

Water Quality for Professionals CSES 5314

I- Catalogue Description

Global water resource sustainability and management. Current water quality policies. Physical, chemical, biological, and anthropogenic factors affecting water quality, fate and transport of contaminants in water. Approaches of water quality risk assessment. Water treatment and management technologies. Pre: Graduate Standing (3H, 3C)

Course number: 5314

ADP TITLE: Water Quality for Professional

II- Learning Objectives

Upon successful completion of this course, students will be able to:

- Delineate the physical, chemical, and biological aspects of water quality.
- Justify the impact of natural processes and anthropogenic activities on water quality.
- Assess the environmental fate and transport of contaminants in water systems.
- Demonstrate and value the importance of water quality to global ecosystem sustainability.
- Apply different steps of the monitoring cycle in a water system
- Use common statistical techniques for water quality data evaluation
- Employ common water quality standards as risk assessment and decision making tools.
- Design sound and sustainable approaches of risk assessment and water management.
- Communicate water quality policies to general public and decision makers.
- Evaluate and synthesize literature on water quality and its relationships with food, energy, and environmental health and sustainability.

III- Prerequisites and Corequisites

Pre: Graduate Standing

IV- Texts and Special Teaching Aides

Required Readings

Selected journal or news article readings and selected contents from the following two books and documents, all of which will be available at the course Web site:

Boyd, C. E. (2015) *Water Quality: An Introduction*. 2nd Ed. Kluwer Academic Publishers.

Li, Y., and Migliaccio, K. (2010) *Water Quality Concepts, Sampling, and Analyses*. CRC Press. 340 pages.

US EPA Monitoring and Assessing Water Quality.

(http://water.epa.gov/type/watersheds/monitoring/monitoring_index.cfm)

Recommended Readings:

Fishman, C. (2012). *The Big Thirst: The Secret Life and Turbulent Future of Water*. Free Press. 402 pages.

Sedlak, D. (2015). *Water 4.0: The Past, Present, and Future of the World's Most Vital Resource*. Yale University Press. 352 pages.

Chin, D. A. (2013). *Water-Quality Engineering in Natural Systems: Fate and Transport Processes in the Water Environment*. 2nd Edition. Wiley. 472 pages.

Ahuja, S. (2013). *Monitoring Water Quality: Pollution Assessment, Analysis, and Remediation*. Elsevier. 400 pages.

Gray, N. F. (2008). *Drinking Water Quality: Problems and Solutions*. 2nd Edition. Cambridge University Press. 520 pages.

V. Syllabus

Tentative Lecture Topics:	Percent of Course (%)
Introduction to water quality and its impact on global natural resource sustainability and management	10
Water quality policy – Clean Water Act	15
Physical and chemical indicators	15
Biological indicators	15
Impact of natural environmental processes and anthropogenic activities on water quality	15
Water quality standards, risk assessment, management approaches, and communication	15
Water treatment and management technologies	15
Lecture Total:	100