

**Virginia Polytechnic Institute and State University**  
**Department of Civil and Environmental Engineering**  
**CEE 5324 – Advanced Hydrology**  
**Spring 2010**

**Course Description:** Applications of statistics to hydrology, floods, and droughts; flow generation models; mathematical models in physical hydrology; difference methods in flow routing; kinematic wave; evapo-transpiration; infiltration; and atmospheric processes. X-grade allowed.

**Instructor:**

Dr. Glenn E. Moglen  
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Falls Church, VA 22043  
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Office Hours: MWF, 2:00 pm – 3:00 pm  
Th, 3:00 pm – 3:50 pm  
(or by appointment)

**Class times:**

Lecture: Thursday, 4:00 pm – 6:45pm, (NVC – 103, Blacksburg – Torg 1000)

**Web Page (requires Scholar login):**

<https://scholar.vt.edu/portal/site/6e2f8950-81fe-4cf9-a0cc-3de2a1289074>

**Video Streaming:**

<http://www.vbs.vt.edu/register?ID=3blbuktmgj6skc8osck8g0gss>

**Texts:**

**Required:**

- *There is no required text for this class. Handouts will be distributed as the course progresses.*

**Recommended:**

- Chow, V.T., D.R. Maidment, and L.W. Mays. *Applied Hydrology*. McGraw-Hill. 1988. ISBN 0-07-010810-2. (or any solid hydrology text that covers flood frequency analysis.)
- ESRI. *Getting to Know ArcGIS Desktop, Second Edition: Basics of ArcView, ArcEditor, and ArcInfo Updated for ArcGIS 9*. 2004. (1-58948-083-X)
- Matlab – Student Version. The Mathworks, Inc. (any version number is fine).

### Tentative Class Schedule:

<u>Date</u>	<u>Topic</u>	<u>Homework Due</u>
January	21 Course introduction – watershed characterization, unit hydrographs, convolution	
	28 Advanced unit hydrograph material: the GIUH and least squares/optimization approaches	Hwk. 1
February	4 Hydrologic routing - difference methods	Hwk. 2
	11 Hydrologic routing: explicit and implicit routing schemes	Hwk. 3
	18 Stream gaging: fundamentals	Hwk. 4
	25 Stream gaging: hydraulic geometry and rating tables	Hwk. 5
March	4 Exam 1 (Hwks 1 – 4)	Hwk. 6
	11 No Class – Spring Break	
	18 Flood Frequency Analysis(FFA): USGS flood data central concepts of FFA	
	25 Flood Frequency Analysis: use of PeakFQ program, handling outliers and historical values	Hwk. 7
April	1 Development of regional peak flow regression equations. GIS applications.	Hwk. 8
	8 Continued development of regional peak flow regression equations – statistical considerations.	Hwk. 9
	15 Exam 2 (Hwks 5 – 8)	Hwk. 10
	22 Drought frequency analysis	
	29 Finish drought frequency analysis, review/summary course evaluation, assignment of take-home final	Hwk. 11

*Scheduled topics may vary due to time or weather constraints. Due dates are tentative.*

**Homework Policy:** Homework is due at 3pm (*not 4pm*) on the indicated due date.

Homework should be submitted as a single PDF file in succinct form (explained on first day of class). I will print and grade a hard copy from this PDF. You can submit supplementary files with your homework that contain voluminous data or show how some long calculations were made. Late homework *may* be accepted, but at greatly reduced value.

**Take-Home Final Exam: Due on Friday, May 7 at noon**

**Grading Method:**

Homework:	30%
Intermediate Exams (2):	20% (each)
Final Exam:	30%

**Academic Integrity:** Please review the University’s Honor System (web site: <http://www.honorsystem.vt.edu>). This code applies to CEE 5324. I encourage group work in this class. However, I do not condone copying the work of others. If working as part of a group, I expect you to contribute your proportionate share to the group and to

understand all elements of the work completed, not just your part. There will be times during the semester when assigned work is to be completed solely by the individual. During these times you are not to share any work with other students in the class.

**Special Needs:** If you have a disability that may affect your performance in this class, or if a problem arises during the semester, you should make me aware of this as soon as possible. I will make every effort to accommodate you.

**Religious Observances:** If your observance of a religious holiday will affect your ability to attend class or complete an assignment on time, please inform me of this with at least a week's advance notice.

**My role as a teacher:** I will try to lead clear, informative, and interesting discussions on the course topic. I will assign homework/labs/exams that exercise concepts discussed in class and grade/return all materials promptly. I will make every effort to be available to you outside of class during my office hours and by e-mail, however please try to avoid unscheduled visits during non-office hours times. I will treat everyone fairly and with respect.

**Your Role as a Student:** You are expected to complete and turn in **all** assignments on the date due. Read the relevant class notes **prior** to the class in which they are discussed. Come to class ready to **think**, not just take notes. If something is unclear, please ask questions (in class, by e-mail, during my office hours). **Above all, ask questions.**

If you are experiencing difficulties in keeping up with the academic demands of this course, contact the University Academic Advising Center (web site: <http://www.uaac.vt.edu/success/index.html>). Their educational counselors can help with time management, reading, note-taking, and exam preparation skills.