CIVIL ENGINEERING DEGREE REQUIREMENTS 2015-2016

*** LOWER DIVISION ***

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Qtr(s) Offered</th>
<th>Prerequisites &amp; Enrollment Restrictions</th>
<th>Notes and web links to resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 21A*</td>
<td>Calculus (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>2 yrs high school algebra, trig, geometry &amp; placement by exam</td>
<td></td>
</tr>
<tr>
<td>MAT 21B</td>
<td>Calculus (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>MAT 21A</td>
<td></td>
</tr>
<tr>
<td>MAT 21C*</td>
<td>Calculus (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>MAT 21B</td>
<td><a href="https://www.math.ucdavis.edu/resources/learning/">https://www.math.ucdavis.edu/resources/learning/</a></td>
</tr>
<tr>
<td>MAT 22A*</td>
<td>Linear Algebra</td>
<td>3</td>
<td>F   W  S</td>
<td>9 units of college math, Matlab (or MAT 22AAL concurrently)</td>
<td></td>
</tr>
<tr>
<td>MAT 22B*</td>
<td>Differential Equations</td>
<td>3</td>
<td>F   W  S</td>
<td>MAT 21C, 22A</td>
<td></td>
</tr>
<tr>
<td>PHY 9A*</td>
<td>Classical Physics (L/D)</td>
<td>5</td>
<td>F   S</td>
<td>MAT 21B</td>
<td></td>
</tr>
<tr>
<td>PHY 9C</td>
<td>Classical Physics (L/D)</td>
<td>5</td>
<td>F   W</td>
<td>PHY 9B, MAT 21D; MAT 22A (MBTC)</td>
<td></td>
</tr>
<tr>
<td>CHE 2A*</td>
<td>General Chemistry (L/D)</td>
<td>5</td>
<td>F   W</td>
<td>Placement by exam</td>
<td></td>
</tr>
<tr>
<td>ENG 35*</td>
<td>Statics (d)</td>
<td>4</td>
<td>F   W</td>
<td>MAT 21D (MBTC), PHY 9A with C- or better; Pass 1 Engineering only</td>
<td></td>
</tr>
<tr>
<td>ENG 45 or 45Y</td>
<td>Properties of Materials (L)</td>
<td>4</td>
<td>F   W</td>
<td>MAT 21C, CHE 2A, PHY 9A all with C- or better; Pass 1 Engineering only</td>
<td></td>
</tr>
<tr>
<td>ECI 3</td>
<td>Intro to Civil &amp; Environ Eng Sys (L)</td>
<td>4</td>
<td>F</td>
<td>MAT 21A (MBTC) [Fresh/ Soph course - or replace with 4 units of ECI Elective]</td>
<td></td>
</tr>
<tr>
<td>ECI 16</td>
<td>Spatial Data Analysis (L)</td>
<td>2</td>
<td>S</td>
<td>Restricted to Civil and Bio Sys Eng majors</td>
<td></td>
</tr>
</tbody>
</table>

**PHYSICAL and BIOLOGICAL SCIENCES requirement:** select ONE of the following four courses (4 units required)

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>PHY 9D</td>
<td>Modern Physics (d)</td>
<td>4</td>
<td>F   S</td>
<td>PHY 9C, MAT 22A; MAT 22B recom (MBTC)</td>
<td></td>
</tr>
<tr>
<td>CHE 2C</td>
<td>General Chemistry (L/D)</td>
<td>5</td>
<td>F   S</td>
<td>CHE 2B</td>
<td></td>
</tr>
<tr>
<td>BIS 2A</td>
<td>Intro to Biology (d)</td>
<td>5</td>
<td>F   W</td>
<td>MAT 21A (MBTC); prior programming experience recomm/expected</td>
<td></td>
</tr>
<tr>
<td>GEL 50-50L</td>
<td>Physical Geology &amp; Lab</td>
<td>3/2</td>
<td>F   W</td>
<td>High school phys &amp; chem - reduced unit credit if GEL 1 completed -</td>
<td></td>
</tr>
</tbody>
</table>

