ESM 224 Syllabus

Course Objective

The objective of the course is to provide students with a better understanding of the science and management issues related to managing a watershed in a sustainable manner. The course will cover indicators of water resources, elements of a watershed management plan, tools to understand the various components of the watershed and perform analysis of sustainability, and possible solutions to supply and water quality problems within the watershed. Water Quality in streams, rivers and lakes depends to a large extent on land-use and the corresponding watershed processes. The course requires significant student participation in class discussions and final presentations, and a weekly 2-hour session in the Student Computing Facility. Prerequisites: ESM 202, 203. Strongly recommended: ESM 222, 234 or 235, ESM 263. Recommended: ESM 223, ESM 225.

Reading materials:

Provided online in the GauchoSpace course website

Assignment:

Develop a Watershed Management Plan for the watershed of your choice, working in teams of 2 or 3. Each week beginning with Week 3 you will provide a deliverable, as indicated in the GauchoSpace course website. There is also a final oral presentation of your plan during finals week at the time scheduled for our “final”. You will receive feedback weekly on your deliverables, and your final grade will be based 80% on your compiled written Watershed Management Plan and 20% on your oral presentation.

Lectures:

Note that each case study is covered in one lecture, except cases 5 and 6 which are combined into one lecture.

Lecture 1 - Introduction to Water Sustainability
Lecture 2 - Water Policy related to Watershed Management
Lecture 3 - Elements of a Watershed Management Plan
Lecture 4 - Water Supply and Demand
Lecture 5 – Improving Water Management
Lecture 6 – Quantifying the Energy-Water Nexus
Case 1 – San Diego Water Supply
Case 2 - Santa Ana Watershed
Lecture 7 - Agricultural Loads & BMPs
Lecture 8 - Urban Loads & BMPs
Lecture 7 & 8 - Urban BMP Design
Case 3 – Napa Nutrient Management
Lecture 9 - Cost Optimization
Case 4 - Santa Clara Watershed Nutrient Management
Lecture 10 - Selecting a watershed model
Case 5 - San Cristobal Chiapas Watershed Management Plan
Case 6 - Tijuana Watershed Management Plan
Lecture 11 - WQ protection = Real Costs
Case 7 - Lower St Johns River FL - Nutrient Management Plan
Lecture 12 - Sources of Uncertainty
Lecture 13 - WQ Markets
Lecture 14 – Summary

Final Presentations: Tuesday December 12, 2023 – note that you must plan on being there for all the presentations, from 12 to 3 pm.