University of Colorado Denver
College of Engineering and Applied Science
CVEN-5333 Surface Water Hydrology

Spring 2018
Lecture: Tu/Th 5:00—6:15 pm
Location: North Classroom 1521
Office Hours: Tu/Th 3:30-4:45 pm, → and by appointment (with 24 hour notice)

Instructor: David C. Mays, P.E., Ph.D.
Office: North Classroom 2014-A
Phone: 303-315-7570
E-mail: david.mays@ucdenver.edu
http://www.ucdenver.edu/dmays/5333

Catalog Description: Fundamentals of hydrology emphasizing surface water processes. Topics include the hydrologic cycle, frequency analysis, drought management, flood routing, rainfall-runoff relationships (rational method, unit hydrograph, and hydrologic software) and hydrologic design. 
Prerequisites: Graduate standing in engineering or instructor consent. Course requires Microsoft Excel.

Course Objectives: At the end of the semester, you should be able to:

1. Explain the hydrologic cycle and state the equations used to describe each sub-process.
2. Predict flood magnitudes from data, probability distributions, and recurrence intervals.
3. Choose the best modeling approach: rational method, unit hydrograph, or hydrologic software.
4. State the basic concerns and major regulations related to water quality.
5. Use hydrologic principles to design drainage, detention, and retention systems.


<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
<th>Reading Assignment*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/16, 1/18</td>
<td>Hydrologic Cycle</td>
<td>13.3, 1.1, 1.4, 2.1, 1.2, G-2009</td>
</tr>
<tr>
<td>2</td>
<td>1/23, 1/25</td>
<td>Precipitation and Infiltration</td>
<td>2.6, 1.3, 2.7</td>
</tr>
<tr>
<td>3</td>
<td>1/30, 2/1</td>
<td>Groundwater and Streamflow</td>
<td>8.1-8.3, 8.8, 2.8, 1.6, 1.8</td>
</tr>
<tr>
<td>4</td>
<td>2/6, 2/8</td>
<td>Snow Hydrology</td>
<td>2.9, P-1989 (Chapter 12, §3.2)</td>
</tr>
<tr>
<td>5</td>
<td>2/13, 2/15</td>
<td>Engineering Probability</td>
<td>3.1-3.7, C/M/M-1988a, DR-2011</td>
</tr>
<tr>
<td>6</td>
<td>2/20, 2/22</td>
<td>Drought Management (EXAM #1)</td>
<td>3.8, M-2005</td>
</tr>
<tr>
<td>7</td>
<td>2/27, 3/1</td>
<td>Reservoirs and Routing</td>
<td>4.1-4.3, 4.6 (260-267), 4.7 (272-276)</td>
</tr>
<tr>
<td>8</td>
<td>3/6, 3/8</td>
<td>Rational Method</td>
<td>1.5, 6.2 (346-349), 6.4 (359-367)</td>
</tr>
<tr>
<td>9</td>
<td>3/13, 3/15</td>
<td>Unit Hydrograph</td>
<td>1.7, 2.2, F-2002</td>
</tr>
<tr>
<td>10</td>
<td>3/27, 3/29</td>
<td>Synthetic Unit Hydrograph</td>
<td>2.3-2.5</td>
</tr>
<tr>
<td>11</td>
<td>4/3, 4/5</td>
<td>HEC-HMS (Hydrologic Software)</td>
<td>5.1-5.6</td>
</tr>
<tr>
<td>12</td>
<td>4/10, 4/12</td>
<td>Contaminant Hydrology (EXAM #2)</td>
<td>N/AC-2001</td>
</tr>
<tr>
<td>14</td>
<td>4/24, 4/26</td>
<td>CUHP (Hydrologic Software)</td>
<td>U-2016</td>
</tr>
<tr>
<td>15</td>
<td>5/1, 5/3</td>
<td>Floodplain Management</td>
<td>9.5, 12.1-12.6, 13.5</td>
</tr>
</tbody>
</table>


