

CIVE438 POLLUTION CONTROL ENGINEERING
 Fall Semester 2008
 M-T-W-R 9:00 AM
 C 142 Clark
 Instructor: T. G. Sanders
 Office and Telephone: A207E, 491-5448
 Office hours: 1-3 PM MTW

| Lecture Number | Date | Topic | Reading Assignment | Problem Assigned |
|----------------|-------|---|--------------------|----------------------------|
| 1 | 8/25 | Introduction | 1-40 | "Making the Grade" |
| 2 | 8/26 | Environmental Engineering | 41-52 | Life cycle of Schistosome |
| 3 | 8/27 | Hydrology | 97-107 | 2-2 |
| 4 | 8/28 | Runoff Analysis (Quiz I) | 128-133 | 3-3 |
| 5 | 9/2 | Reservoir Storage | 108-110 | 3-33, Probabilistic design |
| 6 | 9/3 | Groundwater | 133-146 | Well derivation |
| 7 | 9/4 | Groundwater Flow (Quiz II) | 153-155 | 3-56,358 |
| 8 | 9/8 | Water Treatment | Any chemistry text | 4-28 |
| 9 | 9/9 | Chemistry Review | 187-198 | 4-29 |
| 10 | 9/10 | Hardness(skip pgs. 244 & Fig 4-18) | 235-247 | 4-59 |
| 11 | 9/11 | Hardness Removal (Quiz III) | 247-255 | 4-67 |
| 12 | 9/15 | Removal Calculations | | 4-71 |
| 13 | 9/16 | Water Quality | 213-226 | "Russia's Legacy...." |
| 14 | 9/17 | Water Quality Too (Quiz IV) | | |
| 15 | 9/18 | EXAM I | 294-307 | |
| 16 | 9/22 | Disinfection | 354-365 | 5-2, 5-5, 5-13 |
| 17 | 9/23 | Water Quality Management | 365-372 | 5-19 |
| 18 | 9/24 | Determination of BOD Constants | 372-390 | 5-38 |
| 19 | 9/25 | Biochemical Oxygen Demand (Quiz V) | | Min. DO Derivation |
| 20 | 9/29 | DO Sag Curve | 391-400 | 5-48 |
| 21 | 9/30 | Water Quality of Lakes | 449-455, 419-426 | Killer lakes |
| 22 | 10/1 | Wastewater Treatment | 427-437 | 6-1, 6-6 |
| 23 | 10/2 | Characteristics of Wastewater (Quiz VI) | 459-464 | 6-2 |
| 24 | 10/6 | Activated Sludge | 482-489 | 6-18, 6-29 |
| 25 | 10/7 | Trickling Filters | 489-493 | 6-16, 6-41 |
| 26 | 10/8 | Oxidation Ponds | 519-525 | 6-48, 6-49 |
| 27 | 10/9 | Sludge Dewatering (Quiz VII) | 493-497 | Sludge truck volume |
| 28 | 10/13 | Advanced Wastewater Treatment | 547-562 | 7-3, 7-17 |
| 29 | 10/14 | Air Pollution | 572-580 | 7-19 |
| 30 | 10/15 | Origin and Fate of Air Pollutants | 580-588 | 7-22, 7-24 |

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| 31 | 10/16 | Air Pollution Meteorology (Quiz VIII) | 589-597 | 7-30, 7-31 |
| 32 | 10/20 | Atmospheric Dispersion | Handout, 2-4 | Own Ethical Dilemma |
| 33 | 10/21 | Ethics in Engineering | 32-35 | “Whistle Blower...” |
| 34 | 10/22 | Ethics in Engineering | Handouts | ASCE Canons of Ethics |
| 35 | 10/23 | Ethics in Engineering (Quiz IX) | | “Defiant Engineer...” |
| 36 | 10/27 | Ethics Again | | |
| 37 | 10/28 | Code of ASCE | | |
| 38 | 10/29 | EXAM II (Seven Canons of Ethics, 20% of Exam) | 652-659 | |
| 39 | 10/30 | Noise Pollution (Quiz X) | 699-708 | 8-3, 8-25 |
| 40 | 11/3 | Noise Protection in Highway Design | Handout | 8-26 |
| 41 | 11/4 | Sanitary Sewer Design | | Sanitary Sewer |
| 42 | 11/5 | Sewer Design | | |
| 43 | 11/6 | Sewer Design (Quiz XI) | | |
| 44 | 11/10 | Sewer Design | | |
| 45 | 11/11 | Sewer Design | | |
| 46 | 11/12 | Storm Sewer Design | 116-119 | Storm Sewer |
| 47 | 11/13 | Storm Sewer Design (Quiz XII) | 125-128 | |
| 48 | 11/17 | Storm Sewer Design | 736-745 | |
| 49 | 11/18 | Solid Wastes or Trashcan Technology | 745-768 | Trash as an opportunity |
| 50 | 11/19 | Collection of Solid Wastes | 762-784 | 9-7 |
| 51 | 11/20 | Truck Routing(Quiz XIII) | 775-783 | 9-8 |
| | 11/22-30 | Thanksgiving Day Holidays | | |
| 52 | 12/1 | Sanitary Landfill Design | 814-819 | Landfill design |
| 53 | 12/2 | Hazardous Wastes | | Gas volume & derivation |
| 54 | 12/3 | EXAM III | 819-825 | |
| 55 | 12/4 | Risk Assessment(Quiz XIV) | 837-846, 851-856 | Love Canal |
| 56 | 12/8 | CERCLA and SARA | 887-892 | Times Beach |
| 57 | 12/9 | Land Disposal | 925-931 | |
| 58 | 12/10 | Ionizing Radiation | 946-947 | |
| 59 | 12/11 | Review (Final Definitions Quiz) | | |
| | 12/19 | FINAL EXAM (7:00 AM-11:00 AM) | 1-789 | Everything |

Course Text:

Davis, M. L. and Cornwell, D. A., **Introduction to Environmental Engineering**, Fourth Edition, McGraw-Hill Inc.

Course Requirements:

1. Problem sets and individual problems will be assigned on a weekly basis. Single problems will be due next class period and the problem sets will be due one week from day assigned. Only homework submitted on engineering paper (either green or white) will be accepted. Poor grammar and spelling will affect grade.
2. No credit for late homework.
3. Individual work is much preferred over collaborative efforts, even at the expense of correct answers.
4. There will be three one-hour exams, a two-hour final exam and a short definitions quiz once a week (first 10 minutes of Thursday lectures). All midterm exams, quizzes and final exam will be closed books and closed notes. In addition no cell phones and only FE exam approved calculators can be used.
5. Final grade determination:

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| Homework | - 100 points |
| Short quizzes | - 150 points |
| Hour exams | - 300 points |
| Final exam | - 200 points |

Course Objectives:

1. To become conversant with the technical language and terminology used by the Environmental Engineering Profession.
2. To develop an awareness of the environmental problems, issues and controversies currently facing us locally, nationally and internationally.
3. To understand the basic concepts required for problem solving dealing with water supply, wastewater removal, solid wastes, air pollution and noise pollution.
4. To understand the Civil Engineering Canons of Ethics and their importance.
5. To be able to pass the Environmental and Sanitary engineering sections of the Professional Engineering Exam.

Ideal learning algorithm:

Read the text ⌘ try the problem ⌘ Listen to the lecture ⌘ Do the problem

If you hear it, you'll forget it.

If you see it, you'll remember it.

If you do it, you'll know it.

If you teach it, you'll understand it. (Paraphrased from Einstein)

And

“Never make your directions to students so specific as to rob them of the pleasure of discovering things for themselves.” Florence Rene Sabin MD