

INTEG 120: The Art & Science of Learning

Tuesdays & Thursdays, 2:30-3:50pm, EV2-2069

Instructor & Teaching Assistants

PROFESSOR

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TEACHING ASSISTANTS (TAs)

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Course Description

This course introduces students to state-of-the-art scientific research on learning and cognitive adaptability. We will discuss how to develop “smart” goals, deploy effective learning strategies, identify and reduce cognitive biases, cultivate a growth mindset, and improve self-regulation to become a more effective learner. These cognitive strategies are essential for maximizing your ability to learn effectively and efficiently, but they are not the whole story – your physical health, mental wellbeing, and social connections also affect your ability to learn, remember, create, and problem-solve, so we will look at these aspects as well. Finally, we will discuss how to thrive in university, both inside and outside the classroom. If you put in the work, you will develop an appreciation for how the psychological sciences can enhance your learning, enabling you to develop key skills to improve your thinking *and* your wellbeing.

Learning Objectives

By the end of this course, you should be able to achieve the following objectives. Those on the left involve basic levels of understanding, while those on the right involve higher levels on [Bloom’s Taxonomy of Learning](#).

Knowledge & Comprehension	Analysis & Application
Describe effective learning strategies	Employ those strategies to improve your own learning
Recognize cognitive biases, fallacies, and illusions	Mitigate biases and other thinking pitfalls
Distinguish between fixed vs. growth mindset	Cultivate more growth-oriented thoughts
Identify ways to enhance a learning environment	Design a learning environment that works for you
Articulate the concept of metacognition	Improve your own metacognitive abilities
Explain the relationship between learning & self-care	Practice self-care and enhance your wellbeing
Identify techniques and resources that can be used to successfully navigate university	Leverage techniques and resources to thrive during your time in university (and beyond!)

Required Readings: What Will I Need for This Course?

Course material will be available on **LEARN** (Waterloo's course management system) and on **Perusall** (an online platform for social reading, which allows you to highlight text and ask a question, leave a comment, or reply to others). We will use Perusall for all assigned readings, podcasts, and videos.

There are two required books for this course. **You must purchase electronic copies of these books through Perusall** (other copies will not work in Perusall).

- *The New Science of Learning, 3rd edition* by Todd D. Zakrajsek (\$40 to buy, \$20 to rent)
- *Thinking 101* by Woo-kyoung Ahn (\$13 to buy)

Assessment: How Will My Work Be Graded?

You will be assessed on a variety of activities. Detailed assignment instructions will be posted on LEARN.

Assignment/Activity	Weight	Due Dates
Assigned readings on Perusall	30%	Mondays & Wednesdays at 10pm
Course engagement	15%	Throughout the term
Exam #1 (in-class)	10%	Thursday, Oct 10 (2:30-3:50pm)
Exam #2 (in-class)	15%	Tuesday, Nov 26 (2:30-3:50pm)
Learning portfolio		
<ul style="list-style-type: none"> • Weekly entries (choose 10) 	10%	Due Fridays at 10pm
<ul style="list-style-type: none"> • Final portfolio & reflection 	20%	Due Friday, December 6 at 10pm

Course Format: What Can I Expect?

What You Can Expect from Me

My method of teaching (or “pedagogy”) aims to help students to think critically, develop valuable skills, and take an active role in their education. I ask for your help in creating a collaborative learning community where we support and challenge one another. Each of us has different knowledge, skills, and experiences that we bring to the table, and drawing on our collective knowledge will benefit everyone. This course is designed to emphasize active learning strategies, which involves experimenting with new techniques and sharing your perspectives with others. This may be a bit different than what you are used to, but the TAs and I are here to support you! If you'd like to more about this approach to teaching, you can look up “critical pedagogy” or “engaged pedagogy”.

What We Should Expect From Each Other

To maximize your learning, it is important that you engage with the course content, with each other, and with the instructor and TAs. Thus, course engagement is a substantial component of the course.

- You will get to choose some of your engagement activities, depending on what interests you the most. The goal of these activities is to contribute to a supportive and collaborative learning environment.
- The TAs and I are committed to creating a positive learning environment where diverse perspectives are recognized and valued as a source of strength. Let's work together to create a classroom culture based

on open communication, mutual respect, and inclusion. Disagreements and dissenting views are welcome – and encouraged – but personal attacks and oppressive discourse will not be tolerated.

- I strive to ensure an open and welcoming classroom for all students. If I ever miss the mark, or if you have other suggestions for enhancing our learning community, please don't hesitate to talk with me or one of the course TAs. We are all learning together.