Midterms: Thursday 2/22/2018 (weeks 1-4), Thursday 4/12/2018 (weeks 1-9).
Final Exam: To be scheduled during Exam Week (Monday 5/7/2018 to Friday 5/11/2018)
Grades: 20% homework, 20% each midterm, 35% final exam, 5% participation.
Homework
Homework will be assigned in class each Tuesday or through the “Assignments and Answers” link on the course website, and will be due in class Thursday of the next week. Engineering paper is strongly encouraged but not required. I reserve the right to return homework for re-write and re-submit if it is (1) illegible, or (2) does not comply with the following standards:

1. At the top of each page, write your name, class number, homework number, due date, and page of total. For example, for a 5-page submission, the first page is 1 of 5, the second 2 of 5.
   → If you are submitting late, also write the date submitted on the first page.
2. Draw a picture for each problem. Use a straight edge for straight lines.
3. Briefly restate each problem in your own words. Do not copy the problem statement verbatim.
4. State what you are going to calculate under heading FIND.
5. State any relevant assumptions, including assumed precision of input numbers.
6. Indicate the units for all numbers, not just final results, except for dimensionless ratios.
   a. Please write 5 ft rather than 5’ and 8 in rather than 8”.
   b. Units like psi are fine for results, but use lb/in² to show unit cancellation in work.
   c. Use the same units (metric or US) as the problem statement.
7. Write each result, with the correct number of significant digits, on its own line.

These standards will help you establish the professional habit of producing clear calculations in compliance with given requirements. You will produce a set of documents that you may reference down the road for your FE and/or PE exam. These standards will also simplify grading, which means you get your homework back faster, and they keep the grader happy—which is always a good thing. Homework grades are A (100%), B (85%), C (75%), D (65%), and F (0%). Homework will be graded for correctness, approach, and presentation. To earn an A, you must clearly and correctly calculate all the problems while fully complying with the standards.

- Late homework will be penalized by 10% per class (except by 15% from A→B). However, no credit will be granted for assignments whose solutions have been posted online.
- Late homework not stating the date submitted will be penalized by one additional letter grade.
- Unstapled homework (with more than one sheet of paper) will be penalized by one letter grade.
- Except by prior arrangement, homework submitted electronically or any time outside office hours or class will be penalized by one letter grade.

Participation
Rationale for participation grade: Learning is an activity that we perform (like dancing, fixing cars, or skiing) rather than a commodity that we purchase. I will attempt to call on each of you each week. You are expected to reply every time. Why? Because you are training to become a professional, who will be called upon to speak up and answer technical questions. People will expect you to be prepared. This means you should complete the reading assignment before class. If you make a habit of missing class, your participation grade will suffer.
Communication
You are required to check your official university e-mail account at least once every 24 hours during business days, or arrange to have your e-mail from this account forwarded to another e-mail account that you check at least once every 24 hours during business days. For details, see the university website.*

Academic Integrity
This course will comply with the 2017-2018 Undergraduate Catalog or 2017-2018 Graduate Catalog, including the Academic Integrity And Discipline Policies,† and with the Student Honor Code for the College of Engineering and Applied Science. You must perform and present your own work. Studying with others may be useful, but copying assignments—from a solutions manual, from other students, from a paid tutor, or from any other source—or cheating on exams will not be tolerated. Midterm and final exams will be governed by an Exam Policy to be distributed separately. Importantly, to avoid plagiarism, cite your sources using American Society of Civil Engineers format.‡

General
• Snow Closure Hotline 877-556-3637.
• I am happy to work with students needing special accommodations. The university asks students to register with Disability Resources and Services (DRS), who then evaluate each situation on a case-by-case basis. I will provide accommodations per the official letter I receive from DRS.
• Missed exams will receive an F, except (a) when special arrangements have been made with me ahead of time, or (b) with documentation of a medical emergency.
• Unclaimed homework, reports and exams will be destroyed on or after 6/1/2018.
• Grades will not include plus or minus designations.
• Syllabus subject to revision.
• Students are responsible for all material presented in lecture, readings, homework, and communicated by e-mail.

