# Major in Civil Engineering, Soil and Water Resource Engineering Concentration

## Requirements

**Effective Fall 2015**

View Major Completion Map (http://wsnet.colostate.edu/CWIS608/Home/MajorCompletionMap)

### Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>AUCC</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE 102</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CIVE 103</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CO 150</td>
<td>1A</td>
<td>3</td>
</tr>
<tr>
<td>MATH 160</td>
<td>1B</td>
<td>4</td>
</tr>
<tr>
<td>MATH 161</td>
<td>1B</td>
<td>4</td>
</tr>
<tr>
<td>PH 141</td>
<td>3A</td>
<td>5</td>
</tr>
<tr>
<td>PH 142</td>
<td>3A</td>
<td>5</td>
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</tbody>
</table>

Science Technical Elective select one of the following groups:

**Group A**

- BZ 110 Principles of Animal Biology (GT-SC2) 3A
- BZ 111 Animal Biology Laboratory (GT-SC1) 3A

**Group B**

- BZ 120 Principles of Plant Biology (GT-SC2) 3A

**Group C**

- GEOL 120 Exploring Earth: Physical Geology (GT-SC2) 3A
- GEOL 121 Introductory Geology Laboratory (GT-SC1) 3A

**Group D**

- GEOL 121 Introductory Geology Laboratory (GT-SC1) 3A
- GEOL 122 The Blue Planet: Geology of Our Environment (GT-SC2) 3A

**Group E**

- GEOL 121 Introductory Geology Laboratory (GT-SC1) 3A
- GEOL 124 Geology of Natural Resources (GT-SC2) 3A

**Group F**

- GEOL 150 Physical Geology for Scientists and Engineers

### Sophomore

<table>
<thead>
<tr>
<th>Course</th>
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<td>CHEM 111</td>
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<tr>
<td>CHEM 112</td>
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<tr>
<td>CIVE 202</td>
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<tr>
<td>CIVE 203</td>
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<tr>
<td>CIVE 260</td>
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</tr>
<tr>
<td>CIVE 261</td>
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<td>CIVE 360</td>
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<td>MATH 261</td>
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<tr>
<td>MECH 237</td>
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<tr>
<td>SOCR 240</td>
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<td>4</td>
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<tr>
<td>Arts and Humanities</td>
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### Junior

<table>
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<tr>
<td>CHEM 113</td>
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<tr>
<td>CIVE 300</td>
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<tr>
<td>CIVE 301</td>
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<td>3</td>
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<tr>
<td>CIVE 302</td>
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<td>3</td>
</tr>
<tr>
<td>CIVE 322</td>
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<td>3</td>
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<tr>
<td>CIVE 330</td>
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<td>3</td>
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<td>CIVE 367</td>
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<tr>
<td>MATH 340</td>
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<td>4</td>
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<tr>
<td>Engineering Technical Elective (see list below)</td>
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<td></td>
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<tr>
<td>Advanced Writing</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>3B</td>
<td>3</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>3E</td>
<td>3</td>
</tr>
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</table>

### Senior

Select one from the following:

- AREC 342 Water Law, Policy, and Institutions 3
- WR 416 Land Use Hydrology 3
- CIVE 401 Hydraulic Engineering 3
- CIVE 402 Senior Design Principles 4A,4B 3
- CIVE 403 Senior Project Design 4C 3
- CIVE 425 Soil and Water Engineering 3
- CIVE 440 Nonpoint Source Pollution 3
- Historical Perspectives 3D 3

**Total Credits**

- Freshman: 31
- Sophomore: 34
- Junior: 35
- Senior: 3

**Additional Requirements for Graduation**

- Freshman: 0
- Sophomore: 1
- Junior: 0
- Senior: 1
**Major in Civil Engineering, Soil and Water Resource Engineering Concentration**

**Freshman**

<table>
<thead>
<tr>
<th>AUCC</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social and Behavioral Sciences</td>
<td>3C</td>
</tr>
<tr>
<td>Science/Additional Technical Elective Selection</td>
<td>2</td>
</tr>
<tr>
<td>Additional Requirements for Graduation</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

