

SUMA PS5146 Water Systems Analysis, Spring 2017

Thursday 6:10-8PM

Primary Professor: Dr. Laureline Josset

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Office Hours: by appointment during 4-7 pm Mondays and Tuesdays, 842 Mudd Building

TA: TBD

TA office hours: TBD

Course Description:

This class provides a structured introduction to the integrated analysis of physical and institutional systems for water development and management. The course covers a variety of water analysis techniques divided into three major units: an introduction to water system analysis, modeling and optimization (week 1 to 3), an overview of the natural system (week 4 to 7), and an introduction to the infrastructures and socio-economics of water systems. Theoretical elements will be illustrated with real examples, ranging from city water supplies optimization to regional watershed management to national planning, and in various geographical and meteorological contexts. The students will experiment with existing models developed in the R language to familiarize themselves with concepts of model responses and sensitivity analysis.

Research project

Troughout the semester, the students (individually or in pairs) will conduct a water system analysis of their own design inspired from real cases. The class lectures are organized so that the students are equipped with the theoretical elements necessary to advance their project as the semester goes on. The analysis should include some elements of modeling and computing, however, note that no background in coding is required. The conducted research will result in a report in the form of a brief scientific paper with a literature review, methodology, analysis, and conclusion.

Evaluation

The final report on the research project constitutes the core of the final grade (30%). To ensure that the projects evolve in the correct direction, students will hand in part of their report as assignments over the course of the semester (counting for 20% of the final grade). It is expected that students will develop their technical writing skills as weeks pass. The students will also be required to present their research to the rest of the class (10% of the grade) in the final weeks of the semester.

Moreover, two assignments of computational nature will be due at the beginning and the end of the semester to expose students to other test cases. Assignments must be posted to courseworks before the start of class on the day they are due. Last, the semester will conclude with an in-class final on the last day that will cover all the analytical techniques learned as part of the course.

	% of grade
Research project	60
Problem statement	5
Model description	5
Results and discussion	10
Presentation	10
Final report	30
Short assignments	20
Final Exam	20

DRAFT SCHEDULE (subject to change depending on class pace)

Date	Week	Subject	Deadline
Jan 19	1	Introduction to water systems analysis	
Jan 26	2	Water systems modeling	
Feb 2	3	Water systems optimization	Assignment 1
Feb 9	4	Hydrology: precipitation, run-off	
Feb 16	5	Hydrology: surface water systems	Problem statement
Feb 23	6	Groundwater	
Mar 2	7	Groundwater	Model description
Mar 9	8	Water infrastructure	
Mar 23	9	Water infrastructure	Results and discussion
Mar 30	10	Water demands	
Apr 6	11	Policy and environment	Assignment 2
Apr 13	12	Project presentations	
Apr 20	13	Review	
Apr 27	14	Exam	
May 11		-	Final report

School Policies and Expectations:

Academic Integrity

The School of Continuing Education does not tolerate cheating and/or plagiarism in any form. Those students who violate the Code of Academic and Professional Conduct will be subject to the Dean's Disciplinary Procedures. The Code of Academic and Professional Conduct can be viewed online:

<http://sps.columbia.edu/student-life-and-alumni-relations/academic-integrity-and-community-standards>

Please familiarize yourself with the proper methods of citation and attribution. The School provides some useful resources online; we strongly encourage you to familiarize yourself with these various styles before conducting your research.

Violations of the Code of Academic and Professional Conduct will be reported to the Associate Dean for Student Affairs.

Accessibility Statement

Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website:

<http://health.columbia.edu/disability-services>

Attendance, Late Papers, Missed Tests, Class Behaviors and Civility

Students are expected to arrive on time, attend all classes, and to stay until the end of class unless they have notified the instructor at the beginning of the session that they will be leaving early. Students are responsible for all reading and homework assignments, and must post assignments on time. Assignments will be marked down a full letter grade for each day late.

Required Readings

All required readings will be posted on Canvas, no textbook are required.