Communication with the Course Instructor and Teaching Assistant

There are multiple ways to communicate with me (and the course TAs).

- You can **post questions in the LEARN Discussion Forum** entitled “Course Q&A for the Instructor and TAs.” Anonymous posts are allowed. If you think your question might apply to other students (e.g., if it's about assignment guidelines or course policies), this is the best platform to use so that other students can see the question and response(s). You're also welcome to respond to other students' questions!
- You can speak with me during the **student drop-in hours** (“office hours”) on Tuesdays and Thursdays, 4:00-4:45pm. If that time doesn't work for you, you can book an appointment with me via email.
- **You can also [email me](#) or one of the TAs directly.** UW policy requires that students and instructors use official UW email addresses for all email communications, so **be sure to email us from your UW account.**
- Please note that I am usually offline after 5pm and on weekends. My inbox can get quite full, so if you don't hear back from me within two business days, feel free to send a follow up email – I appreciate friendly reminders! **I also recommend including ‘120’ in the subject line so I don't overlook your email.**

Required Assignments: What Will I Need to Do?

Perusall Reading Assignments

INTEG 120 uses a “flipped classroom” model, where students prepare for class by completing assigned readings (or podcasts/videos) on Perusall, and then participate in active learning activities during class sessions.

- Completing a Perusall assignment involves doing the reading (or listening to the podcast/video) and annotating it by the due date listed on Perusall and LEARN.
- To annotate, you simply highlight text and add comments or questions, or reply to others.

Anyone should be able to get a high mark on the Perusall assignments with enough time and effort!

Course Engagement

Active engagement is a crucial part of this course and is important for creating a collaborative learning community where we can all learn from one another. A portion of your course grade will be based on engagement with course material and your peers. Course engagement has two main components:

- **Attendance:** You are expected to attend class on a regular basis. If you miss class for an excused reason – such as a documented illness or religious observance – it will not count against you *as long as you declare your absence on Quest* (see “Excused Absences & Academic Accommodations” below). You can also miss up to two class sessions for *any* reason without it negatively affecting your Course Engagement grade.
- **Engagement activities:** The second component of your Course Engagement grade will be based on contributions to LEARN Discussion Forums, whole class discussion, and collaborative class notes.

- At the end of the course, you will write a brief summary & reflection on how you contributed to the learning community and suggest a grade range that you think best reflects the work you did.

Exams

One of the learning objectives of this course is to implement evidence-based learning strategies to perform better on exams. You will have an opportunity to practice this with two relatively low-stakes exams.

- Note that exams must be taken in class, unless a student has a test-taking accommodation.
- If a student is late to an exam, they can still take it, but no additional time will be given.

Learning Portfolio

Throughout the course, you will complete several learning activities (e.g., creating a learning plan or doing a self-assessment), which you will pull together into a Learning Portfolio. This assignment has two components:

- *Weekly entries:* Choose 10 of your Portfolio entries to submit to LEARN for credit (each is worth 1% of your course grade). These will be graded pass/fail but must be submitted on time to be considered.
- *Learning portfolio reflection:* At the end of the term, you will curate a portion of your portfolio entries and reflect on your development as a learner. This will be graded by the instructor (out of 100%).

Academic Accommodation: Absences, Late Assignments, and Missing Exams

Excused Absences & Academic Accommodations

There are four types of absences that are *excused* and entitle students to academic considerations.

- *Self-declared absence:* Students can [self-declare one 48-hour absence](#) for any reason [via Quest](#).
- *COVID-related absences:* students can self-declare up to one COVID absence per term [via Quest](#).
- *Other absences:* For illnesses other than COVID, or for other documented circumstances (e.g., funerals), students should submit documentation to absence.uwaterloo.ca. (These will be approved or denied on a case-by-case basis.) *Please do NOT submit documentation to the instructor.*
- *Religious absences:* students can request religious absence accommodations [via Quest](#). If a student will miss an assignment due date or exam due to a religious observance, they must submit their accommodation request at least two weeks in advance of the due date.

If your ability to complete components of the course are affected by short-term extenuating circumstances, you must contact the instructor. See the [Academic Regulations](#) section of the Undergraduate Calendar for details.

Missing an Exam

Policies for missing exams depend on whether a student's absence was excused or unexcused (see above).

