Physical Hydrology: EARTH SC / ENVIR 2W03

Outline Winter 2018

Instructor: Dr. Sean K. Carey, GSB-238
Phone: 905-525-9140 ext. 20134
Email: careysk@mcmaster.ca

Lectures: MDCL 1110
Monday: 13.30-14.20
Wednesday: 13.30-14.20

<table>
<thead>
<tr>
<th>Section</th>
<th>Day</th>
<th>Start</th>
<th>End</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>L01</td>
<td>Th</td>
<td>09:30</td>
<td>11:20</td>
<td>KTH 105</td>
</tr>
<tr>
<td>L02</td>
<td>Tu</td>
<td>12:30</td>
<td>14:20</td>
<td>KTH B102</td>
</tr>
<tr>
<td>L03</td>
<td>Tu</td>
<td>15:30</td>
<td>17:20</td>
<td>BSB 238A</td>
</tr>
<tr>
<td>L04</td>
<td>Mo</td>
<td>11:30</td>
<td>13:20</td>
<td>KTH B105</td>
</tr>
<tr>
<td>L05</td>
<td>Mo</td>
<td>14:20</td>
<td>16:20</td>
<td>BSB 121</td>
</tr>
</tbody>
</table>

Prerequisite: ENVIR SC 1A03, 1B03, 1G03 or ISCI 1A24. ENVIR SC 1A03 or ISCI 1A24 is strongly recommended

TA: Kelly Biagi (biagikm@mcmaster.ca)
    Erin Nicholls (nicholem@mcmaster.ca)
    Nicole Sandler (sandlen@mcmaster.ca)

Description:
Hydrological processes including precipitation, snowmelt, hillslope runoff, streamflow and hydrological data analysis.

Objective:
Hydrology can be defined as the study of the hydrologic cycle: the continuous movement of water from the atmosphere to the surface of the earth, into the surface, through the subsurface, and back to the atmosphere (this of course is very simplified). The objective of this course is to give the student an introduction to hydrological processes and the resulting spatial patterns of precipitation, evaporation, snowmelt, subsurface flow and runoff at local, regional and global scales. Where possible, Canadian examples are used as illustrations. As hydrology is a quantitative science, assignments involving calculations and the use spreadsheets form an important part of the course.
Readings:

Lecture Notes: Will be available on Avenue to Learn

Assignment Material: Will be available on Avenue to Learn

Calendar:
The class topics, lab schedule and readings will be posted on Avenue to Learn. There will be some flexibility in the timing based on material difficulty.

Assignments:
There are eight labs/assignments. Assignments will be due at the beginning of the FOLLOWING LAB they are assigned. For example, lab 1 is due the start of lab 2. Late labs are not accepted and will be given a grade of 0. Labs must be handed in at the beginning of the lab period.

Course Topics Include:

Hydrology. Water Balances and the Global Water Cycle
Precipitation (types, patterns, measurement, estimation, statistics)
Interception (storage, throughfall, stemflow)
Evaporation (processes, soils, vegetation, patterns)
Snow (properties, mechanisms, energy, meltwater)
Soil Water (infiltration, profiles, forces on soil water, soil moisture characteristics, Darcy’s law, soil water flow)
Runoff (discharge, runoff generation mechanisms, runoff statistics, routing, Canadian runoff regimes)

Mark Distribution: Assignments/Labs (8) 32% (Total)
Test 1 (February 14) 26%
Final Examination 42%

There will be eight assignments introduced during the lab period. You will be responsible for knowledge of the assignment material on the tests. Certain classes will be used to discuss and work on the assignment and may be managed by the TA.

There is one test and a final exam. The test and exam will include lecture, lab and reading material.

The university reserves the right to change any aspect of this course outline.
Academic Integrity: You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at www.mcmaster.ca/academicintegrity

The following illustrates only three forms of academic dishonesty:
1. Plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

In this course we will be using Avenue to Learn. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with myself.