

Earth Sciences 3340a - Fall 2025 Course Outline

1. Course Information

Earth Sciences 3340a/b Watershed Hydrology

Schedule: Thursday's – lectures (section 001) 10:30 a.m. to 12:20 p.m.; lab (section 002) 1:30 to 3:20 p.m.

Prerequisites: Any 1.0 course equivalent at the 1000 level from Calculus, Mathematics, Applied Mathematics, Numerical and Mathematical Methods, Data Science, or Statistical Sciences.

- *Unless you have either the prerequisites for this course or written special permission from the Department of Earth Sciences to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline for the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.*

2. Instructor Information

Instructor: Rob Schincariol, Ph.D., P.Geo.

519-661-2111, ext. 83732, schincar@uwo.ca

Office Hours by appointment – email and a time will be arranged that meets both our schedules.

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

GTA: Tessa Lacasse, tlascass@uwo.ca

3. Course Syllabus, Schedule, Delivery Mode

Description: Occurrence, movement, and behavior of water in the hydrologic cycle. The development of quantitative representations of hydrologic processes (e.g. precipitation, evapotranspiration, runoff, infiltration and unsaturated flow, saturated flow, surface flow). Analysis of stream response hydrographs. Statistical models of predicting flood responses and water resource management.

Learning Outcomes

Upon successful completion of this course students will be able to:

- Apply quantitative skills to assess and evaluate all components of the hydrologic cycle including precipitation, evapotranspiration, surface water flow, unsaturated zone flow, and ground water flow.
- Framework calculations of hydrologic quantities, and water balances, within their respective data limitations, including model error and measurement error, both spatially and temporally.
- Delineate watersheds topographically and evaluate how topographic and subsurface hydrogeology processes affect watershed divides and basins.
- Assess current and historical precipitation patterns from online radar, satellite, and ground-based measurements.
- Assess historical and 'realtime' streamflow hydrographs both online and in the field through application of current meter, float, and dilution gaging methods.
- Comparative calculation of evapotranspiration through evaporation pan, water balance, FAO Penman-Monteith, and Thornthwaite and Mather models.
- Assess field saturated hydraulic conductivity and matric flux potential using the Guelph permeameter.
- Assess unsaturated hydraulic conductivity using a tension infiltrometer.
- Construct potentiometric maps and quantify ground water flow vectors and velocities.
- Quantify event and stream base flows using runoff models.
- Improve presentation skills ability.

Detailed Schedule

Sept. 4	lecture 1 – <i>start working on and reviewing solutions for lab 1</i>
Sept. 11	lecture 2; lab 1 help session
Sept. 18	lecture 3; lab 2 help session
Sept. 25	lecture 4; lab 3 help session
Oct. 2	lecture 5; lab 4 help session
Oct. 9	lecture 6; lab 5 help session
Oct. 16	lecture 7; lab test 1 (1:30 – 3:00 p.m. held in SSC 3018).
Oct. 23	lecture 8; lab 6 help session
Oct. 30	Group presentation (draft) submission deadline 3:30 p.m. via Owl. No lecture or lab – use time to work collaboratively on your group presentation.
Nov. 13	Lecture test – (11:00 a.m. to 12:00 p.m.) lectures 1 to 8 (held in PAB 148); no lab
Nov. 19	All group presentations due by 12:00 p.m. (via Owl)
Nov. 20	Group Presentations 1 in lecture; lab 7 help session
Nov. 27	Group Presentations 2 in lecture; no lab
Dec. 4	No lecture. lab test 2 (1:30- 2:30 p.m. held in SSC 3018).

Contingency plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

4. Course Materials

Text: Physical Hydrology 3rd Edition, S. Lawrence Dingman, ISBN 978-1-4786-1118-9, 2015 Waveland Press. Textbook in hard copy (new & used) and electronic formats is available directly various vendors. Examples include:

- VitalSource <https://www.vitalsource.com/en-ca/textbooks?sort=&term=dingman+physical+hydrology>
120 days rental \$70.90
- amazon.ca Kindle Edition \$131.13
- google Play Ebook \$104.47
- amazon.com various used textbooks for sale
- Waveland Press \$127.95 U.S. <https://www.waveland.com/browse.php?t=382>

You will absolutely require the textbook as lectures and lab work directly with material / figures from the text that are not reproduced in the lecture slides. The lectures will guide you into what sections (and what ‘depth’) you are required to understand. This text is routinely used in practice. As such it is quite extensive and goes into much greater depth on many topics than is required for this course.

Students should check OWL Brightspace <https://westernu.brightspace.com/> on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

If students need assistance with the course OWL site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

The main purpose of the lectures is to help you understand key hydrological processes and techniques used to quantify these processes. The labs apply the techniques. Case studies / consulting reports give you the real-world application of these techniques.

Technical Requirements – A stable internet connection, computer with working microphone and webcam, Microsoft Excel software, ability to print in colour (at home or store front), scanner or camera (cell phone is fine).

5. Methods of Evaluation*

<u>Marking Scheme:</u>		<i>Date</i>	<i>Makeup date for those granted Accommodation</i>
Lab test 1 (90 minutes)	20%	Oct. 16	Oct. 30 10:30 a.m. PAB 148
Lab test 2 (60 minutes)	10%	Dec. 4	Dec. 9 (to be determined)
Lecture test (60 minutes)	30%	Nov. 13	Nov. 20 12:30 p.m. BGSB 1053
Group presentations draft submission	10%	Oct. 30	reweighted to lecture test
Group presentations final presentation	30%	Nov. 20 & 27	reweighted to lecture test.

NO FINAL EXAM

* Tests

- All tests will be ‘closed book’. All work must be done independently. Not adhering to these conditions will be considered a scholastic offence. *Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.*
- Lab tests - No aids permitted other than basic non-memory calculator, pencils / pen, ruler, protractor. Cell phones must remain on ‘silent’ and in bags / backpacks. Lab tests involve calculations and are based on lab material. However, an understanding of lecture material is often required to do the labs.
- Lecture tests no aids permitted (pen or pencil only). Cell phones must remain on ‘silent’ and in bags / backpacks.
- Lecture test - You will be provided with a list of possible questions approximately 1 week ahead of the test. You should also use the washroom prior to the test as the ability to take breaks will be very limited (i.e. emergency only). As per university policy GTA’s must accompany students to the washroom which will necessitate only one student leaving the room at a time. This is one reason the tests are kept as short as possible.
- You are strongly encouraged to attend all lectures and take notes. Tests focus on material discussed in class within certain contexts. If you miss lectures you will not understand how to answer the test questions properly.
- All work must be done independently. Not adhering to these conditions will be considered a scholastic offence. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

*Group Presentations

- While the group is evaluated for the grading individual members may receive a higher or lower grade than ‘the group’. Group presentations are such that each member of the group will be responsible for a given component of the water budget. As such each group member will present their work on this component as part of the overall group presentation. This will allow for adjustments to individual grading should certain member perform well above or below the group average.
- All group presentations are due by noon Nov. 19 via Owl submitted as a ‘ppt show’. Late submissions will receive a 20% per day penalty.

Generative AI Tools (ChatGPT, Copilot, Gemini) are **prohibited** in this course.

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation.

- lab test 2

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Evaluation Scheme for Missed Assessments

Tests have defined make up dates (see above). Missed group presentations will be reweighted to the lecture test.

6. Additional Statements

Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca/>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as "appeals")

Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

Scholastic Offences

Policy on Scholastic Offences: https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a *scholastic offence*, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.

Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is your responsibility to seek clarification before using any AI tools in academic work.

Support Services

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic-related matters:

<https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at Learning Development and Success (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.