NREM 4443
(FALL 2019)
WATERSHED HYDROLOGY AND WATER QUALITY
Lecture Monday and Wednesday 8:30 – 9:20am, Room - 361 Agricultural Hall
Labs Monday or Wednesday 1:30-3:20pm, Room – 014 Agricultural Hall

INSTRUCTOR
Dr. Chris Zou
562 Agricultural Hall
Ph: 405-744-9637
Email: chris.zou@okstate.edu
Office Hours: Open door or by appointment

NATURE AND SCOPE

Fresh water is one of the most important renewable natural resources. Water from forest, range and associated wildlands provides a host of services ranging from irrigation and domestic water supply, to fisheries, recreation and aesthetics. In the western United States, 80-90 % of all water comes from watersheds that fall directly under the management of forest, range or other natural resources management specialists. Increasing future demands for high quality water and pressures from conflicting land uses necessitates that forest, rangeland, and wildland managers and environmentalists understand the basic principles of watershed hydrology and sedimentation processes and the ways in which man affects water resources through his activities.

The first half of this course covers basic principles of watershed hydrology - the hydrologic cycle and hydrologic processes. The watershed is the basic unit of study. Emphasis is placed on how climate, vegetation, soils, and land use affect individual component the water budget — evapotranspiration, soil moisture dynamics, streamflow and groundwater recharge. We will also analyze hydrograph and discuss to estimate runoff based on the NRCS curve number method.

In the second half of this course, emphasis is placed on soil erosion and its impact on water quality. We will discuss soil erosion driven by both wind and water, and sedimentation and sediment transport in channel. Water quality issues in Oklahoma.

In the third section, we will discuss management related issues for wildland watersheds, riparian communities and wetland. Emerging tools, technologies and modeling in watershed sciences and management will be integrated into the laboratory sessions.

COURSE OBJECTIVES

This course is primarily intended to be a “first” course in watershed hydrology and water quality. The course includes lecture and lab sessions to achieve the following objectives:
− Gain an understanding of how various hydrologic characteristics of a watershed, such as climate, soils, vegetation and topography manifest themselves in the natural and “managed” hydrologic cycle.
− Learn how the hydrologic processes that operate on watersheds are measured, estimated or described and where to find such information.
− Perform basic calculations in hydrology and apply some techniques in hydrologic analysis.
− Understand how land use affects the quantity and quality of water.
− Understand the "language" of hydrology in order to effectively communicate with water resources and environmental professionals.
− Understand the role of water as a forest and wildland resource and how it relates to other natural resources and activities.

GRADING

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<tbody>
<tr>
<td>Class Quiz</td>
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<td>Lab</td>
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<td>Section 1 Exam</td>
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<td>Section 2 &amp; 3 Exam (also Final Exam)</td>
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<td><strong>Total</strong></td>
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- Assignment of final grades is not based on any preconceived thresholds for letter grades, but roughly follows: ≥90% = A; 80-89% = B; 70-79% = C; 60-69% = D; <60% = F.
- Test scores will be normalized and curved if necessary.
- Grievances over test grading should be aired within one week of the date the test was returned, or the grade will be considered final.
- Make-up tests will be given only because of extreme circumstances. Check with the instructor before the test is given.
- Cheating will result in a grade of ZERO for the test. Your advisor will also be notified. See Class Schedules for tentative dates of test.

ATTENDANCE AND LATE WORK POLICY

Class attendance is a critical component of learning; Attendance is required for both lecture and lab. If you will be absent from class for sponsored activities, or personal emergencies or sickness, you must provide prior notification of the planned absence to the instructor. Late work will only be considered in rare cases where the Instructor has been contacted ahead of time and granted permission for late submission.

LABS AND ASSIGNMENTS

- Lab is a very important component of this course. There will be approximately 11 lab sessions for this class. The standard time for each session is 110 minutes. The lab in the field or field trip may take longer time.
• Each lab includes a brief lecture/explanation on a particular hydrologic and geospatial method followed by practices/assignment. Some labs involve going to the field to perform measurements, thereby giving students some “hands-on” experience.
• An assignment will be handed out during each lab. The due date will vary, based on length and subject matter. An assignment is considered to be late if it is handed in any time after the due date! Assignments submitted late will lose 10% of the grade (equivalent to one letter grade) the first day it is late and an additional 10% for each week thereafter. Any problems with grading must be brought to lab instructor attention within one week of the date of return, or the grade will be considered final.
• All assignment should be done in a professional manner as instructed by lab instructor.

GRADUATE CREDIT

• Graduate students should enroll in NREM 5443. It is required that graduate students perform a scholarly activity beyond what is required in the course for undergraduates.
• Graduate students must complete an independent study project for final report. A guideline for final report will be available for graduate student at due time in D2L.

DROP POLICY

We will adhere to the standard University policy and schedule for dropping or withdrawing from class as printed in the University catalogue, the official OSU Syllabus, and posted on the OSU SIS website (http://academicaffairs.okstate.edu).

ACADEMIC INTEGRITY

OSU is committed to maintaining the highest standards of integrity and ethical conduct. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and altering academic records) will result in an official academic sanction. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended from the University. You have the right to appeal the charge. Please refer the following site for more information:

TEXTBOOK

(Optional)