Watershed Science

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, 102A-G, 104A-F	Upper Division Writing	I, II, III, IV	4		May test out of requirement UWP 102G, Env Writing, offered I, III
CMN 1, 3, or DRA 10	Public Speaking	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					
Choose one of the following					
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		
CHE 2C or 2CH (recommended, not required)	General Chemistry	I, III, IV	5		
Physics					
Complete either 1AB or 7ABC					
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	Principles of Microeconomics	I, II, III, IV	4		
Mathematics					
MAT 16A, 17A, or 21A	Calculus	I, II, III, IV	3-4		MAT 17AB recommended
MAT 16B, 17B, or 21B	Calculus	I, II, III, IV	3-4		
Environmental Science and Policy					
ESP 1	Environmental Analysis	I	4		

I = fall quarter, II = winter quarter, III = spring quarter, IV = summer session
*Course is offered in odd years only (2017, 2019, etc.)
**Course is offered in even years only (2016, 2018, etc.)

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 (29-32 Units)		Prerequisites	Qtr(s)	Units	Completed
Global Environment					
ESM 120	Global Environmental Interactions	One college-level chemistry and biology course	II	4	
Ecology					
(Choose one of the following)					
ESP 100	General Ecology	BIS 2A-C and MAT 16A-B, STA 13 recommended	I, III	4	
EVE 101	Introduction to Ecology	BIS 2A-C and MAT 16A-B or the equivalent	I, II, III, IV	4	
Policy					
ESP 162	Environmental Policy	ECN 1A	II	4	
Statistics					
(Choose one of the following – Statistics 100 recommended)					
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 the equivalent	I, II, III, IV	4	
Environmental Monitoring					
(Choose one of the following)					
ESM 108	Environmental Monitoring	Entry level course in the environmental sciences	III	3	
ESP 179	Environmental Impact Assessment	Upper division standing, one course in environmental science	II, IV	4	
GIS Technology					
ABT/LDA 150	Introduction to GIS	PLS 21 or equivalent with consent of instructor	I, III	4	
Internship					
ESM/ESP 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; Environmental science major (e.g.: ESM, EPAP, ETX, WFC)	III	2	
Honors Thesis *(Optional)*					
ESM 194H	Senior Honors Thesis	Senior standing, Overall GPA of 3.50 or higher; Consent of the master adviser		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	CHE 2A-B, PHY 1A-B, BIS 2A; GEL 50, BIS 2C recommended	I	5	
Select two hydrology courses					
ESM 100 or	Principles of Hydrologic Science	CHE 2B; Math 16B; PHY 7A or 9A	I	4	
HYD 141	Physical Hydrology	PHY 9B, MAT 21B	I	4	
HYD 151* or	Field Methods in Hydrology	ESM 100 or 141	II	4	
ESM 108	Environmental Monitoring	Entry level course in the environmental sciences	III	3	
HYD 142	Systems Hydrology	HYD 141	II	4	
HYD 143**	Hydrological Processes in Ecosystems	HYD 141 or ESM 100	II	3	
Note: Cannot complete this section with ESM 100 *and* HYD 141, or HYD 151 *and* ESM 108					
Select one geology course					
GEL 140	Intro to Process Geomorphology	GEL 1 or 50	I	4	
GEL 136†	Ecogeomorphology of Rivers & Streams	Upper division or graduate standing and consent of instructor		5	
Select one GIS course					
ABT 181N*	Concepts & Methods in GIS	ABT 150 or LDA 50 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, 120, or equivalent recommended	IV	5	
SSC 118	Soils in Land Use & the Environment	SSC 100 or consent of instructor	III	4	
SSC 120	Soil Genesis, Morphology, & Classification	SSC 100; GEL 50 recommended	III	5	
Select two environmental studies courses					
LDA 60	Grading & Drainage	LDA 1, 21, 30, 70	III	4	
ESP 166N**	Ocean & Coastal Policy	ESP 1	II	3	
ESP 168A	Methods of Env Policy Evaluation	STA 13; ECN 100 or ARE 100A; MAT 16B, 17B, or 21B; ESP 1	I	5	
ESP 169**	Water Policy & Politics	POL 1 or ECN 1A	III	3	
ESP 172	Public Lands Management	ECN 1A	I	4	
ESP 179	Environmental Impact Assessment	Upper division standing; one course in environmental science	II, IV	4	
HYD 150	Water Law	ESM 100 or 121 or consent of instructor	II	3	
SOC 160	Sociology of the Environment	Upper division standing in Sociology strongly recommended	II	4	
Complete					
ATM 133	Biometeorology	One biological course; MAT 16B; or consent of instructor	II	4	
Select one aquatic habitats course					
ENT 116	Biology of Aquatic Insects	BIS 2B or equivalent	III	3	
EVE 115*	Marine Ecology	ESP 100, EVE 101, or BIS 2B	II	4	
WFC 120	Biology & Conservation of Fishes	BIS 2A-C	I	3	

† Future availability unknown

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