Hydrogeology Laboratory (Geology 471) Syllabus
Fall 2015, Tues. 3:00 pm

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Office Hours: Monday, Tuesday, and Friday; 10:00 am - 12:00 pm

Lab Instructor: Joseph Krienert
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Office: Parkinson 105
Office Hours: Monday 10 am – 11:50 am, Wednesday 8 am – 9:50 am, Thursday 9:00 – 10:50 am

Recommended Text:

General Information:
This course includes problem sets, laboratory experiments, and field exercises in hydrogeology. The student will become familiar with field instrumentation, methodology, and analytical techniques. Some assignments will introduce problem solving using popular spreadsheet programs and groundwater modeling software. The course organization parallels that of Geology 470 (Hydrogeology). Geology majors are required to take both Geology 470 and Geology 471 concurrently.

Field Trips:
There will be a required field trip during normal lab hours on September 8th. The $5.00 cost for travel via SIU vehicles is included in your Bursar account billing. Water will be provided.

A *recommended* (optional) field trip will take place on Saturday September 26th. We will be traveling through the locality associated with your final project and making stops to investigate the geology in the region of interest. Transportation will be covered by the Geology department, but you will need to bring a sack lunch and water. Please RSVP regarding this trip no later than Friday September 4th.

Laboratory Requirements:
Lab assignments will consist of multiple questions based upon numerical data as well as conceptual problems. A working knowledge of Excel is helpful.

I will accept the lab assignments either in person at the start of the following lab period or by e-mail. In either case the assignment is due at the beginning of class.

For labs that require extensive use of a spreadsheet, include all relevant files so that potential problems in your work can be identified.

Semester Project:
Each student is responsible for a course project determining the capture zone of a community water district supplied by groundwater wells. You will be using Graphic Groundwater, a graphical user interface program that uses MODFLOW and MODPATH, to set up, model flow, and track particles for your particular area. In order to help you on the construction of your models, several milestones are due as the semester progresses which will force you to continually
work on your model and not procrastinate until the end of the semester. We will discuss the
details of the project as we go through the semester, but you will write a research paper
discussing important details on the construction of your model. Projects are due at the end of the
course usually during the week of finals.

Grading:
This course grading is based on assignments and not tests. No final is scheduled.
Grading is based on weekly assignments (reports, milestones, or other data sets), and a final
semester project. All assignments must be turned in by 3:00 PM on the date they are due. Any
late assignments will be reduced by 10% each day they are late.

Semester Project (paper and numerical computer model) – 20%
Weekly assignments (lab reports, milestones, data sets) – 80%

Weekly Assignment Rubric:

1. Research > 10 < =========== > 1
2. Purpose/Problem > 10 < =========== > 1
3. Procedure > 10 < =========== > 1
4. Data & Results > 10 < =========== > 1
5. Errors > 10 < =========== > 1
6. Conclusions > 10 < =========== > 1
7. Spelling & Grammar > 10 < =========== > 1
8. Cooperation > 10 < =========== > 1
9. Organization > 10 < =========== > 1
10. Timeliness > 10 < =========== > 1

Total = _______ out of 100

Course Outline (subject to change):

<table>
<thead>
<tr>
<th>Date</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-25</td>
<td>Introduction to Hydrogeology Lab</td>
</tr>
<tr>
<td>8-1</td>
<td>Darcy’s Law and Porosity Experiments</td>
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<tr>
<td>9-8</td>
<td>(Fieldwork) Seepage Meter on the Mississippi</td>
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<tr>
<td>9-15</td>
<td>(Fieldwork) Well Drilling Exercise</td>
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<tr>
<td>9-22</td>
<td>Groundwater Modeling a Capture Zone: Introduction to Semester Project (Esling)</td>
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<tr>
<td>9-26</td>
<td>(Fieldwork) Travel to Project Focus Site</td>
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<tr>
<td>9-29</td>
<td>(Open Week) Work on Semester Projects</td>
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<tr>
<td>10-3</td>
<td>Groundwater Modeling / Capture Zone Advanced Topics (Esling)</td>
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<tr>
<td>10-13</td>
<td>No Lab – Fall Break</td>
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<tr>
<td>10-20</td>
<td>(Fieldwork) Slug Testing and Groundwater Sampling Techniques</td>
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<tr>
<td>10-27</td>
<td>Baseflow with USGS HYSEP Program</td>
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<tr>
<td>10-3</td>
<td>Well Hydraulics and Curve Matching</td>
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<tr>
<td>11-10</td>
<td>Hydrogeologic Testing Methods (Esling)</td>
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<tr>
<td>11-17</td>
<td>(Open Week) Work on Semester Projects</td>
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<tr>
<td>11-24</td>
<td>Model Calibration and Sensitivity Analysis with R/K Ratio (Esling)</td>
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<tr>
<td>12-1</td>
<td>(Open Week) Work on Semester Projects</td>
</tr>
<tr>
<td>12-8</td>
<td>Final Semester Project Presentations</td>
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Emergency Procedures:
Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT’s website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.