

**Syllabus****NRM 370 WATERSHED MANAGEMENT Fall 2005**

**Texts:** Brooks, K.N., P.F. Ffolliott, H.M.Gregersen and J.L. Thames (2003) *Hydrology and the Management of Watersheds*. Third Edition, Iowa State U. Press, Ames, Iowa

Anonymous (1983) *Alaska Watershed Management Handbook*. Alaska Dept. of Community & Regional Affairs/Ak. Dept. of Environmental Conservation, Juneau, 62 pp. (will be on reserve in library).

**CLASS OUTLINE**

**Class Meets Tue & Thur. 9:45-10:45 am. O'Neill 214; Lab Session meets Mon. 2-5pm. O'Neill 359**

Sept.01 Introduction, Hydrologic cycle-water budget . *Brooks:pp.xiii-22*  
 Homework: Water units and solving problems *Handout+Brks551-2*

Sept.05 Labor Day -- No Class

06 Problem Solving -- Units in hydrology

08 The Watershed: Systems Thinking - Open Systems. *Handout*

Sept.12 Field Trip -- Spinach Creek - Stream gauging- Handout + Brooks pp. 88-105

13 Watershed Input - Solar Energy, Energy Exchange *Brooks:pp.47-51*

15 Radiation Balance

Sept.19 Lab: Field Trip -- TBA

20 Energy Budget - Water Budget Interaction *Brooks:pp.47-51*

22 Watershed Input - Precipitation, Atmospheric Moisture. Brks Ch.2

Sept.26 Lab: Watershed Morphology/description/ maps *Handout+Brks Chap.10*

27 Catch Up

29 Snow -- Brooks: Chap. 15

Oct. 03 Lab: Lapse rate/precipitation problems

04 Review

06 **EXAM #1**

Oct. 10 Lab: Snowmelt: Brooks: Chap. 15

11 The Watershed Surface: Interception & Throughfall *Brooks:pp.Chap.2*

13 Infiltration / soil hydrologic properties *Brooks:pp.77-88*  
**\*\*\*Oct. 17 Last Day to apply for Fall Graduation \*\*\***

Oct. 17 Lab: Soil Moisture *Handouts*

18 Evaporation and Transpiration *Brooks:Chap.3*

20 Vegetation and the Hydrologic Cycle *Brooks: Chap.6*

Oct. 24 Lab: Local Water Budget calculations Handout

25 Groundwater and Streamflow *Brooks:Chap.4 pp.88-105; Chap.5*

27 Streamflow Production: some theories

Oct. 31 Lab: Groundwater & Groundwater Quality - DRASTIC Index

Nov. 01 Channel Dynamics -- Brooks: Chap.9

03 Streamflow: the hydrograph

Nov. 07 Lab: Universal Soil Loss Equation *Brooks:pp.Chap.7*

08 Review

10 **EXAM #2**

Nov. 14 Lab: Erosion and sedimentation *Brooks: Chap.7*

15 Erosion - mass wasting/landslides *Brooks:Chap.8*

17 Water Quality - Temperature & Dissolved Oxygen Brooks: Chap.11

Nov. 21 Lab: Fish Habitat Considerations *Handout*

22 Water Quality - Nutrients, Toxic Materials. Brooks: Chap.12

24 **Thanksgiving Holiday**

Nov. 28 Lab: Riparian Buffer design: Brooks: Chap.13

29 Economics of Watershed Management *Brooks:Chap.19*

Dec. 01 AkStateForestPracticesAct *Handouts*

Dec. 05 Lab: Cumulative Impacts *Handouts*

06 Planning and Appraisal/Watershed Analysis *Brooks:Chap.19*

08 Review

Dec. 12 TBA

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### Course Goals

#### NRM 370 INSTRUCTIONAL OBJECTIVES

1. Develop appreciation and understanding of the linkage between the terrestrial and aquatic systems
  - between land and water.
  
2. Develop a working knowledge of hydrology.
  - a. familiarization with terms and units of hydrology
  - b. ability to calculate & understand the local water balance
  - c. knowledge of major mechanisms of soil erosion (by water) and factors influencing non-point source water pollution.
  - d. knowledge of what information is needed to solve watershed management problems and where to find it.
  
3. Develop ability to interpret land-use activities in terms of hydrologic processes – Deduce or predict the nature and relative seriousness of impacts of land-use on hydrologic systems.
  
4. Develop appreciation of multidisciplinary nature of watershed management
  - a. role of science & technology
  - b. role of economics
  - c. role of politics & law
  - d. role of people

OK

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### Grading Policies

#### NRM 370 GRADING POLICY

The grade received in this course will be based upon performance on exams, homework assignments and lab/field sessions.

The following percentages will apply:

Exams (2 exams + final) 60 %

Homework/Project 30 %

Participation 10 %

The instructor reserves the right to modify the final grade in consideration of notable progress demonstrated by an individual, or unforeseen and extenuating circumstances. In such cases, extra credit assignments and/or makeup work may be used at the discretion of the instructor.

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**Ethical Expectations**

All UAF students are expected to adhere to the Student Honor Code and all UAF Faculty are expected to adhere to their professional code of ethics. Both are found below. Continuing with this course implies agreement to adhere to the student honor code.