**PROGRAMMING requirement:** select ONE of the following three courses (4 units required)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Qtr(s) Offered</th>
<th>Prerequisites &amp; Enrollment Restrictions</th>
<th>Notes and web links to resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECI 19</td>
<td>C Programming for Engineers (L)</td>
<td>4</td>
<td>not offered 15-16</td>
<td>MAT 21A (MBTC)</td>
<td></td>
</tr>
<tr>
<td>ENG 6</td>
<td>Engineering Problem Solving (Matlab) (D)</td>
<td>4</td>
<td>F   W  S</td>
<td>MAT (16A or) 21A with C- or better; MAT 21B (MBTC)</td>
<td></td>
</tr>
<tr>
<td>ECS 30</td>
<td>Programming &amp; Prob Solving (C) (D)</td>
<td>4</td>
<td>F   W  S</td>
<td>MAT 21A (MBTC); prior programming experience recomm/expected</td>
<td></td>
</tr>
</tbody>
</table>

**COMMUNICATION requirement:** select ONE of the following two courses (4 units required)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<th>Prerequisites &amp; Enrollment Restrictions</th>
<th>Notes and web links to resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMN 1</td>
<td>Intro to Public Speaking (D)</td>
<td>4</td>
<td>F   W  S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMN 3</td>
<td>Interpersonal Comm. Competence (D)</td>
<td>4</td>
<td>F   W  S</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LOWER DIVISION ENGLISH COMPOSITION requirement:** select ONE of the following seven courses (4 units required) (may not simultaneously fulfill GE topical breadth)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Qtr(s) Offered</th>
<th>Prerequisites &amp; Enrollment Restrictions</th>
<th>Notes and web links to resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>UWP 1, 1V, or 1Y</td>
<td>Expository Writing (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>Compl. of Entry Level Writing Req. (pass with C- or better)</td>
<td></td>
</tr>
<tr>
<td>ENL 3 (English)</td>
<td>Introduction to Literature (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>Compl. of Entry Level Writing Req. (pass with C- or better)</td>
<td></td>
</tr>
<tr>
<td>COM 1 (Comp Lit)</td>
<td>Bks of West. Cul:Ancient World (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>Compl. of Entry Level Writing Req. (pass with C- or better)</td>
<td></td>
</tr>
<tr>
<td>COM 2</td>
<td>Bks of West. Cul:Mid Ages-Enlight (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>Compl. of Entry Level Writing Req. (pass with C- or better)</td>
<td></td>
</tr>
<tr>
<td>COM 3</td>
<td>Bks of West. Cul:Modern Crisis (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>Compl. of Entry Level Writing Req. (pass with C- or better)</td>
<td></td>
</tr>
<tr>
<td>COM 4</td>
<td>Bks of the Contemporary World (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>Compl. of Entry Level Writing Req. (pass with C- or better)</td>
<td></td>
</tr>
<tr>
<td>NAS 5 (Native Amer St)</td>
<td>Intro to Native American Literature (d)</td>
<td>4</td>
<td>F   W  S</td>
<td>Compl. of Entry Level Writing Req. (pass with C- or better)</td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL EDUCATION (GE) requirement:**

GE requirements, GE worksheets, and popular GEIs can be found on our website: [http://cee.engr.ucdavis.edu/ge/](http://cee.engr.ucdavis.edu/ge/)  
GE 3 (for students entering the program Fall 2011 and on): ~27 additional units for Civil Engineering students.  
GE Course Look Up Tool: [http://registrar.ucdavis.edu/courses/ge_courses/](http://registrar.ucdavis.edu/courses/ge_courses/)  
GE may be taken anytime. Complete by graduation.

**Minimum Requirements for Change of Major in the College of Engineering:**

1. Finish at least one quarter at UCD  
2. Have fewer than 135 units  
3. Be in good academic standing and meet minimum progress  
4. Receive a letter grade for all courses that satisfy engineering degree requirements  
5. Complete at least the following five courses: MAT 21A, B, C, PHY 9A, and CHE 2A, and have a GPA of 2.00 or better in all completed MAT, PHY, BIS, and CHE courses required for your intended major, and receive a C- or better in each of these courses  

