SYLLABUS FOR ECOR3800  
FALL 2022  
ECOR3800A AND ECOR3800B

Dr. Elisabeth Gilmore (she/her/hers)  
Associate Professor  
Civil and Environmental Engineering  
School of Public Policy and Administration  
Email: elisabeth.gilmore@carleton.ca

Lab website: https://carleton.ca/gilmore-policy-technology-climate/cu-home/homepage/

Section A: Wednesday and Friday from 11:35 AM - 12:55 PM, Azrieli Theatre Room: 101

Section B: Tuesday and Thursday from 11:35 AM - 12:55 PM, Azrieli Theatre Room: 101

Please attend your section only to manage the number of people in the room.

Office hours: Office hours for Professor Gilmore are by request and will generally be held by zoom. Information about availability and how to sign up are on Brightspace.

WELCOME TO ECOR3800: ENGINEERING ECONOMICS!

Engineering economics is the study of how to use economic and quantitative analysis to select between alternative, technical feasible solutions within a set of moral, social, environmental, and political criteria. It also involves understanding the applicability and limits of these techniques and approaches as well as the consideration of the complexity and uncertainty in the real world.

In this course, we will place equal emphasis on learning the quantitative methods, the use and applicability of these methods to select between alternative solutions, and the way that these methods are used (and sometimes misused) in a real-world context. The second goal will be achieved primarily through in semester long case study looking at light rail transport (LRT) projects, based on the experiences in Ottawa.

COURSE OBJECTIVES

By the end of the course, you will be able to:

- Develop cash flow engineering-economic models of costs and benefits of projects
- Compare the costs and benefits of alternative and mutually exclusive projects using time value of money approaches, including present worth, annual worth, payback period, and Internal Rate of Return (IRR)
- Assess the effect of inflation and taxation on costs and benefits of projects,
- Develop a project management schedule to ensure project completion
- Account for uncertainty and risk using sensitivity analysis
- Identify and assess economic and non-economic factors which may affect the decision-making process
The first three learning objectives will be primarily evaluated on a multiple-choice mid-term test. The second three objectives will be primarily evaluated through a team project based on the Ottawa LRT. The final project also evaluates the ability to present this material in a professional manner. All these objectives will be evaluated on the final exam. Self-assessments are available each week for you to independent track your progress on all objectives.

TEXTBOOK

It is highly recommended, although not mandatory, that students have a copy of the course textbook titled: “Engineering Economics: Financial Decision Making for Engineers” 7th edition by Fraser, Jewkes, Pirnia, and Schmitt. The material for this course is heavily adopted from that textbook including the course’s lecture slides.

Additionally, the Pearson MyLab that accompanies this textbook is highly recommended. This will give you access to a wide range of professionally developed test banks and other tools to further support your learning.

COURSE DELIVERY

1. Each week, the core lectures are delivered through videos posted on Brightspace. Videos and the self-assessment quiz are made available the week before the topic is on the syllabus. It is expected that you have watched the videos prior to your Tuesday/Wednesday lecture slot that is covering that topic.

   o The weekly self-assessment evaluation is associated with each set of lecture slides. It is your tool to help you evaluate your level of understanding.
   o You can take these quizzes as many times as you want and until you get a 100%.
   o You may complete the quizzes at any time (e.g. you are never late). Since you can always iterate until you get 100%, my recommendation is that you try them after viewing each week and then come back to them later as needed or to improve your grade.

2. In the Tuesday/Wednesday in person lecture slot, there will be brief review of the key concepts from the lecture video, an in-class seminar style activity related to the case study, and an opportunity to ask questions. The lecture will be recorded and posted on Brightspace along with my complete notes/slides and at times, an opportunity to try out the class activity. However, you cannot participate remotely.

3. In the Thursday/Friday in person lecture slot, the instructor and teaching assistants are available to provide an additional review of basic concepts. This session is in person, although there may be additional zoom opportunities depending on course needs.

4. For some weeks, there will also be guest lecturers. The guest lecturers will generally participate remotely. You may also join remotely on these days or participate in class. Guest lecturers may only be in person for one of the two sections. In this case, the other section will have the opportunity to participate remotely or review the lecture video.

