

Watershed Science (Old)

Why study watershed science?

The watershed science track trains students in the principles of hydrology, climate as it relates to water, water law, appropriate areas of public policy, and links to ecology and soils. Water is a key resource in the western US and in much of the developed World. Watersheds are the natural geographic unit for water management and science, and encompass issues like water quality, water supply, flood management, biodiversity, and climate change. The multiple factors involved with watersheds provide experience for several different career tracks. Students are likely to pursue careers in water and watershed management, environmental consulting, government agencies, and environmental non-profits. The track is also very good preparation for graduate school in ecology, hydrology, environmental policy, or especially interdisciplinary environmental management programs. Law school is also a very good option for those students who take the appropriate social sciences and law classes and electives.



Preparatory Subject Matter Requirements

Preparatory Subject Matter		Quarter(s) Offered	Units	Completed	Notes
Written and Oral Expression					
UWP 101, or any from the 102 or 104 series	Upper Division Writing	I, II, III, IV	4	_____	<u>May test out of requirement</u>
CMN 1, 3V, 3Y, or DRA 10	Communication	I, II, III, IV	4	_____	_____
Biological Sciences					
BIS 2A	Essentials of Life on Earth	I, II, III, IV	5	_____	_____
BIS 2B	Principles of Ecology and Evolution	I, II, III, IV	5	_____	_____
BIS 2C	Biodiversity and the Tree of Life	I, II, III, IV	5	_____	_____
Geology					
<i>Choose one of the following</i>					
GEL 1	The Earth	I, II, III	4	_____	_____
GEL 50 (recommended)	Physical Geology	I, II, III	3	_____	_____
Chemistry					
CHE 2A or 2AH	General Chemistry	I, II, IV	5	_____	_____
CHE 2B or 2BH	General Chemistry	II, III, IV	5	_____	_____
Physics					
<i>Complete either 1AB or 7ABC</i>					
PHY 1A	General Physics	I, II, IV	3	_____	_____
PHY 1B	General Physics	II, III	3	_____	_____
PHY 7A	General Physics	I, II, III, IV	4	_____	_____
PHY 7B	General Physics	I, II, III, IV	4	_____	_____
PHY 7C	General Physics	I, II, III, IV	4	_____	_____
Economics					
ECN 1A, 1AV, or 1AY	Principles of Microeconomics	I, II, III, IV	4	_____	_____
Mathematics					
MAT 16A and 16B	Short Calculus	I, II, III, IV	3, 3	_____	<u>Being phased out as of 23-24</u>
MAT 17A and 17B	Calculus for Biology & Medicine	I, II, III, IV	4, 4	_____	<u>MAT 17AB recommended</u>
MAT 19A and 19B and 19C	Calculus for Data-Driven Applications	I, II, III, IV	4, 4, 4	_____	<u>Must take A, B, and C</u>
MAT 21A and 21B	Calculus	I, II, III, IV	4, 4	_____	_____
Environmental Science and Policy					
ESP 1	Environmental Analysis	I, IV	4	_____	_____

I = fall quarter, II = winter quarter, III = spring quarter, IV = summer session

*Course is offered in odd years only (2023, 2025, etc.)

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Core Subject Matter Requirements

NOTE: Students graduating with this major are required to attain at least a C average (2.0 GPA) in all courses taken at the university in Depth Subject Matter *and* pass all coursework. See requirements of the College of Agriculture & Environmental Science in the UC Davis General Catalog.

Depth Subject Matter	Prerequisites	Qtr(s)	Units	Completed	
Global Environment					
ESM 120	Global Environmental Interactions	One college-level chemistry and biology course	II	4	_____
Ecology					
<i>(Choose one of the following)</i>					
ESP 100	General Ecology	BIS 2A-C; MAT 16A-B or 17A-B or 21A-B; STA 13 recommended	I, II, IV	4	_____
EVE 101	Introduction to Ecology	BIS 2A-C; MAT 16A-B or 17A-B or 21A-B; or equivalent	I, II, III, IV	4	_____
Policy					
ESP 162	Environmental Policy	ECN 1A or ECN 1AV or ECN 1AY	II	4	_____
Statistics					
<i>(Choose one of the following – Statistics 100 recommended)</i>					
STA 13	Elementary Statistics	Two years of high school algebra or equivalent in college	I, II, III, IV	4	_____
STA 100	Applied Statistics for Biological Sciences	MAT 16B or 17B or 21B with a C- or better	I, II, III, IV	4	_____
Environmental Monitoring					
<i>(Choose one of the following)</i>					
ATM 124	Meteorological Instruments & Observations	ATM 60	I	3	_____
ESM 108	Environmental Monitoring	ESP 100 or EVE 101 or SSC 100 or WFC 100 or equivalent	III	3	_____
ESP 151L	Limnology Lab	ESP 151 (can be concurrent)	III	3	_____
ESP 179	Environmental Impact Assessment	ESP 1 or the equivalent	II, IV	4	_____
Environmental Data Science					
<i>(Choose one of the following)</i>					
ABT/LDA 150	Introduction to GIS	None	I, II, III	4	_____
ESP 106	Environmental Data Science	STA 13 or 32 or 100 recommended	II	4	_____
Internship					
ESM/ESP 92/192	Internship	Upper division standing, permission of instructor Variable unit – must take at least 3 units of internship May complete internship in a different area with prior approval (e.g.: PLS, SSC, ATM)	I, II, III, IV	3	_____
Capstone					
ESM 195	Integrating Env Science & Management	Senior standing in ESM	III	2	_____
Honors Thesis (Optional)					
ESM 194H	Senior Honors Thesis	Senior standing, Overall GPA of 3.50 or higher; Consent of the lead faculty advisor		2-6	_____

