
OFFICE HOURS:  By arrangement

GRADING SCALE:  A = 92 - 100; B = 82 - 91.9; C = 70 - 81.9; D = 60 - 69.9

COURSE EVALUATION:  This course will be evaluated on-line. You will be sent information directly about this.

OUT-OF-CLASS ASSIGNMENTS

Main Points are due throughout the semester as indicated in the assignment notice
Summaries of Experiments are due on **February 21 & March 25, 2008**
Review Article Exercise is due **April 25, 2008, 5 p.m.**

FINAL EXAMINATION – Friday, May 16, 2008; 8:00-10:00 a.m.
Room 1104 H. J. Patterson Hall

GRADING
Examination 1  25%
Examination 2  25%
Out-of-Class Assignments  20%
Final Examination  30%
TENTATIVE SCHEDULE

January
29 Introduction, Content, Format, Overview

THE RESOURCES: SOIL AND WATER
31 Geology and Soils across the Landscape

February
5 Surface and Ground Water Systems
7 Physical and Chemical Properties of Water
12 A Soil Model
14 Soil Solution’s Master Variables
19 Exchange and Adsorption
21 Soil and Aquatic Biology
26 The Atmosphere and Its Properties

POTENTIAL POLLUTANTS
(Sources, Impacts and Controls)

March
4 Examination 1
7 Sediment
11 Nutrient Cycling
13 Nitrogen
17-21 SPRING BREAK
25 Phosphorus
27 Nitrogen and Phosphorus

April
1 Animal Production
3 Incentives and Farm Planning for Pollution Control
8 Non-point Source Pollution
10 Water and Wastewater Treatment
15 Examination 2
17 Development and Urbanization
22 Industrial Pollutants (Trace Inorganic compounds)
24 Industrial Pollutants (Organic compounds)
29 Industrial Pollutants (Radionuclides)

May
1 Remediation
5 Air Pollution
8 Air Pollution
12 Air Pollution
16 Final Examination

Honor Code
The University of Maryland College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information the Code of Academic Integrity or the Student Honor Council, please visit http://www.studenthonor council.umd.edu/whatis.html."
OUT-OF-CLASS ASSIGNMENTS

There are three distinct out-of-class exercises during the semester:

1.) Main Points
2.) Summary of Experiments
3.) Review Article/Cognitive Skills Exercise

1. **Main Points** (worth 5% each or 10% of your grade)

Main Points consists of e-mailing me a specified number of main points about an assignment. Assignments may be videos or articles that I will make available to you. Main Points are due in my e-mail by **12:30 a.m.** on the due date. Main Points will be discussed in class on the due date.

2. **Summary of Experiments** (worth 5% each or 10% of your grade)

Locate experiments within each of the following areas of soil-water pollution: a) nitrogen or phosphorus and b) non-agricultural pollutants. Use the list attached as a guide for sources. For each experiment attach a hard copy of the article and write a short (1 page word-processed) summary to include the following:

- your name
- title, author, year, source
- brief background (Why was the experiment performed?)
- list of manipulated or controlled variables
- list of response variables
- summarize the response variables
- draw some concise conclusions

Summaries are due on the following dates: **February 21** (nitrogen or phosphorus) and **March 25** (non-agricultural pollutants). ONLY HARD COPIES OF THE ARTICLE AND SUMMARY WILL BE ACCEPTED. Time will be reserved the class period before the summaries are due to discuss confusing concepts or procedures.

**Possible Sources of Experiments**

- Applied Agricultural Engineering
- Applied Agricultural Research
- Chemosphere
- Environmental Management
- Environmental Pollution
- Environmental Toxicology and Chemistry
- Geoderma
- Ground Water
- Ground Water Monitoring Review
- Journal of Environmental Engineering, ASCE
- Transactions of the American Geophysical Union
- Journal of Environmental Quality
- Journal of Soil and Water Conservation
- Journal of Hydrology
- Soil Science Society of America Journal
- Soil Science
- Soil and Tillage Research
- Transactions of the American Geophysical Union
- Water Resources Research
- Water Resources Bulletin
- Weed Science
- Transactions of the American Society of Agricultural Engineers
3. **Review Article/Cognitive Skills Exercise (worth 5% of your grade)**