Note that Carleton instructors, staff and students will be required to log in to their MyCarletonOne (MCI) accounts to access Zoom meetings as of Aug. 29.
COURSE WORK AND ASSIGNMENTS

The assessment for this course consists of four elements.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Timing/Dates</th>
<th>Description</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-evaluation assessments (10)</td>
<td>· Each lecture is associated with a self-evaluation.</td>
<td>· Opportunity to self-evaluate your skills until you get 100%.</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>· These assessments are made available to accompany the online lectures.</td>
<td>· These are automated assessments.</td>
<td></td>
</tr>
<tr>
<td>Midterm (1)</td>
<td>· There is one online test during class time on Oct 20 (Section B) and Oct 21 (Section A)</td>
<td>· The test is like the self-evaluations. It will be multiple choice and short numerical responses.</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· The test is timed to be 1 hour in length.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>· You will have the entire class period to work on the test.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>· You will take the test in the classroom on your computer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>There is no proctoring software.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>· There will also be a paper copy available in the room, if there any technical problems.</td>
<td></td>
</tr>
<tr>
<td>Final Exam</td>
<td>· The final exam will be scheduled by the university.</td>
<td>· The mode of delivery will be decided by the university.</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· The final will consist of a balance of multiple choice, short answer, and long-form questions.</td>
<td></td>
</tr>
<tr>
<td>Case Study</td>
<td>· Final Report due on December 5th</td>
<td>· In teams of 5, you will fulfill a request for proposals on a new LRT project</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· The final product is a written report submitted as a team.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>· There will also be a peer evaluation.</td>
<td></td>
</tr>
</tbody>
</table>

Details on the case study are provided separately and will be reviewed in more detail after the fall break. Teams will be assigned randomly by the teaching assistants. Please do not ask them to change the group assignments. If there are any issues with the team assignments, please bring them to my attention.

Important: Please note that a minimum of 30% is required on the final to pass this course.
# SYLLABUS (Subject to change)

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
<th>Textbook</th>
<th>Assignments/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Sept 8 – 9</td>
<td>Course Overview</td>
<td>Ch 1</td>
<td>Read the syllabus and take the test to unlock your course/Introduce yourself and set your course goals</td>
</tr>
<tr>
<td></td>
<td>Note: no lecture on Sept 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#2</td>
<td>Sept 13 – 16</td>
<td>Time Value of Money</td>
<td>Ch 2</td>
<td>Self-Assessment Quiz</td>
</tr>
<tr>
<td>#3</td>
<td>Sept 20 – 23</td>
<td>Cashflow Analysis</td>
<td>Ch 3</td>
<td>Self-Assessment Quiz</td>
</tr>
<tr>
<td>#4</td>
<td>Sept 27 – 30</td>
<td>Comparison Methods</td>
<td>Ch 4</td>
<td>Self-Assessment Quiz First Instructor Feedback</td>
</tr>
<tr>
<td>#5</td>
<td>Oct 4 – 7</td>
<td>Comparison Methods</td>
<td>Ch 5</td>
<td>Self-Assessment Quiz</td>
</tr>
<tr>
<td>#6</td>
<td>Oct 11 - 14</td>
<td>Taxation and Inflation</td>
<td>Ch 8/9</td>
<td>Self-Assessment Quiz</td>
</tr>
<tr>
<td>#7</td>
<td>Oct 18 – 21</td>
<td>Online Midterm</td>
<td></td>
<td>Test will be on Oct 20/21/Second Instructor Feedback</td>
</tr>
<tr>
<td>#8</td>
<td>Oct 24 – 28</td>
<td>Fall Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#9</td>
<td>Nov 1 – 4</td>
<td>Public Sector Decisions</td>
<td>Ch 10</td>
<td>Self-Assessment Quiz</td>
</tr>
<tr>
<td>#10</td>
<td>Nov 8 - 11</td>
<td>Project Management I</td>
<td>Ch 11</td>
<td>Self-Assessment Quiz</td>
</tr>
<tr>
<td>#11</td>
<td>Nov 15 – 18</td>
<td>Project Management II</td>
<td>Ch 11</td>
<td>No quiz/Extra time for work on Group Assignment</td>
</tr>
<tr>
<td></td>
<td>(Guest lectures)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#12</td>
<td>Nov 22 – 25</td>
<td>Sensitivity and Uncertainty Analysis</td>
<td>Ch 13</td>
<td>Self-Assessment Quiz</td>
</tr>
<tr>
<td>#13</td>
<td>Nov 29 – Dec 2</td>
<td>Review of Course Concepts</td>
<td></td>
<td>No quiz/Extra time for work on Group Assignment</td>
</tr>
<tr>
<td>#14</td>
<td>Dec 6 – 9</td>
<td>Final Case Study Discussions</td>
<td></td>
<td>Quizzes available to prepare for final exam</td>
</tr>
</tbody>
</table>
COURSE COMMUNICATION

