

URBAN 584/IPM 510 Course Introduction

This is an online survey course designed to introduce water resources and water-related infrastructure systems. This course will provide you with the ability to view water and especially freshwater as a very essential and limited resource. It will also help you understand the relationship between water resources and drinking water, stormwater and wastewater management. You will also learn how water distribution is changing as our climate changes as well as explore the consequences of these changes. Finally, you will gain insight into intergovernmental policy, programs, and relationships; management strategies and tools; and their effect on water resources.

Lessons will be provided online. We will meet real time in an online meeting at the beginning of the course to introduce ourselves, and will present our final projects in an online meeting at the end of the course. Special accommodations will be made to include students in different time zones.

Course Preview

- 4 modules
- 10 lessons
- 4 individual assignments
- 6 team assignments (5 plus final project) with 1 problem-specific forum per team for posting team assignments that culminate in final project

Course Objectives

At the end of the course, you will be able to use the knowledge and skills you are building to

- discuss the properties and dynamics of water;
- identify freshwater ecosystem services, and management opportunities;
- apply the elements of risk management and risk-reduction to water-related issues;
- describe existing organizational arrangements and plans of governmental, non-profit, and private organizations to deal water issues and water policy;
- synthesize information and provide cogent briefings on water issues and water policy;
- develop and defend a strategy for a problem students generated, developed and refined as they progressed through the course.

Requirements

Before taking this systems course you should have an overall understanding of critical infrastructure and strategic planning through the completion of the four core courses listed below.

Course Prerequisites

Completion of the following core-curriculum courses:

- URBAN 581/IPM 502: Introduction to Infrastructure Systems
- URBAN 588/IPM 500: Strategic Planning and Policy Analysis
- URBAN 563/IPM 505: Climate Change and
- URBAN 571/IPM 503: Infrastructure Finance

The methods course IPM 508: Risk Assessment and Business Continuity is also recommended.

Completion Requirements

To successfully complete this course, you must do the following:

- read this course introduction and the lesson materials;
- complete and submit all written assignments; and
- participate in specified team activities.

About this Course

Required Materials

Texts

- Grafton, R., K. Hussey (eds). 2011. *Water Resources Planning and Management*. Cambridge: Cambridge University Press. (Available as E-Book via UW Libraries; see Module 2/Lesson 3 for access instructions.)

Additional readings will be provided to support each module.

Online Resources

Other resources will be available in each lesson's resources area and will include the following:

- [Stockholm International Water Institute](#)
- [UN-Water](#)
- [Global Water Partnership](#)
- [EPA-Sustainable Water Infrastructure](#)
- [PLANNERS AND WATER, PAS 588](#)
- Video: [Water Undone: Discussion of the Puyallup River](#)

Course Organization

The course is organized around four modules containing ten lessons. Your activity will involve both team and individual work.

Module I, Weeks 1-2: Water resources and issues

- Water availability, distribution and consumption
- Pressures and issues involving water and water supply

Module II, Weeks 3-5: Water science

- Hydrologic cycle and watersheds – delineation, scales, role as planning framework
- Physical, chemical and ecological water dynamics, ecosystem services
- Relationship between freshwater ecosystems and water infrastructure

Module III, Weeks 6-7: Water management concepts

- Three frameworks: Risks and Opportunities Assessment, Ecosystem Service Management, Integrated Water Resource Management / One Water
- Water law, markets and finance

Module IV, Weeks 8-10: Water management strategies

- Water-sensitive planning practice
- Explore real world strategies through case studies
- Adaptive management and resilience planning

About the Assignments

There are three types of assignments in this course:

- *4 individual assignments*

These assignments are of various formats and include one brief quiz on the readings and 3 short paper assignments.

- *6 team assignments with 1 problem-specific forum per team for posting team assignments that culminate in the final project*

Each team member will contribute to the discussion topic described in the course, and one person will synthesize the discussion as a final post to the discussion thread.