Locate a review article that interests you using the list attached as a guide for sources. Obtain approval by **February 21** for the article you choose by e-mailing me the name and source of the article. In your write-up on this review article, complete the following and attach a copy of the article:

- title, author, year, and source
- Develop and answer 5 questions based on information in the review. Questions may be any combination of multiple choice, essay or completion. Consult information on cognitive skills (below). Only one of your questions may be a "knowledge" question. The remaining questions may be any combination of the higher cognitive skills. **This activity is due April 25.**

### POSSIBLE SOURCES FOR REVIEW ARTICLES

- Advances in Soil Science
- Advances in Applied Microbiology
- Advances in Soil and Water Conservation
- Advances in Hillslope Processes
- Advances in Agronomy
- Critical Reviews in Plant Science
- Microbiological Reviews
- Residues Reviews
- Issues in Environmental Science and Technology

The purpose of the project is twofold: 1) to familiarize you with the usefulness of review articles and 2) to make you more aware of the various cognitive levels or skills, an idea discussed at length by an educational psychologist, Bloom. Information about cognitive levels arranged from simple to complex follows:

1. **Knowledge** refers to the recall of previously learned material. Students are required to remember facts, principles, and steps in a sequence, and other information in the same way in which the material was presented in class. The key activity is *recall*. Example: Identify the "wage fund doctrine."

2. **Comprehension** refers to the understanding of learned material. Students must show that they grasp the meaning of the material by explaining, interpreting, translating to a new form or symbol system, and extrapolating. The key activity is *explain*. Example: Explain the statement: Aquinas was to Aristotle what Marx was to Ricardo.

3. **Application** refers to the ability to use learned material in new and concrete situations. Students must use abstractions, such as concepts, principles, rules, theories, and laws, to find solutions to new problems. The key activity is *transfer*. Example: Use the wage fund doctrine to explain wage rate in the writing of J. S. Mill.

4. **Analysis** refers to the ability to break down material into its component parts so that the organizational structure is understood. Students are required to determine distinguishing characteristics, show the relationship between parts, and so on. The
key activity is separate. Example: Compare and contrast the attitudes toward male and female sex roles in the work of Ibsen and Huysmans.

5. Synthesis refers to the ability to put parts together to form a new whole that was not previously present. Students must think creatively to produce new products, such as a theme, speech, article, or research proposal. The key activity is combine. Example: Compose an essay discussing how Nietzsche and Marx's approach to the question of truth differed from that of a positivist such as Comte.

6. Evaluation refers to the ability to judge the value of material for a given purpose using definite criteria. Students are required to make value judgments, to rate ideas or objects, and to accept or reject materials based on standards. The key activity is make judgment. Example: Using the five criteria discussed in class, critically evaluate Adam Smith's theory of economic development.

Examples Of Student Activities and Verbs for Bloom's Cognitive Levels.

<table>
<thead>
<tr>
<th>Bloom's Cognitive Level</th>
<th>Student Activity</th>
<th>Words to Use In Item Stems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Remembering facts, terms, concepts, definitions, principles</td>
<td>Define, list, state, identify, label, name, who? when? where? what?</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Explaining/interpreting the meaning of material</td>
<td>Explain, predict, interpret infer, summarize, convert, translate, give example, account for, paraphrase</td>
</tr>
<tr>
<td>Application</td>
<td>Using a concept or principle to solve a problem</td>
<td>Apply, solve, show, make use of, modify, demonstrate, compute</td>
</tr>
<tr>
<td>Analysis</td>
<td>Breaking material down</td>
<td>Differentiate, compare/contrast, distinguish from____, how does____ related_____? Why does_____ work?</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Producing something new or original from component parts</td>
<td>Design, construct, formulate, imagine create, change, write a poem or short story</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Making a judgment based on a pre-established set of criteria</td>
<td>Appraise, evaluate, justify, judge, which would be better?</td>
</tr>
</tbody>
</table>

Source: Adapted from Goodwin and others