I use the announcement function in Brightspace to send out weekly updates with important information related to the course. Using the announcement function is helpful because it keeps all communication from me about this course in one place instead of searching through your email every time you need to find a previous communication.

I also have an “ask the instructor” forum in Brightspace in which you can post your questions about weekly course content and wording of assignment questions. **Course questions will not be answered by email.** This is done for 2 reasons (i) Out of fairness so that all students can have access to the same answers provided to other students and (ii) efficiency, instructors often get the same questions and instructors are not always available to answer emails right away. Having the forum allows instructors to put the answer to questions there and reduce the wait time on your end and reduce the response time.

**When should I email the professor directly?** You should email if you are writing about a personal issue (e.g. illness, excused absence, want to discuss your course performance, would like to learn more about research opportunities in my lab, or talk about other academic matters, including reference letters). Please allow for a 24 hour turn around.

MY TEACHING GOALS FOR THIS SEMESTER

My primary goal is to create a high-impact, inclusive, and healthy learning environment with you. I will achieve this goal by doing my best to be prepared, pro-active, and flexible throughout the semester as follows.

- I will strive to create a learning community in which we can all feel comfortable and supported to share our knowledge, experiences, and ideas. I want to hear from you, both in and out of class, about ways the class can enhance your learning.

- I will do my best to keep all materials and assignment expectations up to date and clear on Brightspace. I will also provide you feedback on your work as quickly as possible.

- I will always recognize we are teaching and learning in an extraordinary time. I imagine that you are excited to learn and contribute to communities AND also that you are likely exhausted and stressed. I encourage you to communicate with me, the teaching assistants, and your group members if you are not feeling well and can’t attend class.

- I will work to ensure that you do not miss any critical learning materials (e.g., content that would be on the mid-term or final) because of illness (or any other documented accommodation). I will use Brightspace to post all materials. I am not able to enable remote participation into the in-person classes. However, I will always record class sessions and post them along with extensive notes. We may also decide to hold an occasional class session on zoom for everyone as well.

- To facilitate a safe learning environment for all, I will always wear a mask in the classroom. I encourage to wear a mask as well. Please consider that your mask protects you and importantly, it also protects others.
ATTENDANCE POLICY AND ILLNESS

Attendance is not mandatory for this course. All lectures, including those that are held in person or by guest lecturers, will be recorded, and made available on the course website. Hence, whether you attend in person or not, your number of contact hours with the material will be the same.

Attending in person, however, gives you more opportunities to interact with your professor, learn from your classmates, access the teaching assistants, and engage with the material in deeper and more meaningful ways. Additionally, some sessions will be held on zoom to accommodate guest lecturers. You are expected to attend any zoom lectures these the way you would a regular in person lecture.

As we all continue to navigate ongoing disruptions caused by COVID-19 pandemic, I request that you do not attend class if you have any symptoms regardless of whether you believe it is covid or not. This protects you, your classmates, and the wider university community. To support this, we are continuing the self-declaration process for the fall term.

In place of a doctor’s note or medical certificate, complete the self-declaration form (https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf) available on the Registrar’s Office website to request academic accommodation for missed course work including exams and assignments. Fill out this form and then contact me directly to discuss required accommodations arising from the COVID-19 situation.