- *Final project*

Strategy for addressing water infrastructure problem. Each team will prepare a presentation that combines the final posts for each discussion topic and includes supporting material (relevant maps, graphics, statistics, case studies, etc.), and will argue a strategy for addressing the defined water problem.

The following is an overview of topics and assignments; readings and other resources are detailed in the lesson resources areas. For each module, a module description will be provided that includes detailed reading citations and pages and assignment instructions. The module descriptions will be structured into lessons that synthesize the readings and emphasize key points.

Week	Lesson Topic	Assignment
Module I : Water resources and issues		
Week 1	Introduction to drivers of water issues: availability, distribution and consumption (uses and users).	Individual Assignment 1: Identify issue of interest. Will be used to form teams.
Week 2	Water pressures and issues	Team Discussion 1: Explore issue and implications for water infrastructure planning.
Module II: Water science		
Week 3	Hydrologic cycle and watersheds – delineation, scales, role as planning framework	Team Discussion 2: Choose a specific watershed, formulate issue problem statement, key aspects and drivers.
Week 4	Physical, chemical and ecological water dynamics, ecosystem services	Individual Assignment 2: Quiz
Week 5	Relationship between freshwater ecosystems and water infrastructure	Individual Assignment 3: Trace your water supply.
Module III: Water management concepts		

Week 6	Three frameworks: Water within the context of Risks and Opportunities Assessment, Ecosystem Services Management, and Integrated Water Resource Management / One Water	Team Assignment 3: Describe team issue in terms of two out of three of the frameworks.
Week 7	Water law, markets and finance as underpinnings for management strategies	Individual Assignment 4: Explore the ASCE Infrastructure Report Card and #Gamechangers.
Module IV: Water management strategies		
Week 8	Water-sensitive planning practice	Team Discussion 4: Define management goal(s) and objectives, and describe capabilities/capitals that are relevant to issue.
Week 9	Explore real world strategies through case studies in strategies	Team Discussion 5: Refine objectives and describe approaches, tools and stakeholders.
Week 10/11	Adaptive management and resilience planning	Final Project, Team Strategy: Develop team strategy using one of three methods: 1. Risk / Opportunities Assessment 2. Ecosystem Services Management 3. IWRM / One Water

Assessment and Grading

You will be evaluated principally on three types of activities:

- Individual assignments. You will submit these electronically for each week due. This is an individual grade.
- Team discussion forum postings. The team facilitator will summarize team discussions and post them to the assignment discussion forum. Please review your team summaries and comment on them before they are posted. This is a team grade.
- Team postings of concluding strategies (final project). The main product of the course will be your problem-driven strategy presented at the end of the course. Make sure your team has a good plan to complete the work on time. The facilitator will post a summary of your team's discussions and decisions. Please review the team materials and comment on them before they are posted. This is a team grade.

Specific evaluation criteria are included with each assignment. There are no exams in this course.

<i>Component</i>	<i>Percent of Grade</i>
Individual assignments	20
Team discussion forums	50
Final project	30

Assessment Criteria

Assessment of both individual and team activity will be based, as appropriate, on

- meeting the objectives of the
- assignments; originality of your work; level
- of critical thinking; and demonstration of
- leadership skills.

To earn credit, you must complete all parts of each assignment, including all required reading and exercises, on time.

If unforeseen circumstances prevent you from completing an assignment on time, please contact your instructor before the assignment is due to obtain permission for a late submission. Without such permission, your assignment will not be accepted.

Grading

You will receive a numeric grade for this course. The numeric grading system used by the University of Washington relies on a decimal scale between 1.7 (low) and 4.0 (high).

For graduate courses, grades below 1.7 are recorded as 0.0 and no credit is earned. A minimum of 2.7 is required in each course that is counted toward a graduate degree. A 3.0 cumulative average in graduate work is required to receive a graduate degree.

Assignments that are partially completed will not be graded.

Here are descriptions of the criteria for your performance in this class. If you meet these criteria for all your work, you will be graded appropriately. Instructors may "interpolate" grades between these standards as they see fit.

