

1. *Course number and name*  
**ENGR 434 Principles of Environmental Engineering**
  
2. *Credits and contact hours*  
3 units. Two 75-minutes or three 50-minutes lecture per week.
  
3. *Instructor's or course coordinator's name*  
Instructors: Elahe Enssani, Ph.D., P.E.  
  
Course coordinator: Elahe Enssani, Ph.D., P.E., and Associate Professor of Civil Engineering
  
4. *Text book, title, author, and year*  
Viessman, Jr., Warren and Mark J. Hammer . Water Supply and Pollution Control, 8<sup>th</sup> edition, Addison Wesley, 2008.  
  
*a. other supplemental materials*  
Class Reader (and all course material including HW) on SFSU ILearn.  
  
Vesiland, P.A., Introduction to Environmental Engineering, 2<sup>nd</sup> edition, PWS Publishing, 1997.  
  
Masters, Gilbert M., Introduction to Environmental Engineering and Science, 3<sup>rd</sup> edition, Prentice Hall, Inc., 2007.  
  
Nazaroff, William W and Lisa Alvarez-Cohen, 1<sup>st</sup> edition, Wiley and Sons, 2001
  
5. *Specific course information*
  - a. brief description of the content of the course (catalog description)*  
Principles and fundamentals of environmental engineering. Topics include water resources, ground hydrology, water quality, water chemistry, water and wastewater treatment, air quality, and solid waste management.
  
  - b. prerequisites or co-requisites*  
ENGR 304 (Fluid Mechanics, may be taken concurrently)  
  
CHEM 115 or 180 (Chemistry)
  
  - c. indicate whether a required, elective, or selected elective course in the program*  
Required for Civil Engineering.

6. *Specific goals for the course*

a. *Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

- Develop student understanding of the basic concepts in water resources.
- Develop student understanding of the fundamental principles of water chemistry as needed in environmental engineering.
- Develop student understanding of the fundamentals of water quality parameters and criteria.
- Develop student understanding of the fundamentals of water treatment processes.
- Acquaint student with fundamentals of wastewater collection systems design.

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

Course addresses ABET Student Outcome(s): a, b, c, e, i.

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 and Environment