**MINIMUM 2.00 UC GPA and MINIMUM 2.00 ENGINEERING (Major) GPA required to receive degree certification.**


<table>
<thead>
<tr>
<th>Freshman (0-44.9 units)</th>
<th>Example Schedule</th>
<th>Sophomore (45-89.9 units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Winter</td>
<td>Spring</td>
</tr>
<tr>
<td>MAT 21A</td>
<td>MAT 21B</td>
<td>MAT 21C</td>
</tr>
<tr>
<td>English Elective</td>
<td>CHE 2A</td>
<td>PHY 9A</td>
</tr>
<tr>
<td>ECI 3</td>
<td>GE Elective</td>
<td>CHE 2B</td>
</tr>
<tr>
<td>(GE Elective)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12/16</td>
<td>17</td>
</tr>
</tbody>
</table>

* = Course open to Engineering students ONLY

^ = may take another quarter instead

: Course may be taken concurrently

L = Course has a Lab

D = Course has a Discussion

\(\_\_\_\) = Course open to Engineering students ONLY

\(\star\star\) = C- or better grade in this course is a prerequisite for most engineering coursework (both lower and upper division). It is always an instructor's option to drop students without the posted prerequisites for their course. Engineering instructors will exercise this option frequently.
### CIVIL ENGINEERING DEGREE REQUIREMENTS

**2015-2016**

#### ***UPPER DIVISION***

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Qtr(s) Offered</th>
<th>Prerequisites &amp; Enrollment Restrictions</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 102</td>
<td>Dynamics</td>
<td>4</td>
<td>F W S</td>
<td>ENG 35, MAT 22B both with C- or better</td>
<td></td>
</tr>
<tr>
<td>ENG 103*</td>
<td>Fluid Mechanics</td>
<td>4</td>
<td>F W S</td>
<td>ENG 35, MAT 22B, PHY 9B all with C- or better</td>
<td></td>
</tr>
<tr>
<td>ENG 104*</td>
<td>Mechanics of Materials</td>
<td>4</td>
<td>F W S</td>
<td>ENG 35, MAT 22B both with C- or better</td>
<td>Do not take lab concurrently.</td>
</tr>
<tr>
<td>ENG 104L</td>
<td>Mechanics of Materials Lab</td>
<td>1</td>
<td>W S</td>
<td>ENG 104</td>
<td></td>
</tr>
<tr>
<td>ENG 105</td>
<td>Thermodynamics</td>
<td>4</td>
<td>F W S</td>
<td>MAT 22B, PHY 9B both with C- or better</td>
<td></td>
</tr>
<tr>
<td>ENG 106</td>
<td>Engineering Economics</td>
<td>3</td>
<td>W</td>
<td>Upper division standing in Engineering</td>
<td></td>
</tr>
<tr>
<td>ECI 190</td>
<td>Civil Engineer in Society</td>
<td>2</td>
<td>W S</td>
<td>Upper division standing in Civil Engineering</td>
<td></td>
</tr>
<tr>
<td>ECI 114</td>
<td>Probabilities, Systems Analysis for Civ. Engrs.</td>
<td>4</td>
<td>W S</td>
<td>MAT 21C w/ C- or better; Pass 1 majors only</td>
<td></td>
</tr>
</tbody>
</table>

**Group Options**

- See box for requirement details

**Math Analysis**

- See box for requirement details

**ECI Elective**

- See box for requirement details

20 units required if ECI 3 not completed

#### GROUP OPTION requirement

Select 2 courses from 4 of the 5 areas below → 8 courses total

#### MAJOR DESIGN EXPERIENCE requirement

At least 2 courses from Group Option or ECI Elective must be from the following list:

- ECI 127, ECI 136, ECI 145, ECI 148B, ECI 150, ECI 162, ECI 173

**ENVIRONMENT:**

- ECI 148A* Water Quality Management 4 W CHE 2B w/ C- or better
- or ECI 149 Air Pollution Analysis 4 F MAT 21D & 22B; CHE 2B & ENG 103 both w/ C- or better

**and one or more of the following courses:**

- ECI 140 Env. Analysis of Aqueous Sys. 3 F CHE 2B
- ECI 143 Green Engr. Des. & Sustainability 4 F Upper division standing; Pass 1 majors only