4.0	Excellent and exceptional work for a graduate student. Work at this level is consistently creative (where appropriate), thorough, well-reasoned, insightful, well written and shows clear recognition and incisive understanding of the important materials and issues. All assignments submitted are of good professional quality. The value of individual contributions to this course is considerable and positively affects the learning of all participants.
3.7	Strong work for a graduate student. Work at this level sometimes shows signs of creativity, is thorough and well reasoned, and demonstrates clear recognition and good understanding of the important materials and issues. Assignments submitted lack professional quality but demonstrate effort and concern for quality. The value of individual contributions to the course is strong and occasionally significant.
3.3	Competent and sound work for a graduate student. Work is well reasoned and thorough but not especially creative or insightful. The student shows adequate understanding of the important materials and issues although that understanding may be somewhat incomplete. Work submitted is competent but not remarkable. The value of individual contributions to the course is such that they do not influence the quality of the

course one way or the other. This grade indicates neither exceptional strengths nor exceptional weaknesses, but is the grade for "average" graduate performance.

3.0	Adequate work for a graduate student. Work is moderately thorough and well reasoned, but with some indications that some of the important materials and issues is less than complete and perhaps inadequate for graduate study. The value of individual contributions to the course is minimal. However, the work is above the minimal expectations for the course.
2.7	Borderline work for a graduate student. Work barely meets the minimal expectations for the course and may occasionally fall below them. Understanding of the important materials and issues is incomplete or has not been demonstrated. There is little positive value in the individual contributions to the course and there may even be negative effects on the overall learning. Consistent overall performance at this level would be below that of adequate graduate student performance.

Study Tips

To be successful in this course, you'll need to manage your time. Don't try to do everything immediately before the assignment is due. Pace yourself and set aside time each week exclusively for this course. The earlier you set up your course schedule, the easier it'll be to stick to your plan.

There's a lot to read, so do not fall behind in the readings. Communicate with your teammates frequently and regularly. If you are having problems, let me know as soon as possible.

Religious Accommodations

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at

[Religious Accommodations Policy](#)

[\(https://registrar.washington.edu/staffandfaculty/religiousaccommodations-policy/\)](https://registrar.washington.edu/staffandfaculty/religiousaccommodations-policy/).

Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form](#)

About the Instructor

Mary Roderick

Mary Roderick is an affiliate professor with the Department of Urban Design and Planning and a regional planner with the Land of Sky Regional Council in western North Carolina. Her background is in watershed restoration and stormwater management. She has a PhD from the University of Washington, where her research focused on geodesign-based, multi-scalar and multi-functional green infrastructure planning. While at the UW, she also contributed to planning and design for the Duwamish River Superfund site cleanup and the Seattle waterfront redevelopment and seawall redesign. Roderick also has a MA in community planning with an environmental specialization from the University of Cincinnati.

She returned to academia to pursue her master's degree and doctorate following careers in literacy education and non-profit management as well as software development and IT architecture consulting in Germany. While broadly interested in social-ecological systems, she is specifically concerned with climate change and its effects on water resources. Water is the perfect litmus test to measure the cumulative impacts of development, consumption/production, cultural values, engineering practices, and policy decisions on ecosystem health at local and regional scales, as well as to assess our responses to these impacts.

Course Developers

Mary Roderick and Bob Freitag co-developed the course. Bob Freitag is a Senior Instructor and Co-Director of the Institute for Hazards Mitigation Planning and Research, which is an interdisciplinary academic institute housed in the Department of Urban Design and Planning within the College of Built Environments at the University of Washington (<http://mitigate.be.uw.edu>). Bob is also a Certified Floodplain Manager. He has published many articles and written courses for FEMA and others concerning hazards mitigation and floodplain management, and was lead author of "Floodplain Management: a new approach for a new era" (Island Press 2009).

Before coming to the University, he had a 25-year career with the Federal Emergency Management Agency (FEMA) serving as Federal Coordinating Officer (FCO); Public Assistance, Mitigation and Education Officer. Prior to FEMA he was employed by several private architectural and engineering consultant firms in Hawaii and Australia, and taught science as a Peace Corps Volunteer.