

Chem 610 / Environmental Chemistry Science / NJIT 2012 Fall semester / Bozzelli

Two Texts: (i) **Environmental Chemistry A Global Perspective** – Gary van Loon and Stephen Duffy, Oxford Press – 2nd or 3rd edition (Paper Back ok). (ii), A good **general chemistry text** – within last 10 -15 years - used ~ \$10.

Course starts with overview of earth and review of Chemistry fundamentals - –The Earth and Lithosphere, Environmental Chemistry of the Atmosphere, Global Warming, Aqueous and Hydrosphere Env't Chemistry.

Subject to change with notification

| Lecture Week | Topic | Text reference |
|-----------------|--|---|
| 1 Sept 10 | Review Fundamental Concepts Earth: Litho- and Atheno- Spheres, Earth: Crust, Lithosphere and Core – Review | Ch. 1, + Review, Ch 17 also Ch 1 – Girard Start Ch's - 2, 3 |
| 2 Sept 17 | Continue Review / Energy / Atmospheric Chemistry | Chapters 2, 3 |
| 3 Sept 24 | Continue Review / Energy / Troposphere, and Stratospheric Chemistry | Chapters 3, 4 |
| 4 Oct 1 | Stratosphere and Troposphere Chemistry Precipitation | Chapters 4, 5* |
| 5 Oct 8 | Aerosols / Urban and Indoor Atmosphere | 6*, 7* |
| 6 Oct 15 | Global Climate Warming | Chapter 8 |
| 7 Oct 22 | Environmental Chemistry - Chemical Cycles; Hydrosphere; Aquatic Chemistry - Species in Aquatic Systems | Ch 9 / Chapter 10 section 1 + |
| 8 Oct 29 | Exam – I | |
| 9 Nov 5 | Aquatic Chemistry / Gases in Water | Chapter 11 Project – 1 due |
| 10 Nov 12 | Prob's in Ch 9, 10, 11 Organic Matter and Metals in Env't Waters | Chapters 12, 13 |
| 11 - Nov 19 | Colloids – Surfaces Microbiological Processes | Chapters 14, 15, |
| 12 Nov 26 | Microbiological process and Water pollution / treatment | Chapters 15, 16 |
| 13 Dec 3 | Earth: Crust, Lithosphere and Core – Review 17 Soil Properties | Chapters 17, 18, 19 Project -2 due |
| 14 Dec 10 | Organic Biocides / Review | Chapter 20 |
| 15 Dec 17 | Final Exam | |

Reference books - suggested / not required: (i). (ii) **Principles of Environmental Chemistry** by James E. Girard. Jones and Bartlett Publishers (good for concepts). [NJIT Library resources](#) (Check **Distance Learning** section on Library page for info on NJIT library resources)

Grading: **Two Exams** (~ 300 pts each), Exams are scaled - - **Two projects** (100 pts each)/ Example projects (i) 2-3 page paper summarizing a **journal** research article in area of your interest, (ii) 2-3 page paper describing Env't process (example Geology - mechanism on how Earthquakes Occur, or Fracking for Natural Gas), (iii) or presentation to class on: (a) material in text or (b.) your research

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Review material

- Concentration units ; Unit conversion Concentration
- Rates and rate equations
- Pressure and $PV=nRT$
- Equilibrium
- Reaction Energies
- Reaction Kinetics (reaction rates)
- Common organic molecules, structures and formulas.
- Calculation of pH strong and weak acids