- 4 W ENG 103, ECI 148A both w/ C- or better

**ECI 150 Air Pollution Cont. Sys. Design**

- 4 W ENG 103, 105 & 106; ECI 149

#### GEOENGINEERING:

- ECI 171**-171L Soil Mechanics & Lab 4/1 F S ENG 103 (MBTC); ENG 104 w/ C- or better; 171L concurrently

**and one or more of the following courses:**

- ECI 173 Foundation Design 4 W ECI 171
- ECI 175 Geotechnical Earthquake Engineering 4 W ECI 171 w/ C- or better
- ECI 179 Pavement Engineering 4 F ENG 104 w/ C- or better -ECI 179 may only count in one group-

#### STRUCTURES:

- ECI 130 Structural Analysis 4 F S ENG 104 w/ C- or better; MAT 22A

**and one or more of the following courses:**

- ECI 131 Matrix Structural Analysis 4 S ENG 104 w/ C- or better; ENG 6
- ECI 132 Struct. Design: Metallic Elem. 4 W ECI 130
- ECI 135 Struct Design: Concrete Elem. 4 W ECI 130; Restricted to Civil Eng majors

- ECI 136 Building Design 4 S ECI 130 or 131; ECI 132 or 135

**and one or more of the preceding or following courses:**

- ECI 137 Construction Prin. & Proj. Mgmt. 4 S Upper division standing in Engineering; ENG 106 recom
- ECI 138 Earthquake Loads on Structures 4 F ECI 130 or 131
- ECI 139 Advanced Structural Mechanics 4 not offered 15-16 ENG 104 w/ C- or better

#### TRANSPORTATION:

- ECI 161* Transportation System Operations 4 F ENG 6 (or equiv.), MAT 21C, & PHY 9A w/ C- or better
- or ECI 162 Transport Land Use Sustain. Design 4 S ECI 161 or 163 w/ C- or better in either

**and one or more of the preceding or following courses:**

- ECI 163* Energy/Env. Aspects of Trans. 4 not offered 15-16 ENG 106 or ECN 1A offered Fall '16
- ECI 165 Transportation Policy 3 F

#### WATER RESOURCES:

- ECI 141**-141L Engineering Hydraulics & Lab 3/1 F W ENG 103 w/ C- or better

**and one or more of the following courses:**

- ECI 142 Engineering Hydrology 4 not offered 15-16 ECI 141 (MBTC)
- ECI 144 Groundwater Systems Design 4 F ECI 141

**ECI 145 Hydraulic Structure Design**

- 4 S ECI 141 w/ C- or better

**ECI 146 Water Resources Simulation**

- 4 W ENG 103
- ECI 145 Water Resources Engrg. Planning 4 W ENG 106 or ECN 1A; ECI 114

**MATHEMATICAL ANALYSIS requirement**

Select ONE of the following four courses (4 units required)

- ECI 115 Computer Methods in Civil Eng 4 W ENG 6 or ECS 30; MAT 22B
- ECI 153 Deterministic Optimization & Design 4 F MAT 21C, 22A, programming course
- MAT 118A Partial Diff. Eqs/Elementary Methods 4 F MAT 21D, 22A, 22B (extensive problem solving)
- Statistics 108 Appl. Stat. Methods/Regression Analy 4 F W S Statistics 13, 32, 102 or ECI 114; Pass 1 STA majors only

(MBTC) = Course may be taken concurrently  
L = Course has a Lab  
D = Course has a Discussion  
* = Course open to Engineering students ONLY

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Offerings & prerequisites are subject to change  
**revised 8/31/2015**
Offerings & prerequisites are subject to change

CIVIL & ENVIRONMENTAL ENGINEERING ELECTIVE requirement: 16 units required — or 20 units required if ECI 3 is not completed

→ ECI Elective is additional upper division, letter-graded Civil & Environmental Engineering (ECI) courses (i.e. not already used towards the Group Option and Math Analysis requirements). ¹

May also include up to 6 units of the following:

→ ECI 198 ² Group Study (with Faculty) 1-5 F W S Upper division standing
→ ECI 199 ² Research (with Faculty) 1-5 F W S Upper division standing

¹A maximum of 4 units outside of Civil & Environmental Engineering may be considered on a petition basis. Please consult with an undergraduate staff adviser.

