Course Syllabus—Fall Quarter, 2017

Introduction
October 2    Water Quality Concerns, an Introduction to Course
October 4    Environmental Standards for Water Quality Protection

Sources of Contaminants in Water Supplies
October 9    Sources of Contaminants in Water
October 11   Sources of Contaminants in Wastewater Effluent

Concentration of Chemicals in Treated Water Supplies
October 16   Trace Metals and Other Inorganics
October 18   Organic Chemicals

Microbiological Contaminants in Water Supplies
October 23   Major Waterborne Microbial Contaminants
October 25   Coliform Bacteria and Viruses
October 30   MID-TERM

Risk Assessment
November 1   Assessment of Risk from Contaminant Exposure
November 6   Water Quality Case Studies for Risk Assessment

Stream Water Quality – the Need for Treatment Options
November 8   Aspects of Stream Pollution
November 13  Oxygen sag curves and Streeter-Phelps models
November 15  Evaluation of TOC, BOD, COD

Water Treatment Processes
November 20  Chemical Coagulation Techniques
November 22  Activated Carbon Treatment, Ion Exchange, Desalinization, and Reverse Osmosis Processes
November 27  Disinfection Options and Concerns

Waste Water Treatment Options
November 29  Primary and Secondary Treatment of Sewage
December 4   Advanced Wastewater Treatment Schemes
December 6   Overall Course Summary for Water Quality Issues
Reading List

The reading list evolves during the course according to classroom discussion, questions posed by students, etc.

The standard reading list is as follows:


Learning Objectives

The goals of the course are to provide an understanding of water quality and health principles to public health students and those from other engineering programs on campus.

Field trips to various water agencies and treatment plants will be considered. The trips will help to visualize applications of chemical principles to water bodies and technology operations. The course is designed for graduate students and serious upper-class undergraduates. Students enrolled in Public Health, Environmental Health, engineering fields, or chemistry are considered appropriate enrollees to the course.

Core Competencies
The goals for learning objectives and core competencies for the course EHS 401 are similar to those listed for MS/MPH candidates in environmental health sciences. The course strives to incorporate chemistry and biological principles in the understanding of environmental measurements. Students completing the ten-week course should be able to:

- gain an understanding of the formation of water bodies and their chemical and biological constituents, any sources and sinks of chemicals and microbes in water bodies;
- gain understanding of water reuse and recharge strategies, supplementation of water bodies;
- gain an understanding of desalinization techniques for production and supplementation of water resources;
- gain an understanding of health implications through criteria document reviews;
- gain an understanding of treatment technologies for raw water supplies and those of wastewater treatment systems;
- gain skill and knowledge in the development and design of research projects and the ability to follow the designs to completion through discussion.

Core competencies in the above knowledge objectives will be developed through lecture format of topics given above. In addition field trips to local agencies to understand issues faced by such agencies as Water Resources Control Board or the Dept. of Water Resources. The calculation of reference dose (RfD) and acceptable daily intake (ADI) estimates for toxicological studies of exposure to animals and humans will be explored.