- If a student misses an exam due to an *excused* absence, they will either be offered a make-up exam or given an alternative assignment, at the discretion of the instructor.
- If a student misses an exam due to an *unexcused* absence, they will earn a 0 on half of that component and have the other half reweighted to the other exam (i.e., you can earn up to half of your grade back). For example, if a student misses Exam #1 – worth 10% of the course grade – they will earn a 0 for 5% of their course grade and have the other 5% reweighted to Exam #2 (making it worth 20% instead of 15%).
 - If a student misses *both* exams due to unexcused absences, they will receive a 0 on both exams.

Late Assignments

- *Perusall assignments*: students can earn partial credit if they complete the assignment late, *but only if they start the assignment by the original deadline*. The late window will stay open for one week. Credit declines linearly, so you will earn more credit the sooner you complete the reading.
- *Final Portfolio & Reflection*: The final learning portfolio is due December 6 at 10pm. Late submissions *will* be accepted until December 10, but there will be a 2.5% deduction for each day or part of a day it is late.
- All course assignments must be in no later than Tuesday, December 10, to receive credit.

University Policies

Generative AI

Generative artificial intelligence (GenAI) trained using large language models to produce text or images, such as ChatGPT, may be used to a limited extent for the learning portfolio, as long as students include proper citation and documentation. **GenAI is *not* allowed for Perusall assignments or on exams.** Permitted uses of and expectations for using GenAI will be outlined in assignment instructions. Recommendations for how to cite GenAI may be found through the library: https://subjectguides.uwaterloo.ca/chatgpt_generative_ai.

- Be aware that generative AI is known to falsify references to other work and may fabricate facts and inaccurately express ideas. GenAI generates content based on the input of other human authors and may therefore contain inaccuracies or reflect biases.
- You should also be aware that the legal/copyright status of GenAI inputs and outputs is unclear. Exercise caution when using large portions of content from AI sources, especially images. More information is available from the Copyright Advisory Committee: <https://uwaterloo.ca/copyright-at-waterloo/teaching/generative-artificial-intelligence>
- You are accountable for the content and accuracy of all work you submit in this class, including any supported by GenAI. *If GenAI plagiarizes and you use that output, then you will have plagiarized.*

Intellectual Property

This course contains the intellectual property of the instructor, TA, and the University of Waterloo. Intellectual Property, or 'IP', includes items such as lecture content, both spoken and written (including audio/video recordings), lecture notes, and other course materials the course.

- [Sharing IP without the owner's explicit permission is a violation of IP rights.](#)
- For this reason, ***you must receive permission from the instructor (via email) before recording any lecture content*** or sharing course materials with anyone not enrolled in the course.

Respectful Behavior

Policy 33, Ethical Behavior, addresses expectations for all members of the university. Policy 33 states that "each member of the University endeavor to contribute to the existence of a just and supportive community based on equality and respect for individual differences." Disrespectful or offensive behavior will not be tolerated.

- For more information about what constitutes discrimination, harassment, or a poisoned environment, see [Policy 33, Ethical Behavior](#). Furthermore, Policy 71, Student Discipline, covers academic *and* non-

academic offenses, such as disrupting other students' learning. In particular, Policy 71 prohibits "disruptive, dangerous, aggressive or threatening behavior, including by electronic means."

- **The instructor and TAs are committed to creating a safe, respectful, and supportive learning environment.** If you have been the target of hostile or disrespectful behavior, or you think you have witnessed another student engaging in such behavior towards others in class, please email me.

Academic Integrity

In order to maintain a culture of academic integrity, members of the UWaterloo community are expected to promote honesty, trust, fairness, respect and responsibility. (See [the Office of Academic Integrity website](#).)

- **Turnitin.com:** Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. If you do not wish to have your work uploaded to Turnitin, you must email the instructor at least one week before the due date to arrange an alternative (this may include a brief in-person exam with the instructor).

Discipline

A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. (Check [the Office of Academic Integrity website](#) for more information.) A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check the [Guidelines for the Assessment of Penalties](#).

- **NOTE from the instructor:** *Students who plagiarize or cheat on an assignment will typically receive a 0 on that assignment plus 5 marks off the final course grade; they will also be placed on probation. Students who impersonate others, distribute confidential academic materials, or use such materials will typically receive a 0 on the assignment, as well as suspension. Penalties become more severe after the first offence and can lead to expulsion.*

Grievance

A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#) for details. When in doubt, contact the Undergraduate Advisor for further assistance.

Appeals

A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes they have grounds for an appeal should refer to [Policy 72, Student Appeals](#).

University Resources: What Supports are Available to Help Me Succeed?