²Unit credit might be possible when working on a group project (ECI 198) or with a professor in the department on a research project (ECI 199). ECI 198 may be awarded to students involved with competition teams or other group projects. Students normally ask professors about research possibilities available to undergraduates. An ECI 198/199 form must be completed (including the portion filled in and signed by the professor) and returned by the student to the adviser to receive a CRN#. The form is available on our website: http://cee.engr.ucdavis.edu/forms/.

SUSTAINABILITY AND ENERGY electives (NOT required for graduation; units can be applied to ECI elective requirement)

ECI 123 Urban Systems & Sustainability 4 S Upper division standing
ECI 125 Building Energy Performance 4 S Upper division standing in Engineering
ECI 126 Green Planning 4 not offered 15-16 upper division standing; consent of instructor via application
ECI 127 Green Design ² 4 not offered 15-16 ECI 126 (126 & 127 taken as a sequence)

Planning for an EDUCATION ABROAD or QUARTER ABROAD or SUMMER ABROAD experience? http://studyabroad.ucdavis.edu

Engineering students are encouraged to participate in these programs; Civil Engineering Majors find that the curriculum allows the flexibility to include study abroad.

Close to Graduation? Two separate websites to visit – one for degree certification/diploma and one to participate in a ceremony:
1) Graduation Online Application (apply qtr before completing coursework): http://registrar.ucdavis.edu/graduation
2) Participate in Commencement (June or December ceremony): http://commencement.ucdavis.edu/registration.html

MINIMUM 2.00 UC GPA and MINIMUM 2.00 ENGINEERING (Major) GPA required to receive degree certification.

Academic Adviser Contact Information & Useful Websites:

Reina Smarkel, Undergraduate Academic Program Coordinator, Civil Engineering, 2045 Ghausi Hall, civiladvising@ucdavis.edu
Lisa Anderson, Undergraduate Academic Program Assistant, Civil Engineering, 2009 Ghausi Hall, civiladvising@ucdavis.edu

College of Engineering Undergraduate Dean’s Office, 1050 Kemper Hall Main phone number: 752-1979 Engineering Peer Advisers: 752-0553

Civil & Environmental Engineering: http://cee.engr.ucdavis.edu
OASIS Student Advising: http://oasis.ucdavis.edu

College of Engineering: http://engineering.ucdavis.edu
Advising Appointment System: https://appointments.ucdavis.edu/

Office of the Registrar (Online Catalog & more): http://registrar.ucdavis.edu
Schedule Builder: http://sisweb.ucdavis.edu/

Class Search Tool: http://classes.ucdavis.edu
Equivalent courses at Community Colleges: http://www.assist.org

Summer Sessions: http://summer-sessions.ucdavis.edu
Internship & Career Center: http://iceweb.ucdavis.edu

Undergrad Research Center: http://undergraduateresearch.ucdavis.edu

Academic Standing is determined by grade point average (GPA) from both the most recent quarter and the cumulative/UC GPA at the end of Fall, Winter and Spring Quarter; as well as units completed toward Minimum Progress (MP) (must average 13 units per quarter / total at least 39 units/year (Fall through Spring)).

Good Standing = GPA of 2.00 or above (quarterly and cumulatively) and satisfaction of MP.

Academic Probation (AP) = GPA less than 2.00, but not less than 1.50, for the quarter, and/or GPA less than 2.00 for all courses taken within UC, and/or MP average less than 13 units, but greater than or equal to 12 units per quarter.

Subject to Disqualification (SD) = GPA less than 1.50 for the quarter, and/or GPA less than 1.50 for all courses taken within UC, and/or MP average less than 12 units per quarter.

Course Repeat Policy - Students may repeat one time for credit a course in which they received a D+, D, D-, F or NP. The second (i.e. repeat) grade replaces the first grade in the GPA, up to a 16 unit maximum (course must be repeated at UC). After 16 units, both grades remain in the GPA. Both grades remain on the transcript for all repeated coursework. Repeating a course more than once requires approval by petition through the Dean’s Office.

--The Civil Engineering degree is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org -