

## CIVIL ENGINEERING & ENVIRONMENTAL ENGINEERING DOUBLE MAJOR REQUIREMENTS 2017-2018 LOWER DIVISION

Course	Title	Units	Otr(s)	Offered	Prerequisites & Enrollment Restrictions	Notes and web links to resources
MAT 21A*	Calculus <i>D</i>	4	F	W S	2 yrs high school algebra, trig, geometry & placement by exam	
MAT 21B*	Calculus <i>D</i>	4	F	W S	MAT 21A w/ C- or better	→ assistance in Math:
MAT 21C*	Calculus <i>D</i>	4	F	W S	MAT 21B w/ C- or better	<a href="https://www.math.ucdavis.edu/resources/learning/">https://www.math.ucdavis.edu/resources/learning/</a>
MAT 21D*	Vector Analysis <i>D</i>	4	F	W S	MAT 21C w/ C- or better	and <a href="http://success.ucdavis.edu">http://success.ucdavis.edu</a>
MAT 22A*	Linear Algebra	3	F	W S	MAT 21C w/ C- or better, Matlab (or MAT 22AL concurrently)	
MAT 22B*	Differential Equations	3	F	W S	MAT 22A w/ C- or better	
PHY 9A*	Classical Physics <i>LD</i>	5	F	S	MAT 21B	→ assistance in Physics:
PHY 9B*	Classical Physics <i>LD</i>	5	F	W	PHY 9A, MAT 21C; MAT 21D (MBTC)	<a href="http://success.ucdavis.edu">http://success.ucdavis.edu</a>
PHY 9C	Classical Physics <i>LD</i>	5	W	S	PHY 9B, MAT 21D; MAT 22A (MBTC)	
CHE 2A*	General Chemistry <i>LD</i>	5	F	W	Placement by exam score or prep path	→ assistance in Chem:
CHE 2B*	General Chemistry <i>LD</i>	5	W	S	CHE 2A w/ C- or better	<a href="http://success.ucdavis.edu">http://success.ucdavis.edu</a>
CHE 2C	General Chemistry <i>LD</i>	5	F	S	CHE 2B w/ C- or better	
ENG 35*	Statics <i>D</i>	4	F	W S	MAT 21D (MBTC), PHY 9A all with C- or better; <i>Pass 1 Engineering only</i>	
ECI 3	Civil Infrastructure and Society <i>L</i>	4	F		MAT 21A (MBTC) [Fresh/Soph course - or replace with 4 units of ECI Elective]	
ECI 16	Spatial Data Analysis <i>L</i>	2		S	Restricted to Civil and Bio Sys Eng majors	
ECI 40	Intro to Env. Engineering	4	F		CHE 2B; <i>Pass 1 Engineering only</i>	

<b>ATM or GEL elective:</b> select 1 of the following courses (3-4 units required)						
ATM 60	Intro Atmospheric Science <i>D</i>	4	F		MAT 21A, PHY 9A	
GEL 50	Physical Geology	3	F	W	High school phys & chem -reduced unit credit if GEL 1 completed -	

<b>PROGRAMMING requirement:</b> select 1 of the following courses (4 units required)						
ENG 6	Engineering Problem Solving (Matlab) <i>D</i>	4	F	W S	MAT 21A with C- or better; MAT 21B with C- or better (MBTC)	
ECS 30	Programming & Prob Solving (C) <i>D</i>	4	F	W S	MAT 21A (MBTC); <i>prior programming experience recomm/expected</i>	

<b>COMMUNICATION requirement:</b> select 1 of the following courses (4 units required)						
CMN 1	Intro to Public Speaking <i>D</i>	4	F	W S		
CMN 3	Interpersonal Commun. Competence <i>D</i>	4	F	W S		
ENG 3	Intro to Engineering Design <i>L</i>	4	F	W S	Compl. of Entry Level Writing Req.	

