1 INSTRUCTIONAL SUPPORT

1.1 Instructor

Instructor: Bahram Gharabaghi, Ph.D.,
P.Eng. Office: THRN 2417, ext. 58451
Email: bgharaba@uoguelph.ca
Office hours: TBA on Courselink or by appointment

2 LEARNING RESOURCES

2.1 Course Website

Course material, announcements, and grades will be regularly posted to the Courselink site. You are responsible for checking the site regularly.

2.2 Required Readings

1. Required readings will be assigned throughout the term.

2.3 Recommended Resources

1. Runoff Monitoring: quality and quantity test methods; Bellinger, William Y United States
   Available online: http://babel.hathitrust.org/cgi/pt?id=mdp.39015038619154;view=1up;seq=5
   Available online: https://books.google.ca/books?id=iGlmc8G3H2sC&printsec=frontcover
3 ASSESSMENT

3.1 Dates and Distribution

Weekly Critical Literature Reviews and Class Presentations: 10% x 5 = 50% - students will select a peer-reviewed paper from a suggested reading list and prepare a one-page critical review of the paper. This will allow the students the opportunity to independently research the latest advances in theory and fundamental concepts as well as new technology on measurement of water quantity and quality. Students will also prepare a PowerPoint presentation and present the critical review of the paper to the class. The one-page critical reviews and the PowerPoint presentations must be submitted electronically on Courselink by noon and presented in-class on the due dates, as follows:

Presentation 1, due May 20th
Presentation 2, due June 3rd
Presentation 3, due June 10th
Presentation 4, due June 17th
Presentation 5, due June 24th

Research Proposal and Class Presentation: 15% + 5% = 20% - due Mon. June 29th - to be submitted electronically on Courselink Dropbox by noon and presented in-class on the due date. The proposal will concisely (less than 7 pages) discuss a well-defined problem to be researched; include a brief chronologic review of previous work on the selected topic with key references; outline the objectives and scope of the proposed work to be conducted; briefly suggest key data that needs to be compiled and engineering tools that will be used; and discuss the key deliverables; late submissions will have a penalty of 25% per day.

Research Brief: 30% - due Wednesday July 29th - to be submitted electronically on Courselink Dropbox. Studies published as Research Briefs have a very focused and explicit purpose, and applied relevance. For successful completion of this course, each graduate student will write a term project report as “Research Brief” on a topic approved by the instructor – a short paper (no longer than 15 pages, inclusive of tables, figures, and references) that is focused on a specific technique, process or model that have broad significance to the measurement of water quantity or quality. The structure should be similar to that of a regular journal paper but greatly condensed for rapid communication and is focused on a single important and timely point. The research brief will analyze and synthesize technical data and argue from a hypothesis; produce new knowledge, insight on the focused research topic; and show a breadth of understanding in drawing out implications and making connections between the key observations.

3.2 Course Grading Policies

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please email the course instructor. Please note the passing grade in graduate courses is 65%. See the graduate calendar for information on regulations and procedures for Academic Consideration:
http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e1400.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml
4 AIMS & OBJECTIVES

4.1 Course Description
This course covers techniques used to measure rates of movement and amounts of water occurring as precipitation, soil water, ground water and streamflow. Available measurements of water quality are surveyed. Calculation procedures involved in the use of indirect indicators of water quantity and quality individually and in combination are described. Prerequisite(s): none; Restriction(s): none

4.2 Course Aims
This course aims to introduce both the capabilities and limitations of new methods and recent advancements in measurement of water quantity and quality. Students are encouraged to select a research topic of their interest – within the general topic of measurement of water quantity and quality - to solve creative, practical problems, including research and synthesis of data and conceptual theory and methods; communicate their ideas professionally and connect with their intended audience. Successful students will demonstrate both independence of thought and depth of understanding.

4.3 Learning Objectives
At the successful completion of this course, the student will have demonstrated:

1. an understanding of the theory and application of water measurement techniques
2. the ability to design a monitoring program for a variety of projects
3. an understanding of the natural background levels and threshold values
4. the ability to use specialized computer programs for analysis of data gaps
5. knowledge of the limitations of the data and application of statistical analysis tools
6. articulate the major approximations in modeling techniques and associated errors
7. interpret and communicate research results in a final report

4.4 Instructor’s Role and Responsibility to Students
The instructor’s role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courserlink/D2L but these are not intended to be stand-alone course notes. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for tests and project.

4.5 Students’ Learning Responsibilities
Students are expected to take advantage of the learning opportunities provided during lectures and tutorials. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

E-mail Communication: As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

Recording of Materials: Presentations which are made in relation to course work—including lectures—cannot be recorded in any electronic media without the permission of the presenter, whether the instructor, a classmate or guest lecturer.
5 Teaching and Learning Activities

5.1 Class Time and Location

Lectures/Seminars:
Monday and Wednesday 6:00 – 8:50  THRN 1002

5.2 Class Schedule

• Mon. May 11th: First Class Meeting at 6:00 PM in THRN 1002
• Wed. May 13th: Measurement and analysis of climatic data
• Mon. May 18th: NO CLASSES SCHEDULED
• Wed. May 20th: Measurement and modeling of soil moisture
• Mon. May 25th: NO CLASSES SCHEDULED
• Wed. May 27th: Hydrometric data measurement and analysis
• Mon. June 1st: NO CLASSES SCHEDULED
• Wed. June 3rd: Hydrometric data modeling techniques
• Mon. June 8th: Water quality data collection and analysis
• Wed. June 10th: Advances in water quality modelling techniques
• Mon. June 15th: Groundwater data measurement and analysis
• Wed. June 17th: Groundwater data modeling techniques
• Mon. June 22nd: Data gap and statistical analysis tools
• Wed. June 24th: Natural background levels and threshold values
• Mon. June 29th: Term paper proposal presentations

5.3 Other Important Dates

Drop Date: The last date to drop one-semester courses, without academic penalty, is the 40th class day for one-semester courses (Friday July 3rd, 2015). Two-semester courses must be dropped by the last day of the add period in the second semester. Refer to the Graduate Calendar for the schedule of dates:
http://www.uoguelph.ca/registrar/calendars/graduate/current/sched/sec_d0e736.shtml

6 Lab Safety

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.
7 Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University’s policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

8 Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: https://www.uoguelph.ca/diversity-human-rights/accessibility

9 Resources

- The Academic Misconduct Policy is detailed in the Graduate Calendar: http://www.uoguelph.ca/registrar/calendars/graduate/2013-2014/genreg/sec_d0e1911.shtml
- A tutorial on Academic Misconduct produced by the Learning Commons can be found at: http://www.academicintegrity.uoguelph.ca/
- The Graduate Calendar is the source of information about the University of Guelph’s procedures, policies and regulations which apply to graduate programs: http://www.uoguelph.ca/registrar/calendars/graduate/current/
- Refer to the Graduate Calendar for the schedule of dates: http://www.uoguelph.ca/registrar/calendars/graduate/current/sched/sec_d0e736.shtml