The on-line environment as well as modern technology make it easy to obtain information from a variety of sources and use it as if it were your own. This will be construed as unethical and will not be tolerated in this course. While much of the "information" out there is "general knowledge", the specific words, graphics, and other images used to express this general knowledge, if not your own, should include the appropriate source acknowledgements. This is particularly important for copyrighted material.

My expectations for you as a student and for myself as an instructor are:

1. to be honest: we will not steal from others; we will not cheat; we will not present the work of others as your own.
2. to be just/fair: we will treat persons in similar situations similarly. This involves technical, constructive criticism of ideas and work of others, and the rendering of advice or help to others.
3. to be truthful: we will not lie; we will keep our promises and be true to our obligations and commitments.
4. to be respectful: we will respect everyone's personhood, their dignity as fellow human beings, and be mindful of the feelings of others in rendering technical criticism and help. Hate-speech will not be tolerated. There will be no name-calling or put-downs or gossip tolerated via any technical capability offered in conjunction with this course.

Obviously, all four of these areas interact, and the general expectation is that you are a good person. Doing the right thing is not always as easy and clearcut as the rules and codes imply. When in doubt as yourself the following 4 questions (from: Archie Patterson, "Ethics in Forestry-Four Self-Help Questions".pp. 45-47 in: Lloyd Irland, ed. (1994) Ethics in Forestry. Timber Press, Portland, OR):

1. What does my conscience say?
2. What if everyone knew?
3. What if everyone did it?
4. What will it look like tomorrow?

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University of Alaska Fairbanks

**Student Honor Code**

As a UAF student, you're subject to the Honor Code. The university assumes that the integrity of each student and of the student body as a whole will be upheld. Honesty is a primary responsibility of you and every other UAF student. It is your responsibility to help maintain the integrity of the student community. UAF's Honor Code is as follows:

1. Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.
2. Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports.
3. No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.

Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violations of the Honor Code may result in suspension or expulsion.

Instructors can either deal with suspected violations of the Honor Code themselves or refer such matters to the University Disciplinary and Honor Code Committee (UDHCC). If the instructor believes that a student should be suspended or expelled from the university for an Honor Code violation, the instructor must request a hearing before the UDHCC. The UDHCC shall decide if the Honor Code has been violated. If it has not been violated, the instructor will evaluate the assignment according to his or her normal procedures. If it has been violated, the instructor will determine how this violation affects the student's grade for the course; the UDHCC will recommend to the dean of student services whether the student should be dismissed from UAF.

#### Student Behavioral Standards

Education at the university is conceived as training for citizenship as well as for personal self-improvement and development. Generally, UAF behavioral regulations are designed to help you work efficiently in courses and live responsibly in the campus environment. They are not designed to ignore your individuality but rather to encourage you to exercise self-discipline and accept your social responsibility. These regulations, in most instances, were developed jointly by staff and students. You should become familiar with campus policies and regulations as published in the student handbook.

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#### UAF FACULTY STATEMENT OF PROFESSIONAL ETHICS

I. Professors, guided by a deep conviction of the worth and dignity of the advancement of knowledge, recognize the special responsibilities placed upon them. Their primary responsibility to their subject is to seek and to state the truth as they see it. To this end professors devote their energies to developing and improving their scholarly competence. They accept the obligation to exercise critical self-discipline and judgment in using, extending, and transmitting knowledge. They practice intellectual honesty. Although professors may follow subsidiary interests, these interests must never seriously hamper or compromise their freedom of inquiry.

II. As teachers, professors encourage the free pursuit of learning in their students. They hold before them the best scholarly and ethical standards of their discipline. Therefore, Professors have high expectations for their students and expect students to meet those expectations to the best of their ability. Professors demonstrate respect for students as individuals and adhere to their proper roles as intellectual guides and counselors. Professors make every reasonable effort to foster honest academic conduct and to ensure that their evaluations of students reflect each student's true merit. They respect the confidential nature of the relationship between professor and student. They avoid any exploitation, harassment, or discriminatory treatment of students. They acknowledge significant academic or scholarly assistance

from them. Professors protect students' academic freedom.

III. As colleagues, professors have obligations that derive from common membership in the community of scholars. Professors do not discriminate against or harass colleagues. They respect and defend the free inquiry of associates. In the exchange of criticism and ideas professors show due respect for the opinions of others. Professors acknowledge academic debt and strive to be objective in their professional judgment of colleagues. Professors accept their share of faculty responsibilities for the governance of their institution.

IV. As members of an academic institution, professors seek above all to be effective teachers and scholars. Although professors observe the stated regulations of the institution, provided the regulations do not contravene academic freedom, they maintain their right to criticize and seek revision. Professors give due regard to their paramount responsibilities within their institution in determining the amount and character of work done outside it. When considering resignation or the interruption of their service, professors recognize the effect of their decision upon the institution and give due notice of their intentions.

V. As members of their community, professors have the rights and obligations of other citizens. Professors measure the urgency of these obligations in the light of their responsibilities to their subject, to their students, to their profession, and to their institution. When they speak or act as private persons they avoid creating the impression of speaking or acting for their college or university. As citizens engaged in a profession that depends upon freedom for its health and integrity, professors have a particular obligation to promote conditions of free inquiry and to further public understanding of academic freedom.

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