<b>LOWER DIVISION ENGLISH COMPOSITION requirement:</b> select 1 of the following courses (4 units required) (may not simultaneously fulfill GE topical breadth)						
UWP 1, 1V, or 1Y	Expository Writing <i>D</i>	4	F	W S	Compl. of Entry Level Writing Req.	(pass with C- or better)
ENL 3 (English)	Introduction to Literature <i>D</i>	4	F	W S	Compl. of Entry Level Writing Req.	(pass with C- or better)
COM 1 (Comp Lit)	Bks of West. Cul: Ancient World <i>D</i>	4	F	W S	Compl. of Entry Level Writing Req.	(pass with C- or better)
COM 2	Bks of West. Cul: Mid Ages-Enlight <i>D</i>	4	F	W S	Compl. of Entry Level Writing Req.	(pass with C- or better)
COM 3	Bks of West. Cul: Modern Crisis <i>D</i>	4	F	W S	Compl. of Entry Level Writing Req.	(pass with C- or better)
COM 4	Bks of the Contemporary World <i>D</i>	4	F	W S	Compl. of Entry Level Writing Req.	(pass with C- or better)
NAS 5 (Native Amer Std)	Intro to Native American Literature <i>D</i>	4	F	W S	Compl. of Entry Level Writing Req.	(pass with C- or better)

**GENERAL EDUCATION (GE) requirement:** ~13-17 additional units for Civil Engineering & Environmental Engineering double majors  
 GE requirements, worksheets, & popular options can be found at: <http://cee.engr.ucdavis.edu/ug-advising/ge/> GE may be taken anytime. Complete by graduation.

<b>Minimum Requirements for College of Engineering Change of Major or Double Major*:</b>						
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. a) Complete at least the following five courses: <b>MAT 21A, B, C, PHY 9A, and CHE 2A, and b) have a GPA of 2.00</b> or better in all completed <b>MAT, PHY, BIS, and CHE</b> courses required for your intended major, and receive a <b>C- or better</b> in each of these courses						
6. Have <b>no grade lower than a C-</b> in any completed <b>engineering course</b> required for your intended major(s) taken at UC Davis			7. Have a <b>2.00 UC GPA</b> in completed <b>engineering courses</b>			
*Requirements subject to change. See <a href="http://engineering.ucdavis.edu/undergraduate/advising/">http://engineering.ucdavis.edu/undergraduate/advising/</a> for current requirements.						

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

First-Year Seminar offerings: <http://fys.ucdavis.edu/student/index.html>

Freshman (0-44.9 units)				<i>Example Schedule</i>		Sophomore (45-89.9 units)			
Fall	Winter	Spring		Fall	Winter	Spring			
MAT 21A	MAT 21B	MAT 21C		MAT 21D	MAT 22A (22A Lab)3(1)	MAT 22B			
CHE 2A	CHE 2B	PHY 9A		PHY 9B	ENG 6 or ECS 30	ENG 35			
ECI 3	ENL Comp	CHE 2C		ECI 40	PHY 9C	ECI 16			
	GE Elective			GEL 50 or ATM 60	GE Elective	CMN 1/3 or ENG 3			
13		17			16	17(18)			13

(MBTC) = Course may be taken concurrently    L = Course has a Lab    D = Course has a Discussion

\* = 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 & ENVIRONMENTAL ENGINEERING DOUBLE MAJOR REQUIREMENTS 2017-2018  
UPPER DIVISION**

Course	Title	Units	Qtr(s)	Offered	Prerequisites & Enrollment Restrictions	Notes
ENG 103*	Fluid Mechanics <i>D</i>	4	F	W S	ENG 35, MAT 22B, PHY 9B all with C- or better	
ENG 104*	Mechanics of Materials	4	F	W S	ENG 35, MAT 22B both with C- or better	-Do not take 104L concurrently-
ENG 104L	Mechanics of Materials Lab	1		W S	ENG 104	-Do not take lab concurrently with ENG 104-
ENG 105	Thermodynamics <i>D</i>	4	F	W S	MAT 22B, PHY 9B both with C- or better	
ENG 106	Engineering Economics	3		W	Upper division standing in Engineering	
ECI 114	Probabilistic Sys. Analy. for Civ. Engrs.	4		W S	MAT 21C w/ C- or better; Pass 1 majors only	

