*1. Course number and name*

**ENGR 434: Principles of Environmental Engineering**

*2. Credits, contact hours, and categorization of credits in Table 5-1 (math and basic science, engineering topic, and/or other).*   
3 credits; two 75-minute lectures or three 50-minute lectures per week; engineering topic

*3. Instructor’s or course coordinator’s name*

Elahe Enssani

*4. Textbook, title, author, and year*

Viessman, Jr., Warren, and Mark J. Hammer. Water Supply and Pollution Control, 8th edition, Addison Wesley, 2008.

*a. other supplemental materials*

Supplemental online content (PowerPoint slides of class notes, animations, videos, web-based tools, etc.) delivered via course webpage.

*5. Specific course information*

*a. brief description of the content of the course (catalog description)*

Application of the principles of fluid mechanics and chemistry to protection of water, land through design of water infrastructure from dams/reservoirs to transmission and distribution pipelines to the network of pipelines to groundwater hydrology and well design to water and wastewater treatment design principles to air pollution control and climate change.

*b. prerequisites or co-requisites*

Chem 115 or Chem 180, Engr. 304 (Fluid Mechanics)-May be taken concurrently.

*c. indicates whether a required, elective, or selected elective (as per Table 5-1) course in the program*

Required for Civil Engineering program.

*6. Specific goals for the course*

*a. specific outcomes of instruction (e.g. The student will be able to explain the significance of current research about a particular topic.)*

* The student will demonstrate an ability to design simple reservoirs and water distribution.
* The student will demonstrate the ability to analyze simple distribution piping networks.
* The student will demonstrate basic understanding and knowledge of chemical and physical chemistry laws as they relate to water quality and water treatment systems.
* The student will demonstrate basic understanding and knowledge of water quality parameters.
* The student will demonstrate basic understanding and knowledge of conservation of mass and its application to engineering systems.
* The student will demonstrate the ability to understand groundwater definition, hydrology, movement and estimate the amount of water available as a water resource for a community. air quality parameters and apply the chemical laws to design of the air pollution control systems.
* The student will demonstrate the ability to understand air quality parameters and apply the chemical laws to design air pollution control systems.
* The student will develop an understanding of the issues in climate change.

*b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

ABET student outcomes: 1, 2,3, 4, 7

*7. Brief list of topics to be covered*

* Hydrologic Cycle.
* Municipal Water consumption and water resources.
* Ground water hydrology.
* Water law doctrines.
* Reservoir design, Transmission Facilities, distribution systems.
* Water quality parameters.
* Water chemistry.
* Drinking water standards.
* Disinfection.
* Water treatment processes.
* Wastewater collection, sewer systems.
* Wastewater treatment processes.
* Solid waste/hazardous waste management.
* Air quality criteria/management.
* Contemporary issues: global climate change/sustainability/energy.