

Watershed Management - NRM 460
Western Carolina University

“Anyone who solves the problem of water deserves not one Nobel Prize but two– one for science and the other for peace.”

President John F. Kennedy

Spring 2013

Lectures: Monday and Wednesday 9:05 to 9:55 150 Bardo Fine Arts Center

Labs: Wednesday 1:00 to 3:00 PM 322 Stillwell

Instructor: Brian Kloeppe, 110C Camp Building / 353 Stillwell Building, bkloeppe@wcu.edu, 828-227-3173

Office Hours: Monday 10:00-11:00 AM (110C Camp Building), Wednesday 10:15-11:15 AM (353 Stillwell Building), and by appointment, please email or call

I. Rationale/Purpose

The purpose of this course is to explore water yield, storm flow, drought impact, water quality, and sedimentation along with the process of assessment and management impacts due to socio-economic and policy considerations.

II. Course Aims and Objectives:

- The purpose of this course is to explore, analyze, and understand the interrelationships among land use, soil, water, vegetation, and management.
- *By the end of this course, students will:*
 - Be able to dissect and analyze the hydrologic cycle of a stream and accompanying watershed
 - Determine the impact of vegetative cover on the water throughfall, soil storage, water usage, and yield of a watershed
 - Understand the tools and options available to watershed managers to regulate water yield, sediment export, and risk due to fire, insects, pathogens, and floods.
 - Appreciate the economic value of the long-term security and vitality of decisions that maintain watershed health, stability, vegetative value, stream structure, and water quantity and quality
- Demonstrate an excitement of learning, understanding, and appreciating the function, value, and importance of watersheds.

III. Course Resources

- Required text: Hydrology and the Management of Watersheds. 2003. Third Edition. By Kenneth N. Brooks, Peter F. Ffolliott, Hans M. Gregersen, and Leonard F. DeBano. Blackwell Publishing, Ames, Iowa. ISBN 978-0-8138-2985-2.
- I will post additional resources to the course Blackboard page as the semester goes on. Please learn how to access these resources.

IV. Faculty Expectations of Students/Course Policies

- **Statement on Accommodations for students with disabilities:**

Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Disability Services for more information at (828) 227-2716 or 144 Killian Annex.

- **Statement on Academic Integrity (including plagiarism):**

Academic Honesty Policy

Western Carolina University, as a community of scholarship, is also a community of honor. Faculty, staff, administrators, and students work together to achieve the highest standards of honesty and integrity. Academic dishonesty is a serious offense at Western Carolina University because it threatens

the quality of scholarship and defrauds those who depend on knowledge and integrity. Academic dishonesty includes:

- a. **Cheating**—Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
- b. **Fabrication**—Intentional falsification of information or citation in an academic exercise.
- c. **Plagiarism**—Intentionally or knowingly representing the words or ideas of someone else as one's own in an academic exercise.
- d. **Facilitation of Academic Dishonesty**—Intentionally or knowingly helping or attempting to help someone else to commit an act of academic dishonesty, such as knowingly allowing another to copy information during an examination or other academic exercise.

Instructors have the right to determine the appropriate sanction or sanctions for academic dishonesty within their courses up to and including a final grade of "F" in the course. Within 5 calendar days of the event the instructor will inform his/her department head, and the Associate Dean of the Graduate School when the student is a graduate student, in writing of the academic dishonesty charge and sanction.

Please refer to the student handbook regarding the policies and consequences of academic honesty at Western Carolina University.

- **Statement on late and/or makeup assignments**

Each day that lab summaries are late will result in a reduction of 15% per day. Labs that are more than three days late will automatically receive a zero. Exams can only be made up if I am contacted at least by the day before the exam (before 4 PM) and the student has a legitimate excuse for missing the exam.

- **Statement of expectations for attendance and participation**

I expect students to be in class and actively participating in discussions, labs, and activities. I may call on you to offer an answer, your opinion, or some insight. If you are doing a group or class exercise or lab and someone is not participating in the work, please let me know so that we can make sure that everyone is doing their share to meet our learning goals.

- **Statement of classroom behavior**

Please, no texting during class or lab. We want to create an environment of mutual respect where students can feel able to contribute and learn. We will frequently be surveying the class for opinions, option, calculations, and answers regarding watershed management. It is important that we respect the opinions of all and that we value the diversity of a range of options when discussing watershed management. Anything that distracts us from this goal is not acceptable and will be discussed with the offending student(s).

- **Statement of weather policy**

If the University closes for inclement weather, class will be canceled. If there is another reason to cancel class, then I will notify everyone by email.