Finally, this semester’s Academic Calendar and our Student Honor Code are attached below. If you have not done so already, please sign the Student Honor Code and return it to the department office.

Welcome to the class!

* http://www.ucdenver.edu/email/Pages/Email-Resources.aspx
† http://catalog.ucdenver.edu/content.php?catoid=22&navoid=5925
‡ http://ascelibrary.org/doi/pdf/10.1061/9780784478998.ch17
### Important Notes

- First day to apply for Spring Graduation via [UCDAccess](http://ucdaccess).
- Registration begins for Spring Semester via UCDAccess. Check UCDAccess for your specific registration date and time assignment.
- For best course selection, register as soon as possible after your registration time assignment.
- NEW students, prior to registering a $200 Registration Advance Payment is required, it will be applied to your tuition and fees.
- For additional billing/financial information, instructor approval is not required to drop the class within the first 15% of class meetings.
- Module/Intensive classes may be added up until the first day of the class. After the first day of class, late starting module or intensive classes will not be deducted from eligible student’s lifetime hours.
- Instructor approval to add classes using UCDAccess.
- Military students, prior to registering a $200 Registration Advance Payment is required, it will be applied to your tuition and fees.
- Military students must access their student account and billing information through UCDAccess. Check UCDAccess for your specific registration date and time assignment.
- Your college may require dean’s approval prior to this date; Deadlines for last day to withdraw vary by school/college, please contact your advisor.

### Important Deadlines

**NOVEMBER**

- 1: First day to apply for Spring Graduation via [UCDAccess](http://ucdaccess).
- 1-16: Registration begins for Spring Semester via UCDAccess. Check UCDAccess for your specific registration date and time assignment.
- 8: Residency priority review deadline date
- 8: Last day to petition for resident tuition status.
- 15: Martin Luther King Jr. Holiday
  - Last day to DROP all classes via UCDAccess and receive a refund of the $200 advance payment. No tuition assessed.
- 16: First day of Spring semester classes
  - First day faculty/staff may register with a tuition waiver.
- 21: Last day to WAITLIST classes using UCDAccess.
- 22: Last day to drop a class without a $100 drop charge.
  - No adds permitted today.

**DECEMBER**

- 8: Last day to submit the online out-of-state tuition application.
- 15: Last day to DROP all classes via UCDAccess and receive a refund of the $200 advance payment. No tuition assessed.
- 31: From January 23rd – January 31st you will need instructor approval to add
  - CENSUS DATE – until 5:00 PM.
  - Last day to ADD full term classes with instructor approval.
  - Last day to DROP full term classes with a financial adjustment.
  - Last day to request No Credit or Pass/Fail grade for a class.
  - Last day to apply for Spring graduation via UCDAccess.
  - After this date, contact your advisor

**JANUARY**

- 19-25: Spring Break
- 22: From January 23rd – January 31st you will need instructor approval to add
  - From January 23rd – January 31st you will need instructor approval to add
  - CENSUS DATE – until 5:00 PM.
  - Last day to ADD full term classes with instructor approval.
  - Last day to DROP full term classes with a financial adjustment.
  - Last day to request No Credit or Pass/Fail grade for a class.
  - Last day to apply for Spring graduation via UCDAccess.
  - After this date, contact your advisor
- 31: The 23rd is the first day an instructor may approve a request to add a student to a closed class.
  - After this date, you will be charged the full tuition amount for additional classes added – College Opportunity Fund hours will not be deducted from eligible student’s lifetime hours.

**MARCH**

- 19-25: Spring Break
  - No classes. Campus open.

**APRIL**

- 2: First day the Office of the Registrar requires a dean’s signature on a Schedule Adjustment Form to withdraw from a class.
  - Your college may require dean’s approval prior to this date; Deadlines for last day to withdraw vary by school/college, please contact your advisor.

