

# HYDROLOGY, BACHELOR OF SCIENCE

College of Agricultural & Environmental Sciences

Faculty (<http://lawr.ucdavis.edu/people/faculty/hydrology/>)

## The Major Program

Hydrology is the study of the occurrence, distribution, circulation, and behavior of water and water-borne materials in the environment of Earth. It includes practical measurement and technical analysis of water phenomena underground, on the Earth's surface, and in the atmosphere. Contemporary hydrologic problems include environmental restoration, sustainability of groundwater and surface water resources, water pollution, and natural disasters such as floods, droughts, landslides, avalanches, and land subsidence. The management of these problems demands hydrologic scientists with the comprehensive, interdisciplinary education embodied in this program. Beyond its societal utility, hydrology can be an exciting science for the curious-minded. Hydrologists explore natural phenomena such as climate change, waterfalls, health of coral reefs, biogeochemical cycles, and aquifers.

## The Program

A hydrologist needs a strong background across the basic sciences of physics, mathematics, chemistry, and biology. Breadth of understanding comes from exposure to ecology, geology, engineering, policy, and law. Depth of experience is provided by core hydrology courses, internship opportunities, and practical outdoor training. Students choose electives to match their interests and career goals. Transfer students should have completed as much as possible of the preparatory subject matter listed below.

## Internships and Career Alternatives

Job opportunities in hydrology exceed the available supply of trained hydrologists. Students commonly obtain internships and jobs with state and federal agencies, private consulting firms, environmental interest groups, irrigation districts, and utility companies. Federal agencies hiring hydrologists include the U.S. Geological Survey, U.S. Department of Agriculture (Fish & Wildlife, Agricultural Research, Forest Service, and National Resource Conservation Service), Environmental Protection Agency, and national research laboratories (Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory). State and local agency employers include California's Departments of Water Resources, Conservation, Fish & Game, and Toxic Substances as well as the Water Resources Control Board and Regional Water Quality Control Boards. To obtain higher levels of responsibility and salary, hydrologists often seek advanced degrees, and the hydrology major is designed to provide students with a highly competitive education to get into graduate school.

## Lead Faculty Advisor

Isaya Kisekka (Land, Air & Water Resources)

## Hydrology Major Advisor

Lacole Brooks ([lbrooks@ucdavis.edu](mailto:lbrooks@ucdavis.edu))

## Advising Center

1150 PES Building

Code	Title	Units
<b>Preparatory Subject Matter</b>		
<i>Biological Science</i>		
BIS 002A	Introduction to Biology: Essentials of Life on Earth	5
BIS 002B	Introduction to Biology: Principles of Ecology & Evolution	5
<i>Chemistry</i>		
CHE 002A	General Chemistry	5
CHE 002B	General Chemistry	5
CHE 002C	General Chemistry	5
<i>Physics</i>		
PHY 009A	Classical Physics	5
PHY 009B	Classical Physics	5
PHY 009C	Classical Physics	5
<i>Mathematics</i>		
MAT 021A	Calculus	4
MAT 021B	Calculus	4
MAT 021C	Calculus	4
MAT 021D	Vector Analysis	4
MAT 022A	Linear Algebra	3
MAT 022B	Differential Equations	3
<i>Geology</i>		
GEL 050	Physical Geology	3
GEL 050L	Physical Geology Laboratory	2
Choose one:		4
ENG 006	Engineering Problem Solving	
ECS 032A	Introduction to Programming	
Preparatory Subject Matter Subtotal		71
<b>Depth Subject Matter</b>		
Choose one:		4
ECI 100	Introduction to Fluid Mechanics for Civil & Environmental Engineers	
ENG 103	Fluid Mechanics	
Equivalent of either.		
Choose ECI 114 or STA 130 series:		4-8
ECI 114	Probabilistic Systems Analysis for Civil & Environmental Engineers	
or STA 130A & STA 130B	Mathematical Statistics: Brief Course and Mathematical Statistics: Brief Course	
<i>Hydrology</i>		
HYD 134	Aqueous Geochemistry	6
HYD 141	Physical Hydrology	4
HYD/EBS 144	Groundwater Hydrology	4
ESM 108	Environmental Monitoring	3-4
or HYD 151	Field Methods in Hydrology	
<i>Soil Science</i>		
SSC 107	Soil Physics	5
<i>Water Policy &amp; Law</i>		
Choose one:		3-4
HYD 150	Water Law	
ARE 147	Resource & Environment Policy Analysis	
ESP 161	Environmental Law	

ESP 169	Water Policy & Politics	
ESM 121	Water Science & Management	
<i>GIS &amp; Remote Sensing</i>		
Choose one:		4-5
LDA/ABT 150	Introduction to Geographic Information Systems	
HYD/ABT 182	Environmental Analysis using GIS	
ESM 185	Aerial Photo Interpretation & Remote Sensing	
ESM 186	Environmental Remote Sensing	
<i>Hydrologic Science</i>		
Choose three:		8-13
HYD/ESM/ABT 110	Irrigation Systems & Water Management	
HYD 118/ EBS 148/ESM 118	Evapotranspiration Principles, Measurement & Modeling	
HYD 124	Plant-Water-Soil Relationships	
HYD 143	Ecohydrology	
HYD 145	Water Science & Design	
HYD 146/GEL 156	Hydrogeology & Contaminant Transport	
ECI 141	Engineering Hydraulics	
Depth Subject Matter Subtotal		45-57
<b>Restricted Courses</b>		
Upper division courses to supplement or expand areas of student interest selected with approval of advisor.		16-26
Restricted Courses Subtotal		16-26
<b>Total Units</b>		<b>132-154</b>