ENVS 520: Advanced Environmental Chemistry

SYLLABUS

Instructor: Dr. Bassam S. Al-Tawabini
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Prerequisites: CHEM 102 or Equivalent

Text: Environmental Chemistry, 8th Edition, By Stanley Manahan, CRC Press, 2005. There will be extensive use of in-class handouts.

Description: Study of the sources, reactions, transport, effects, and fates of chemical species in water, soil, and air environment; nature and source of hazardous wastes, their environmental chemistry, and their treatment, minimization, and the effect of pollutants and hazardous substances on living organisms.

Main Objective: Develop the concept of environmental chemistry and provide updated material in the rapidly developing area of environmental pollution.

Additional Reference Books:

1. Andrews, J. E. "An Introduction to Environmental Chemistry", Blackwell, 2004.
2. Manahan, S. "Fundamentals of Environmental Chemistry", Lewis Publisher, 2001.
3. Baird, C. & M. Cann "Environmental Chemistry, 3rd ed.", Freeman Publisher, 2005.
4. Alloway, B.J. & C.D. Ayres "Chemical Principles of Environmental Pollution, 2nd ed." Blackie Academic & professional, 1997.
5. Spiro, T. G. & W. Stigliani "Chemistry of the Environment, 2nd Ed." Prentice Hall Publisher, 2003.
6. Wolfgang, K. "Environmental Analysis" Elsevier Publisher, 2001.

Course Grades:

Attendance & Class Participation	10%
Exam No. 1	20%
Term Project	20%
Exam No. 2	20%
Final Exam	30%

- Each student (s) will select (or will be assigned) a topic in environmental chemical pollution (air, water, marine and sediment) to work on during the semester, keeping in mind that:

  - Research topic should cover current issues in environmental science.
  - A summery report on the progress achieved should be submitted every 4 weeks.
  - A PowerPoint presentation on the project should be given by the student upon submission of his report.
  - The final report/paper should be submitted on time and no report/paper will be accepted after the deadline.

- There will be a couple of laboratory sessions (at KFUPM, RI) during the semester.
- Copies of the power point presentations will be included in the WebCT of the Course.
- Classes will require prior reading of book chapters and/or journal articles given in class.
- Class participation will include reading assignment of material to be discussed in class as well as writing a small report on an issue discussed in the class.
- There will be Two (2) Major and one Final EXAM

COURSE OUTLINE

Week No.	Description	Textbook -Chapters
1	Class begins and Overview	
2	Review of General Chemistry	Paper & Handout
3	Introduction to Environmental Chemistry	CH. 1
4	Fundamentals of Aquatic Chemistry	CH. 3
5	Water Pollution	CH. 7
6	Analysis of Water Pollutants	Paper & Handout
7	Laboratory Session	Lab
8	Water Treatment	CH. 8
9	The Atmosphere and Atmospheric Chemistry	CH. 9
10	Inorganic Air Pollutants + Organic Air Pollutants	CH. 11, 12
11	Analysis of Air Pollutants	Paper & Handout
12	Endangered Global Atmosphere	CH. 14
13	Geosphere & Geochemistry	CH. 15
14	Soil & Agriculture Environmental Chemistry	CH. 16
15	Presentations of the Term Projects	