**MAY**

- 7-12: Finals week
- 12: End of semester – Commencement.
  - Last day to authorize College Opportunity Fund (COF) via UCDAccess
- 17: Final grades available on UCDAccess and transcripts (tentative).

**JUNE**

- 22: Spring degrees posted on UCDAccess and transcripts (tentative).
  - This is the date your degree will be recorded on your transcript; diplomas won’t be mailed out until July 13.

### Additional Billing/Financial Information:

- The ONLY exception to the $200 Registration Advance Payment requirement is if the Financial Aid Office has received your FAFSA data and you have completed the University Application for Financial Aid. (2) Students are responsible for complying with tuition/fees deadlines. All registered students must access their student account and billing information through UCDAccess. You will also receive an electronic bill to your university email account.

### Important Dates

- **Maymester Classes:**
  - May 14: Maymester Classes begin
  - May 28: Memorial Day Holiday – No classes
  - May 31: Maymester Classes End

- **Summer Classes:**
  - June 4: Summer Classes begin
  - July 4: Independence Day Holiday – No classes
  - July 28: End of semester

- **Fall Classes:**
  - Aug. 20: Classes begin
  - Sept. 3: Labor Day Holiday – No classes
  - Nov. 19-25: Fall Break – No classes
  - Nov. 22: Thanksgiving Day Holiday – No classes
  - Dec. 15: End of Semester - Commencement
Student Honor Code

The Honor Code outlined below is the College of Engineering and Applied Science statement on academic integrity. The Code articulates the College’s expectations of its students and faculty in establishing and maintaining the highest standards in academic work.

Honor Code Text
The Honor Code of the College of Engineering and Applied Science is a statement of its students, individually and collectively:

• Students will not give or receive aid during examinations.
• Students will not use any prohibited electronic devices during examinations.
• Students will not give or receive unpermitted aid in class work, in the preparation of reports, or in any other work that is to be used by the instructor as the basis of grading.
• Students will uphold the spirit and letter of the Honor Code and they will take an active role to ensure that others uphold the Honor Code and if they observe violations of the Honor Code they must report violations to their Department Chair.
• The Faculty of the College will do its part to ensure its confidence in the honor of its students. Faculty must ensure that precautions are in place to prevent the forms of dishonesty mentioned above. Faculty will also avoid, as far as practical, academic procedures that create temptations to violate the Honor Code. Faculty alone has the right and obligation to set academic requirements. However, the students and faculty will work together to establish optimal conditions for honorable academic work.

Violations of the Honor Code
Examples of conduct that will be regarded as being in violation of the Honor Code include:

• Copying from another’s examination paper or allowing another to copy from one’s own paper.
• Plagiarism in any shape or form. Plagiarism is defined as the use, without giving reasonable and appropriate credit to or acknowledging the author or source, of another person’s original work, whether such work is made up of code, formulas, ideas, language, research, strategies, writing or other form(s).
• Giving or receiving unpermitted aid either in person or via electronic devices.
• Engaging in unauthorized collaboration on academic assignments or examinations.
• Representing as one’s own work the work of another.

Penalties for Violating the Honor Code
Most student disciplinary cases have involved Honor Code violations. Of these, most cases arise when a student submits another’s work as his or her own, gives or receives unpermitted aid, or engages in unauthorized collaboration. If a violation occurs during a quiz or on a homework assignment, the student will receive a zero for that quiz or assignment. If a violation occurs on an examination, the student will receive a failing grade for the course. The standard penalty for a first offense may include suspension from the College of Engineering and Applied Science for a severe infraction of the Honor Code. The penalty for a second violation will be expulsion from the College of Engineering and Applied Science.

It is the responsibility of the student to seek clarification from the instructor when in doubt about these guidelines.

By signing below, I affirm that I have read and understood the Student Honor Code and will abide by its provisions.

______________________________________  _________________
Student Signature     Date