**Program Total Credits:** 130

**ENGINEERING TECHNICAL ELECTIVES**

Select one course from this list, and a second course either from the Engineering Technical Elective list or from the list of Additional Technical Electives below:

- CBE 540/ CIVE 540: Advanced Biological Wastewater Processing
- CIVE 305: Intermediate AutoCAD
- CIVE 355: Introduction to Geotechnical Engineering
- CIVE 413: Environmental River Mechanics
- CIVE 423: Groundwater Engineering
- CIVE 424/ GEOL 424: Modern Gas and Oil
- GEOL 424: Pipeline Engineering and Hydraulics
- CIVE 438: Environmental Engineering Concepts
- CIVE 502: Fluid Mechanics
- CIVE 504: Wind Engineering
- CIVE 510: Applied Hydraulic System Design
- CIVE 512: Irrigation Systems Design
- CIVE 514: Hydraulic Structures/Systems
- CIVE 516: Water Control and Measurement
- CIVE 519: Irrigation Water Management
- CIVE 520: Physical Hydrology
- CIVE 521: Hydrometry
- CIVE 522: Engineering Hydrology
- CIVE 524/WR 524: Modeling Watershed Hydrology
- CIVE 525: Water Engineering: International Development
- CIVE 531: Groundwater Hydrology
- CIVE 532: Wells and Pumps
- CIVE 534: Applied and Environmental Molecular Biology
- CIVE 538: Aqueous Chemistry
- CIVE 539: Water and Wastewater Analysis
- CIVE 540: Advanced Biological Wastewater Processing
- CIVE 541: Environmental Unit Operations-Treatment-Design
- CIVE 544: Water Resources Planning and Management
- CIVE 546: Water Resource Systems Analysis
- CIVE 547/ STAT 547: Statistics for Environmental Monitoring
- CIVE 549: Drainage and Wetland Engineering
- CIVE 550: Foundation Engineering
- CIVE 558: Containment Systems for Waste Disposal
- CIVE 571: Pipeline Engineering and Hydraulics
- CIVE 573: Urban Stormwater Management
- CIVE 574: Civil Engineering Project Management
- CIVE 576: Engineering Applications of GIS and GPS
- CIVE 577: GIS in Civil and Environmental Engineering
- CIVE 578: Infrastructure and Utility Management
- ENGR 550/ MATH 550: Numerical Methods in Science and Engineering

**ADDITIONAL TECHNICAL ELECTIVES**

Select a minimum of 3 credits from the following, or select a second course from the Engineering Technical Elective List:

- AREC 340/ ECON 340: Introduction: Economics of Natural Resources
- ATS 350: Introduction to Weather and Climate
- ATS 351: Introduction to Weather and Climate Laboratory
- GR 323/NR 323: Remote Sensing and Image Interpretation
- NR 322: Introduction to Geographic Information Systems
- RS 300: Rangeland Conservation and Stewardship
- SOC 461: Water, Society, and Environment
- SOCR 377: Geographic Information Systems in Agriculture
- SOCR 421: Crop and Soil Management Systems II
- SOCR 470: Soil Physics
- SOCR 471: Soil Physics Laboratory
- WR 417: Watershed Measurements

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1 Students are required to participate in the Professional Learning Institute (PLI) program as a requirement for graduation. The program consists of eleven PLI workshops distributed by focus areas as follows: Global and Cultural Diversity (2 workshops), Innovation (2 workshops), Leadership (2 workshops), Civic and Public Engagement (2 workshops), and Ethics (3 workshops). Each workshop is between 1-2 hours long and no outside preparation is required to attend any of the workshops. Attendance at the required workshops may be spread over the student's four-year program.

2 Select from department list of technical elective courses. At least 6 credits must be in engineering. At least 4 credits must be from the list of additional science technical electives.

3 Only one of NR 322 or SOCR 377 will be accepted as credit to fulfill the Technical Elective requirement.