Introduction to Principles of Microeconomics and Financial Project Evaluation

FALL 2018 COURSE OUTLINE

Instructor
Christopher Willmore (willmore@uvic.ca) [吴莫]

Lectures
11:30 – 12:20 TWF, ECS 125

Office Hours
2:30 - 4:20 Tuesdays, BEC 390

Course Site
https://coursespaces.uvic.ca/

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University Policy on Inclusivity and Diversity

The University of Victoria is committed to promoting, providing and protecting a positive, supportive and safe learning and working environment for all its members.

Instructor addendum: While I expect most of you will treat your peers with the traditional BC kindness and respect, I’d like to take a moment to remind you all in writing that this course and its associated web site and meeting space are intended to be a safe and comfortable place for everyone to learn in. Systematic disrespect or other ill treatment of a person or group of people will not be tolerated.

Course objectives

“Why do engineers need to learn economics?

Well the first obvious reason, because you want to graduate. ... But, as a practicing bridge engineer, I can tell you that the ability to use money wisely is a skill sorely needed in the field.”

-Stuart Nielsen

The purpose of this course is to teach you skills and alternate ways of looking at the world that will help you in your careers as engineers. Just as you’ve been taught to analyze the structure, stresses and composition of physical constructs, ECON 180 will teach you to do the same for the inevitable economic aspects of your projects.

By the end of the course, you should be able to spot structural weaknesses in the financial fabric of your task and be able to strengthen those spots through selection of the most appropriate economic measures. In addition, you will be able to compare vastly different projects and decide, in a rigorous fashion, which are most worth pursuing.

Essential Course Rules

- “Be excellent to each other.” –Bill & Ted
- Give credit where credit is due
- Give all course components an honest try
- Don’t keep concerns bottled up
- Ask for help if you need it
University Policy on Accessibility

Are you a student with a learning disability, ADHD, mental health issue or long-term recurring physical or sensory disability? Do you have chronic health issues? If you do, and you need support with accessing your courses, or need academic accommodations to address barriers to your education, you need to register with the Resource Centre for Students with a Disability (RCSD). After you register, the RCSD office will work with you, your instructors and others to create learning environments that are equitable, inclusive and usable.

Instructor addendum: I’ve had to deal with a number of disabilities myself. If you are a student who needs this sort of accommodation, don’t hesitate to contact me personally. Once you do, I’ll work with you one-on-one and do my best to come up with a custom plan that will hopefully let you get the most benefit possible from this course.

Regarding Punctuality and Courtesy

University Policy on Attendance

Students are expected to attend all classes in which they are enrolled (University Policy). Students who do not attend classes must not assume that they have been dropped from a course by a department or an instructor. Courses that are not formally dropped will be given a failing grade, students may be required to withdraw, and will be required to pay the tuition fee for the course.

An instructor may refuse a student admission to a lecture or laboratory because of lateness, misconduct, inattention or failure to meet the responsibilities of the course. Students who neglect their academic work, including assignments, may be refused permission to write the final examination in a course.

Instructors must inform students at the beginning of term, in writing, of the minimum attendance required at lectures and in laboratories in order to qualify to write examinations.

Students who are absent because of illness, an accident or family affliction should report to their instructors upon their return to classes.

Lectures

Lectures officially begin at 11:30. As a courtesy to other students and the instructor, students are asked to stay quietly in their seats until 12:20 or an explicit ‘class dismissed!’.

While you are strongly encouraged and expected to attend all lectures in person, it is not a requirement for sitting the final exam.
What if I’m late to class?

Everyone’s had days where despite their best intentions, they can’t make it to class on time, but don’t wish to miss the lecture entirely. In these cases, please use common sense and politeness to quietly make your way to a seat with as little disruption to others as possible.

What if I miss a class?

If you miss a lecture, you may download the lecture notes on the course web site.

Electronic Devices

Use common sense. In general, I have no problem with the use of electronic devices during the lecture as long as it does not disturb other students. If a student complains about a peer’s use of a device, the device must be turned off immediately.