The University of Waterloo provides several resources and support services to help students achieve the academic success they are truly capable of. Most students access some of these services at some point in their

degree. I **strongly encourage you to make use of any services that might be beneficial to you**. I have provided a list of UW's support offices below and on LEARN (click on "Content" and scroll to the bottom).

Mental health issues & Counseling Services

The University of Waterloo, the Faculty of Environment, and the Department of Knowledge Integration consider students' well-being to be extremely important. We recognize that students may face health challenges – physical and/or emotional. **Please note that help is available.** Mental health is a serious issue for everyone and can affect your ability to do your best work. [Counselling Services](#) is an inclusive, non-judgmental, and confidential space. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and more.

- **NOTE from the course instructor:** I encourage you to check out [the wellness programs offered by Counselling Services](#), on stress management, depression, etc. Most programs are free. (I took some of these when UW offered workshops for faculty, and I found them to be incredibly helpful.)

AccessAbility Services

[AccessAbility Services](#), located in Needles Hall Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the Accessibility Services at the beginning of each academic term.

- **NOTE from the course instructor:** AccessAbility Services can offer support for a variety of disabilities such as ADHD, chronic pain, etc. If you think you might benefit from accommodations, even for temporary issues, I *strongly* encourage you to contact Accessibility Services ASAP.

Academic Support Services

- The [Writing and Communication Centre](#) (WCC) at UW offers writing workshops, online resources, and virtual appointments to assist students with all aspects of the writing process.
- UW's [Student Success Office](#) (SSO) has created several resources to help students develop good learning strategies, such as time management, note-taking, and reading critically.

Land Acknowledgement: On What Traditional Territory is This Course Located?

This course is being taught on the traditional territory of the Neutral, Anishinaabeg, and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand tract, which includes 10km of land on each side of the Grand River. This land was promised to the Six Nations of the Grand River in 1784, but today the Six Nations have *less than 5%* of this land. To learn more, see: [The Haldimand Tract and Land Back](#).

- If you would like to know more about the particular Indigenous peoples on whose land many of us live, work, and study, see: <http://www.lspirg.org/knowtheland>.
- For information about steps that UW is taking related to Indigenization, see <https://uwaterloo.ca/faculty-association/information-faculty/faculty-guide-working-waterloo/indigenization-waterloo>.

Schedule of Course Topics, Readings, & Assignments (Subject to Change)

Readings & annotations must be **completed** by 11:59pm the night before class. See Perusall for official due dates.

Week 1: Introduction & Course Overview

- No reading assignment – course introduction

Week 2: Discovering Yourself as a Learner

- Read *New Science of Learning*, “Introduction: How to learn in harmony with your brain”
- Read *New Science of Learning*, “Developing your learning strategy”

Week 3: Cognitive Biases

- Read *Thinking 101*, “The allure of fluency”
- Listen to the *Hidden Brain Podcast*, “How your beliefs shape reality”

Week 4: Enhancing Your Learning

- Read *New Science of Learning*, “Learning from multiple perspectives”
- Read *New Science of Learning*, “Managing cognitive load & improving memory”
- Listen to the *Ologies Podcast*, “ADHD neuropsychology”

Week 5: Neurodivergence and how it affects learning

- Listen to the *Ologies Podcast*, “ADHD neuropsychology, Part 1”
- Listen to the *Ologies Podcast*, “ADHD neuropsychology, Part 2”

Week 6: Preparing for Exams

- Read *The Upside of Stress*
- No reading – work on study sheet for Exam #1

Exam #1

(READING WEEK BREAK)

Week 7: Mindsets & attributions

- Read *New Science of Learning*, “Exploring social influences: Fixed & growth mindsets”
- Read *Thinking 101*, “The challenge of causal attribution”

Week 8: Leveraging our brains & thriving in university

- Read *New Science of Learning*, “Finding and using patterns”
- Read *New Science of Learning*, “Thriving in higher education”

Week 9: Common learning pitfalls

- Read *Thinking 101*, “Negativity bias”
- Reading *New Science of Learning*, “Avoiding Learning Pitfalls”

Week 10: How physical health enhances cognitive function

- Read *New Science of Learning*, “Sleeping to Enhance Learning” & “Exercising to Enhance Learning”
- Read *Thinking 101*, “Biased Interpretation”

Week 11: Learning in teams

- Read *New Science of Learning*, “Being an effective group leader/member”
- Read, “What Google learned from its quest to build the perfect team”

Week 12: Exam & Course wrap-up

- No reading – work on study sheet for Exam #2
- Read *Thinking 101*, “The trouble with delayed gratification”

Exam #2

