

Syllabus for EK 335: Introduction to Environmental Engineering Science

4 hours/week

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| 1. Mass and Energy Transfer | 1 week |
| 2. Environmental Chemistry | 1.5 weeks |
| Inorganic Chemistry | |
| Organic Chemistry | |
| Nuclear Chemistry | |
| 3. Growth Models | 1 week |
| Resource Consumption | |
| Population Growth | |
| Economic Growth | |
| 4. Risk Assessment | 1.5 weeks |
| Hazard Identification | |
| Dose-Response Assessment | |
| Exposure Assessment | |
| Risk Characterization | |
| Comparative Risk Analysis | |
| 5. Water Pollution | 2.5 weeks |
| Water resources and pollutants | |
| Oxygen demand | |
| Pollutant transport | |
| Water and waste water treatment | |
| Legislations | |
| 6. Air Pollution | 2.5 weeks |
| Emissions overview (industry, transportation, commercial and residential) | |
| Legislations | |
| Criteria and Toxic Air Pollutants | |
| Pollution modelling | |
| Pollution Control | |
| Air pollution and Meteorology | |
| 7. Global Change | 1 week |
| Greenhouse effect and global temperature | |
| Carbon, nitrogen, and oxygen cycle | |
| IPCC Emissions Scenarios | |
| Oceanic changes and changes in the stratosphere | |
| 8. Solid Waste Management and Resource Recovery | 2 weeks |
| Life-Cycle Assessment | |
| Source Reduction including a discussion of the RoHS Directive | |
| Collection and Transfer Operations | |
| Recycling | |
| Waste to Energy Conversion | |
| Landfills | |

Text: Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineering and Science, 3rd edition (2008), Prentice Hall, Upper Saddle River, NJ.