**MATHEMATICAL ANALYSIS requirement:** select ONE of the following four courses (4 units required)

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

**ADDITIONAL ECI COURSES:**

CORE:						
ECI 140A*	Env. Analysis of Aqueous Sys. <i>L</i>	4	F		CHE 2B w/ C- or better; Pass 1 restricted to EENV (starting Fall 2018)	
ECI 140B*	Chem. Principles for Env. Eng.	4	F		CHE 2B w/ C- or better; ECI 140A&B not open to students who completed ECI 140	
ECI 140C*	Bio. Principles for Env. Eng.	4		W	ECI 140A w/ C- or better	
ECI 140D	Water Qual. Mgmt. Sys. Design <i>L</i>	4		S	ENG 103 or 100; ECI 140 or 140A or 140B or 140C or 148A both w/ C- or better	
ECI 123	Urban Systems & Sustainability	4		S	Upper division standing	
AIR:						
ECI 149*	Air Pollution <i>D</i>	4	F		MAT 21D & 22B; CHE 2B & ENG 103 both w/ C- or better	
ECI 150	Air Pollution Cont. Sys. Design <i>D</i>	4		W	ECI 149 w/ C- or better	
HYDRAULICS:						
ECI 141*-141L	Engineering Hydraulics & Lab	3/1	F	W	ENG 103 w/ C- or better	
ECI 145	Hydraulic Structure Design <i>L/D</i>	4		S	ECI 141 w/ C- or better	
Select one more from the following:						
ECI 142	Engineering Hydrology	4	F		ECI 141 (MBTC)	
ECI 144	Groundwater Systems Design	4		W	ECI 141	
ECI 146	Water Resources Simulation <i>D</i>	4		W	ENG 103	
ECI 155	Water Resources Engrg. Planning	4		W	ENG 106 or ECN 1A; ECI 114	
GEOTECHNICAL:						
ECI 171*-171L	Soil Mechanics & Lab	4/1		W S	ENG 103 (MBTC); ENG 104 w/ C- or better; 171L concurrently	
STRUCTURES or TRANSPORTATION select one of the following:						
ECI 130	Structural Analysis	4	F	S	ENG 104 w/ C- or better; MAT 22A	
ECI 161*	Transportation System Operations <i>D</i>	4	F		MAT 21C & PHY 9A w/ C- or better	
ECI 163*	Energy/Env. Aspects of Trans.	4		not offered 17-18	ENG 106 or ECN 1A offered Fall '18 – even years only	
ECI 165	Transportation Policy	3	F		offered Fall '17 and '19 – odd years only	

**Senior Design Experience (SDE) Requirement:** (8 units required) courses must be taken consecutively & must be in final year of study

ECI 193A	ECI Senior Design <i>L</i>	4		W	(ECI 140D) or (ECI 171/ 171L) or (ECI 132 or ECI 135) or (ECI 161 or 163) or (ECI 141/141L); and one other ECI Depth course, all w/ C- or better	
ECI 193B	ECI Senior Design <i>L</i>	4		S	ECI 193A – In Progress Grading for ECI 193A&B – final grades posted in Spring	

**UPPER DIVISION ENGLISH COMPOSITION requirement:** satisfy by Exam (0 units) - or take ONE of the UWP courses listed below (4 units)

**English Composition Exam** (given 4<sup>th</sup> Saturday of each quarter – no more than 2 chances to pass the exam – low pass rate in recent offerings)

Exam details at: <http://writing.ucdavis.edu/compexam>

UWP 101	Advanced Composition <i>D</i>	4	F	W S	UWP 1 or ENL 3; Upper div. standing	(pass with C- or better)
UWP 102E	Writing in the Disciplines: <u>Engineering</u> <i>D</i>	4	F	W S	UWP 1 or ENL 3; Upper div. standing	(pass with C- or better)
UWP 102G	Writing in the Disciplines: <u>Environmental Writing</u> <i>D</i>	4		S	UWP 1 or ENL 3; Upper div. standing	(pass with C- or better)
UWP 104A	Writing in the Professions: <u>Business Writing</u> <i>D</i>	4	F	W S	UWP 1 or ENL 3; Upper div. standing	(pass with C- or better)
UWP 104E	Writing in the Professions: <u>Science</u> <i>D</i>	4	F	W S	UWP 1 or ENL 3; Upper div. standing	(pass with C- or better)
UWP 104T	Writing in the Professions: <u>Technical Writing</u> <i>D</i>	4	F	W S	UWP 1 or ENL 3; Upper div. standing	(pass with C- or better)

Junior (90-134.9 units)				Example Schedule				Senior (135 or more units)			
Fall		Winter		Spring		Fall		Winter		Spring	
ENG 103	4	ECI 141&L	4	ECI 140D	4	ENG 105	4	ECI 193A	4	ECI 193B	4
ECI 140A	4	ECI 140C	4	ECI 123	4	ECI 149	4	ECI 150	4	ECI 145	4
ECI 140B	4	ENG 106	3	ECI 171&L	5	Water Depth	5	ECI 114	4	Math Anal. Elec.	4
GE Elective	4	ENG 104	4	Upper Div Comp	4	ECI 130 or 161/3/5	3-4	ENG 104L	1	(URE	2)
	16		15	(or GE elective)	17		16-17		13		12-14

URE = Unrestricted Elective