V. Grading Procedures:

| Description of Item | Percentage of Grade |
|------------------------------|----------------------------|
| Exam I | 15% |
| Exam II | 15% |
| Labs | 30% |
| Quizzes, Class Participation | 20% |
| Final Exam | 20% |
| Total | 100% |

Letter grades will be assigned according to the following:

| Percentage Grade | Letter |
|-------------------------|---------------|
| 90-100 | A |
| 80-89 | B |
| 70-79 | C |
| 60-69 | D |
| 59 and lower | F |

Plus (+) and minus (-) grades will be assigned to the highest and lowest two points of each grade category (e.g. 99 and 100 = A+, 90 and 91 = A-, 88 and 89 = B+, 80 and 81 = B-, etc.). The grades of A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D- and F indicate gradations in quality from Excellent to Failure. Please note that a C-grade is less than satisfactory and may not meet particular program and/or course requirements.

Composition-Condition Marks. A student whose written work in any course fails to meet acceptable standards will be assigned a composition-condition (CC) mark by the instructor on the final grade report. All undergraduates who receive two CC grades prior to the semester in which they complete 110 hours at Western Carolina University are so notified by the registrar and are required to pass English 300 or English 401 before they will be eligible for graduation. This course must be taken within two semesters of receiving the second CC and must be passed with a grade of C (2.0) or better.

VI. Course Evaluations:

- Online course evaluations for this course will be open from 07 April 2013 to 04 May 2013.

VII. Tentative Course Schedule

The syllabus may change to accommodate meeting schedules, weather due to outdoor labs, and student needs.

Lectures

Chapter Readings refer to course textbook: Brooks, Ffolliott, Gregersen, and DeBano 2003

| Day / Date | Lecture Topic | Reading | Lab on Wednesdays |
|------------------------|------------------------------|----------------|----------------------------------|
| Monday, 14 January | Introduction | | |
| Wednesday, 16 January | Precipitation | Chapter 1 | Lab #1 - precipitation variation |
| Monday, 21 January | MLK Day - no class | | |
| Wednesday, 23 January | Precipitation / Interception | Chapter 2 | Lab #2 - soil moisture |
| Monday, 28 January | Evaporation | Chapter 3 | |
| Wednesday, 30 January | Transpiration | | Lab #3 - evaporation |
| Monday, 04 February | Infiltration / Runoff | Chapter 4 | |
| Wednesday, 06 February | Groundwater | Chapter 5 | Lab #4 - WCU water treatment |
| Monday, 11 February | Veg. & Water Yield / Review | Chapter 6 | |
| Wednesday, 13 February | Exam 1 | | no lab - Kloeppel in Wash. DC |
| Monday, 18 February | Erosion | Chapter 7 | |
| Wednesday, 20 February | Sediment | Chapter 9 | Lab #5 - forest floor |
| | | | Saturday, 23 February field trip |
| | | | Coweeta, Peek's, Highlands |

| Day / Date | Lecture Topic | Reading | Lab on Wednesdays |
|------------------------|-------------------------|----------------|----------------------------------|
| Monday, 25 February | Forest Density | reading | |
| Wednesday, 27 February | Forest Basal Area | online | Lab #6 - forest dens./basal area |
| | | | |
| Monday, 04 March | Snow Hydrology | Chapter 15 | |
| Wednesday, 06 March | Runoff | Chapter 12 | Lab #7 - water balance |
| | | | |
| Monday, 11 March | Turbidity | Chapter 11 | |
| Wednesday, 13 March | Dissolved Oxygen | | Lab #8 - water quality |
| | | | |
| Monday, 18 March | Water Chemistry | | |
| Wednesday, 20 March | Exam 2 | | no lab - 23 February field trip |
| | | | |
| Monday, 25 March | spring break - no class | | |
| Wednesday, 27 March | spring break - no class | | spring break - no lab |
| | | | |
| Monday, 01 April | Riparian Areas | Chapter 13 | |
| Wednesday, 03 April | Wetlands | Chapter 14 | Lab #9 - prepar. water. assess. |
| | | | Saturday 06 April - field day |
| Monday, 08 April | Lakes | reading | |
| Wednesday, 10 April | Streams / Rivers | online | Lab #10 - field data summary |
| | | | |
| Monday, 15 April | Water Usage | reading | |
| Wednesday, 17 April | Water Management | online | no lab |
| | | | |
| Monday, 22 April | Pollution | reading | |
| Wednesday, 24 April | Climate Change | online | no lab |
| | | | |
| Monday, 29 April | Student Choice lecture | | |
| Wednesday, 01 May | Review | | no lab |
| | | | |

Lab reports will be due Wednesday at the beginning of lecture the week after we conduct the lab.

Final Exam: Tuesday, 07 May 2013, 8:30 - 11:00 AM