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Watershed Science

Required Courses		Prerequisites	Qtr(s)	Units	Completed
Select one course					
HYD 10	Water, Power, Society	None	III	3	_____
ESM 121	Water Science & Management	PHY 10 or GEL 1	III	3	_____
Complete					
SSC 100	Principles of Soil Science	College-level course in each of CHE, PHY, BIS, and GEL recommended	I	5	_____
Select two hydrology courses					
ESM 100 or HYD 141	Principles of Hydrologic Science Physical Hydrology	CHE 2B; MAT 16B; PHY 7A or 9A PHY 9B, MAT 21B	I I	4 4	_____ _____
ESM 108	Environmental Monitoring	ESP 100 or EVE 101 or SSC 100 or WFC 100 or equivalent	III	3	_____
HYD 142	Systems Hydrology	HYD 141 or ECI 142		4	_____
HYD 143**	Echohydrology	HYD 10 or 141 or ESP 1 or ESM 100 or ESM 108 or ESM 120 or GEL 1 or 50 or SSC 100	II	4	_____
HYD 145	Water Science and Design	HYD 141 or ESM 100; MAT 16B or 21B; or consent of instructor	II	4	_____
Note: Cannot complete this section with ESM 100 and HYD 141					
Select one geology course					
ESP 151L	Limnology Lab	ESP 151 (can be concurrent)	III	3	_____
GEL 35	Rivers	None	III	3	_____
GEL 136	Ecogeomorphology of Rivers & Streams	Enrollment by application only, not offered every year	III	5	_____
GEL 140**	Intro to Process Geomorphology	GEL 1 or 50; MAT 16B or 17B or 21B	I	4	_____
Select one GIS course					
ABT 181N*	Concepts & Methods in GIS	LDA 150 or consent of instructor	II	4	_____
ABT/HYD 182**	Environmental Analysis with GIS	ABT 150 or equiv GIS experience, biology and/or ecology courses rec.	II	4	_____
Select one soil science course					
SSC 105	Field Studies of Soils in CA Ecosystems	SSC 100 and 120 or equivalent recommended	IV	5	_____
SSC 118	Soils in Land Use & the Environment	SSC 100 or equivalent recommended	III	4	_____
SSC 120	Soil Genesis, Morphology, & Classification	SSC 100; GEL 50 recommended	III	5	_____
Select two environmental studies courses					
ESP 166	Ocean & Coastal Policy	ESP 1 recommended	I	3	_____
ESP 168A	Methods of Env Policy Analysis	ESP 1 or 10; STA 13 or 100; ECN 1A or 1AV; ECN 100A recommended	I	5	_____
ESP 169**	Water Policy & Politics	POL 1 or ECN 1A recommended	III	3	_____
ESP 172	Public Lands Management	ECN 1A and POL 1 recommended	I	4	_____
ESP 174	Environmental Justice Policy and Practice	ESP 1 or the equivalent recommended	III	4	_____
ESP 179	Environmental Impact Assessment	ESP 1 or the equivalent	II, IV	4	_____
HYD 150	Water Law	Consent of instructor or upper division standing	II	3	_____
SOC 160	Sociology of the Environment	SOC 1, 2, or 3 recommended	Varies	4	_____
Complete					
ATM 133	Biometeorology	MAT 16B; one course in a biological discipline or consent of instructor	II	4	_____
Select one aquatic habitats course					
ESP 151	Limnology	BIS 2A and 2B; BIS 2C and ESP 100 or EVE 101 recommended	III	4	_____
EVE 115*	Marine Ecology	ESP 100, EVE 101, or BIS 2B, or consent of instructor	II	4	_____
WFC 120	Biology & Conservation of Fishes	BIS 2A-C; upper division ecology course recommended	I	3	_____
WFC 134	Herpetology	BIS 2A-C; upper division ecology course recommended	II	3	_____

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