ACADEMIC ACCOMMODATIONS

Students with diverse learning styles and needs are welcome in this course. Additionally, you may need special arrangements to meet your academic obligations during the term. You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at http://www2.carleton.ca/equity/

For some common accommodation requests, the processes are as follows:

**Pregnancy, adoption, or other changes to your caregiving responsibilities:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://www2.carleton.ca/equity/

**Religious obligations:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://www2.carleton.ca/equity/

**Academic Accommodations for Students with Disabilities (Effective July 1, 2022):** The Paul Menton Centre for Students with Disabilities (PMC) provides academic accommodations and support services to students with Learning Disabilities (LD), mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision.
If you have a permanent, persistent/prolonged, or temporary disability requiring academic accommodations in my course, please contact the PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation.

If you are already registered with the PMC, please request your accommodations for this course through the Ventus Student Portal at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). Requests made within two weeks will be reviewed on a case-by-case basis. For final exams, the deadlines to request accommodations are published in the University’s Academic Calendars.

After requesting accommodations through the Ventus Student Portal, please meet with me to discuss your accommodation needs and how they will be implemented in my course.

**ACADEMIC INTEGRITY**

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensure that a degree from Carleton University is a strong signal of each student’s individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. Carleton University’s Policy on Academic Integrity ([http://www.carleton.ca/studentaffairs/academic-integrity](http://www.carleton.ca/studentaffairs/academic-integrity)) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. It is your responsibility to be familiar with these policies. Any students who do not act with academic integrity will face severe consequences including immediate referral to Associate Dean of Student Affairs. If you have any questions, please reach out to me or your teaching assistant. We can help you avoid many common issues.

**I will support you in achieving your learning goals and you do not need to compromise your academic integrity to succeed!** Students who are under stress may be more likely to resort to cheating or plagiarism. Feelings of anxiety, depression or stress can occur to any one at any time and are not reflection on your overall character or your ability to cope and ultimately thrive. If you have any concerns about your performance in this class or in your studies, please reach out or take any of the steps below to get the help you need to succeed. You do not need to compromise your academic or personal integrity.

**STUDENT MENTAL HEALTH AND WELLNESS**

Social isolation, online learning, career uncertainty, health concerns and both academic and non-academic stresses can combine to create adverse mental health effects. These mental health effects, including feelings of anxiety, depression, and stress, are valid. I strongly advise you to reach out and seek help and guidance when you feel it is necessary.

There are many resources available to provide you with support and guidance through turbulent times, yet if you feel like you need to speak about it with me to guide you towards one of these resources, then please reach out!
ALGONQUIN TERRITORY ACKNOWLEDGMENT

Carleton University acknowledges the location of its campus on the traditional, unceded territories of the Algonquin nation. In doing so, Carleton acknowledges it has a responsibility to the Algonquin people and a responsibility to adhere to Algonquin cultural protocols.

Territory acknowledgements demonstrate respect for the traditional custodians of a particular region or area. The practice serves to remind people who are not Indigenous that they are guests in these territories, and that these territories had complex and culturally specific legal, governance, education, and justice systems prior to the creation of Canada and continue to in the present day. It serves to reframe relationships between Indigenous and non-Indigenous peoples in a way that acknowledges Indigenous Peoples have inherent rights to their territories. More information and resources are available here: https://carleton.ca/indigenous/policies-procedures/algonquin-territory-acknowledgment/

COMMITMENT TO EQUITY, DIVERSITY, AND INCLUSION

I believe that an intellectual community is enriched and enhanced by diversity along several dimensions, including race, ethnicity and national origins, gender and gender identity, sexuality, class, and religion, and including Indigenous Peoples. I am especially committed to increasing the representation of those populations that have been historically excluded from participation in higher education.

If at any time, you perceive that you, another member of this class, or a group or groups in this class could be facilitated in or is being prevented from fully participating in this course, please bring this to my attention or to the attention of a teaching assistant. We will work together to address any issues.