

Portland State University
Graduate Certificate in Hydrology
(Prior to Fall 2017)

The Graduate Certificate of Hydrology is designed to give students advanced training in hydrology, and leads to professional certification with the American Institute of Hydrology (AIH).

Trained hydrologic professionals are necessary to solve problems concerning drinking water supplies, stream habitat and water supply requirements for important aquatic organisms, the variability of climate and its effect on water supplies and hazards, and the threat posed to all these resources by industrial, agricultural and domestic contamination and overuse.

Employment possibilities include federal, state and local governmental agencies; commercial and industrial corporations in the private sector; and private consulting firms knowledgeable in hydrogeologic regulations, wetland mitigations, environmental regulations, flood prediction, pollution abatement and bioremediation, environmental site audits, and regulatory compliance.

This Certificate program enhances professional development and can put students in a better position either to pursue a graduate degree and/or to pursue certification as a professional hydrologist with the AIH. A student earning a Graduate Certificate in Hydrology achieves a significant proportion of educational requirements and satisfies all primary hydrology coursework for qualification as a member of the AIH.

Program Goals

The goals of this Certificate program are:

- o A conceptual foundation surface hydrology, hydrogeology and water quality.
- o Competence in solving quantitative and qualitative hydrologic problems.
- o Completion of primary hydrological education requirements for certification as a Professional Hydrologist with AIH.

Admission Requirements

All PSU Graduate Certificate programs require admission by the University. Applicants must have a bachelor's degree from an accredited institution and a cumulative GPA of at least 2.75 in all undergraduate courses. Applicants with cumulative undergraduate GPAs between 2.50 and 2.74 may be considered for conditional admission only.

Department admission requirements for this Graduate Certificate include 8 undergraduate credits each in physics, chemistry and calculus. Applicants may be considered for a conditional admission. No prior coursework in hydrology is necessary for admission.

Course Requirements

Course requirements for this Certificate include successful completion of one of three surface hydrology core courses (4 credits total); one of two hydrogeology core courses (4 credits total); one of three water quality core courses (4 credits total); an additional Category I course (4 credits total); and two Category II courses (8 credits total), for 24 total credits (6 total courses).

Currently this certificate cannot be completed fully online.

Surface Hydrology Core Courses: (Select one course)

CE 564, Hydrologic and Hydraulic Modeling, 4 credits (Spring Term)

CE 565, Watershed Hydrology, 4 credits (Fall Term)

ESM 525, Watershed Hydrology, 4 credits (Fall Term)

Hydrogeology Core Courses: (Select one course)

CE 569, Intro to Subsurface Flow and Contaminant Transport, 4 credits (Fall Term)

G 543, Ground Water Geology, 4 credits (Fall Term)

Water Quality Core Course: (Select one course)

BI 575, Limnology, 4 credits (Fall Term)

****ESM 575**, Limnology, 4 credits (Fall Term) will also count towards Water Quality Core Course requirement

CE 578, Water Quality Modeling, 4 credits (Fall Term)

G 548, Chemical Hydrogeology, 4 credits (Winter Term)

Category I courses: (Select one course)

Hydrology specialty area:

CE 561, Water Resources Systems Analysis, 4 credits (Winter Term)*

CE 564, Hydrologic and Hydraulic Modeling, 4 credits (Spring Term)

CE 565, Watershed Hydrology, 4 credits (Fall Term)

CE 566, Environmental Data Analysis, 4 credits (Fall Term)

CE 567, Hydrologic and Hydraulic Design, 4 credits (Spring Term)

CE 572, Environmental Fluid Mechanics I, 4 credits (Fall Term)

CE 573, Numerical Methods in Environmental and Water Res Engineering, 4 credits, (Spring Term)

CE 576, Environmental Fluid Mechanics II, 4 credits, (Winter Term)

ESM 525, Watershed Hydrology, 4 credits (Fall Term)

GEOG 514, Hydrology (emphasizes hydrometeorology), 4 credits (Fall Term)

Hydrogeology specialty areas:

CE 569, Introduction to Subsurface Flow and Contam Transport, 4 credits (Fall Term)

CE 570, Numerical Modeling of Subsurface Flow and Contam Transport, 4 credits (Winter Term)

G 541, Ground Water Modeling, 4 credits (Winter Term)*

G 543, Ground Water Geology, 4 credits (Fall Term)

G 544, Well Dynamics, 4 credits (Spring Term)*

G 548, Chemical Hydrogeology, 4 credits (Winter Term)*

Water Quality Specialty Area:

BI 575, Limnology, 4 credits (Fall Term)

****ESM 575**, Limnology, 4 credits (Fall Term) will also count towards Water Quality Specialty Area requirement

BI 577, Limnology Laboratory, 4 credits (Fall Term)

****ESM 577**, Limnology Laboratory, 2 credits (Fall Term) will also count towards Water Quality Specialty Area requirement

CE 578, Water Quality Modeling, 4 credits (Fall Term)

ESM 524, Ecological Toxicology, 4 credits (Winter Term)

ESM 526, Ecology of Streams and Rivers, 4 credits (Fall Term)

G 545, Geochemistry, 4 credits (Spring Term)

Category II courses: (Select two courses)

Hydrology and Hydrogeology specialty areas:

GEOG 511, Climatic Analysis, 4 credits (Spring Term)

GEOG 512, Geomorphology, 4 credits (Fall Term)

GEOG 546, Water Resource Management, 4 credits (Fall Term)

GEOG 582, Environmental Remote Sensing, 4 credits (Fall Term)

G 520, Applied Geophysics, 4 credits (Spring Term)

G 521, Fluid/Rock Interactions, 4 credits (Fall Term)*

G 547, Sedimentology, 4 credits (Fall Term)*

G 561, Environmental Geology, 4 credits (Winter Term)*

G 570, Engineering Geology, 4 credits (Winter Term)*

G 571, Advanced Engineering Geology, 4 credits (Spring Term)*

G 574, Geomorphic Processes, 4 credits (Spring Term)

PH 626, Hydrodynamics, 4 credits (Fall Term)*

Water Quality specialty areas:

BI 523, Microbial Ecology, 4 credits (Winter Term)

BI 545, Algal Physiology, 4 credits (Spring Term)

CE 574, Unit Operations of Environmental Engineering, 4 credits (Fall Term)

ESM 524, Wetland Ecology, 4 credits (Spring Term)

** Indicates an alternate year course offering*

For course descriptions, please see the PSU bulletin.

Courses must be completed within seven years of the award of Graduate Certificate, and a cumulative GPA of 3.000 must be attained in all courses to be used for the Certificate. At least two thirds of the credits for the Graduate Certificate or 15 credits, whichever is larger, are required to be taken at Portland State University.