210 – Probability and Statistics in Water Resources  
 GMP 6510 – Research Methodology

#### MECE Required Courses

CE 6210 – Probability and Statistics in Water Resources

#### Major Area Courses

CEE 5020 – Environmental Laws and Regulations  
 CEE 5030 – Advanced Hydraulics  
 ENVE 5620 – Environmental Audits  
 ENVE 5670 – Environmental Remediation  
 CE 6220 – Meteorology  
 CE 6230 – Groundwater Hydrology  
 CE 6240 – Urban Drainage  
 CE 6250 – Advanced Hydrologic and Hydraulic Models  
 CE 6260 – Analysis and Restoration of Fluvial Systems

CE 6270 – Sedimentation Engineering  
 CE 6280 – Reservoir Analysis and Design  
 CE 6410 – Water and Wastewater Treatment Applications  
 CE 6420 – Fate and Transport of Contaminants in Soils  
 CE 6430 – Remediation in Contaminated Subsurface Environments  
 CE 6440 – Physical and Chemical Treatment Processes of Water and Wastewater  
 CE 6450 – Biological Wastewater Treatment Processes  
 CE 6460 – Water Quality Control and Management

#### Out-of-Major Area Courses

The student may select 6 credits (Thesis or Project options) as Out-of-Major Area elective from any other course labeled as CE 6xxx, GMP 6xxx, MEM 69xx or EPM 6xxx and CE advanced undergraduate courses.

#### Thesis

CE 6901  
 CE 6902

#### Design Project

CE 6905  
 CE 6906

\*Note: A maximum of 6 credit-hours in advanced undergraduate courses (Level 5000) can be taken.  
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## Construction Engineering

### MSCE Required Courses

CE 6532 – Construction Cost Control  
 GMP 6510 – Research Methodology

### MECE Required Courses

CE 6532 – Construction Cost Control

### Major Area Courses

CE 5510 – Planning Scheduling and Cost Estimates  
 CE 5522 – Construction Documents for Civil Engineering  
 CE 6512 – Value Engineering  
 CE 6520 – Construction Contracting and Procurement  
 CE 6530 – Schedule Impact Analysis  
 CE 6540 – Construction Equipment Administration

CE 6542 – Construction Material Management  
 CE 6544 – Hazardous Material Management  
 CE 6550 – Construction Inspections  
 CE 6560 – Construction Safety and Regulations  
 CE 6570 – Modern Construction Materials  
 CE 6580 – Temporary Structures in Construction  
 CE 6585 – Site Planning and Design

### Out-of-Major Area Courses

The student may select 6 credits (Thesis or Project options) as Out-of-Major Area elective from any other course labeled as CE 6xxx, GMP 6xxx, MGM 5xxx, MEM, or EPM and CE advanced undergraduate courses.

### Thesis

CE 6901  
 CE 6902

### Design Project

CE 6905  
 CE 6906

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