

MODELS OF FOREST WATER RESOURCES
FNR 4345 (1 credit)
Spring 2012

GENERAL COURSE OVERVIEW

This course is intended to provide students insight into the construction and evaluation of hydrologic models, the principal tool used for forecasting watershed behavior in response to development. It starts with a general overview about modeling, including a discussion of what a model is and why modeling is useful. The first half of the course will focus on the piece-by-piece construction of a watershed model from the basic elements of a water budget. Focal points will include the identification of necessary data from existing sources, development of algorithms of appropriate scale and realism for the model objectives, and the construction and trouble-shooting of a dynamic watershed model. All modeling work will be done in Microsoft Excel, minimizing the need to master new computer tools prior to creating models. The second half of the course focuses on calibration and accuracy assessment, including a literature review of published model accuracies for the existing range of model sophistication. The primary learning outcomes are the ability to converse about the science underlying hydrologic models, and the ability to understand the limitations of models of varying complexity. A personal computer, preferably a laptop, is required for the course.

HOURS AND LOCATION

Class Time: Mon. (12:50-1:40 a.m.)

Location: Newins-Ziegler Hall 219

INSTRUCTOR

Matthew Cohen (Associate Professor)

328 Newins-Ziegler Hall

Class Website – http://sfrc.ufl.edu/ecohydrology/FWR_models.html

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RECOMMENDED TEXT(S)

- *Forest Hydrology: An Introduction to Water and Forests*. 2005. M. Chang (2nd Edition)

ADDITIONAL REFERENCE MATERIALS (available at course reserve in Marston Science Library)

- *Hydrology and the Management of Watersheds*. 2003. Brooks, K. et al. (3rd Edition)

- *Principles of Forest Hydrology*. 1982. J. Hewlett

- *Handbook of Hydrology*. 1992. D. Maidment

PERFORMANCE EVALUATION

Grading Scale:

A = 100-90

B+ = 89-86

B = 85-80

C+ = 79-76

C = 75-70

D+ = 69-66

D = 65-60

E <60

Grade Composition

Work Assignments (10)	50%
Final Report	50%

Notes:

- Work assignments are due one week after the period it was assigned. No credit for late work. Extra credit assignments will be made available.
- Your final report is due **Friday April 27th**. An report outline is provided below; more detailed instructions for writing a report are provided at the class website. Penalty for a late term report is one letter grade per day.
- Attendance is required for credit. Each unexcused absence after 1 will result in a loss of 5% of your overall grade.

FINAL REPORT

Your report will document the development and testing of your model, including what the model objectives were, a description of the model design (algorithms used for each element, and a rationale for why), a description of the calibration data and efficiency, and a “what-if” exploration of the model output that is consistent with the model objectives. For example, if the goal is to predict the effects of clear-cutting vs. selective logging on watershed output, the model should be run for both scenarios (and probably a reference setting) and the results compared. A discussion of model limitations and potential improvements is also expected. The report should be no longer than 10 pages.

MODELS OF FOREST WATER RESOURCES COURSE SCHEDULE (SPRING 2012)

Month	Week 1	Week 2	Week 3	Week 4
January	NO CLASS	NO CLASS (MLK)	Introduction and Course Description	Modeling – A General Overview
February	Model Performance and Complexity	Boundary Conditions	Rainfall	Evapotranspiration
March	Evapotranspiration	SPRING BREAK	Runoff	Changes in Storage
April	Testing the Model	Model Calibration and Validation	Using the Model	Final Report and Wrap-Up

ADDITIONAL INFORMATION

Academic Honesty:

The University of Florida requires all members of its community to be honest in all endeavors. Cheating, plagiarism, and other acts diminish the process of learning. When students enroll at UF they commit themselves to honesty and integrity. Your instructor fully expects you to adhere to the academic honesty guidelines you signed when you were admitted to UF. As a result of completing the registration form at the University of Florida, every student has signed the following statement: *“I understand the University of Florida expects it students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”* Furthermore, on work submitted for credit by UF students, the following pledge is either required or implied: *“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”* It is to be assumed all work will be completed independently unless the assignment is defined as group project, in writing by the professor. This policy will be vigorously upheld at all times in this course.

Software Use:

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources:

Students experiencing crisis or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. Both the Counseling Center and Student Mental Health provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal or lacking clear career and academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health is located on the second floor of the Student Health Services in the Infirmary.

1. *University Counseling Center*, 301 Peabody Hall, 392-1575; personal and career counseling: www.counsel.ufl.edu
2. *Student Mental Health*, Student Health Care Center, 392-1171, personal counseling: www.hsc.ufl.edu/shcc/smhs.htm
3. *Sexual Assault Recovery Services (SARS)*, Student Health Care Center, 392-1161, sexual assault counseling; and
4. *Career Resource Center*, Reitz Union, 392-1601, career assistance and counseling.

Students with Disabilities Act:

The Dean of Students Office coordinates the needed accommodations of students with disabilities. This includes the registration of disabilities, academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services, and mediating faulty-student disability related issues. *Dean of Students Office*, 202 Peabody Hall, 392-7066, www.dso.ufl.edu.