I’m open to allowing students to record portions of the entirety of the lecture as audio, video, or both for personal use, but please ask and obtain my explicit permission before doing so. You are NOT allowed to post course materials or lecture recordings to social media or the wider web. If you feel you absolutely must do so, please see me (the instructor) in person first to obtain permission.

The gist: If YOU wouldn’t be comfortable with someone else doing it to you (stealth-recording a video of you and uploading it to YouTube, taking your unedited class notes and putting them on the web with your name on them, texting loudly while sitting next to you in class) then you should probably ask before doing it, if only for the sake of politeness.

The use of any and electronic devices other than a non-programmable, non-communicating calculator is forbidden during quizzes and the final exam. Exceptions will only be made for documented reasons of accessibility, as detailed in the university policy on accessibility.

Midterms and the Final

The final exam will take place during the usual December exam period. Midterms take place in class. They start promptly at 11:30 and end at 12:20. Students should have their student cards out for inspection.

While the each midterm will focus on the topics covered since the last one, familiarity with all previous course material is assumed. The final is cumulative.
What if I’m late to a midterm or the final?

If you are late, please make your way quietly to the instructor to be handed a copy of the test. You will then have to write the test in the remaining scheduled time. Unfortunately, due to room bookings and the fact that the answer key is posted immediately after the quiz, it is not possible to extend the allowed time.

What if I miss a midterm or the final?

Students with valid excuses who miss a midterm will be accommodated, either by being excused from a midterm, or being allowed to write it early. Students who miss a midterm without a valid excuse will receive a mark of zero. Students who miss the final exam must follow standard UVic policy on such matters, which may involve submitting a Request for Academic Concession.

University Policy on Travel and the Final Exam

Students are advised not to make work or travel plans until after the examination timetable has been finalized. Students who wish to finalize their travel plans at an earlier date should book flights that depart after the end of the examination period. There will be no special accommodation if travel plans conflict with the examination.

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<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
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<td>65-69</td>
<td>60-64</td>
<td>50-59</td>
<td>0-49</td>
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The table on page 7 shows quiz dates, assignment due date and lecture coverage for the course. If a textbook chapter is not listed for a topic, supplemental readings will be provided on the course web site.

**Test Coverage**

Intended quiz and assignment coverage as of the start of the course is listed below. This may change as the course progresses.

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Expectations

The required readings, live lectures, assignments and posted lecture notes are explicitly designed as complements, not substitutes. Students are expected to engage with all components of the course in a timely manner. **Neglecting any one of these aspects has historically led to significantly lower marks for ECON 180 students.**

Basic knowledge of calculus and algebra is a pre-requisite for ECON 180, and this pre-requisite is taken seriously. The course assumes that students are familiar with derivatives, power functions and solving systems of equations (N equations, N unknowns). One of the course textbooks (Stand-Up Microeconomics) includes a ‘boot camp’ for students who may need a refresher, or who are unfamiliar with the concept of partial derivatives.

As an ECON 180 student, you are expected to:

- **Attend all lectures.**
- **Complete all required reading**, including the lecture notes, within a week of the relevant lecture.
- By the date of the relevant test, **understand all required reading** in such a way that you would be able to explain the basic concepts to an intelligent high schooler, without using math.
- **Understand the basic principles and intuition behind course concepts.** This is orders of magnitude more important than being able to get the algebra exactly right. (In this course, memorizing equations and working your way back to basic concepts is generally a very bad idea.)
- **Work individually on assignments**, and complete at least one attempt within a week of the relevant lecture.
- **Complete optional readings** to obtain greater familiarity with the course material, if necessary (for example, if the required readings aren’t enough to clear up a concept).
- **Complete practice questions as needed** to gain familiarity with course concepts and material.
- **Ask questions in class and office hours** to clear up course material and concepts.
- **Ask the instructor for additional help** with course material and concepts, if the student encounters difficulties not cleared up via required and optional readings, practice problems or talking with fellow students.
- **Bring any constructive criticism and feedback to the instructor’s attention before the end of the course**, so that the course may be adjusted if necessary.
# PRELIMINARY LECTURE/TEST SCHEDULE, ECON 180, FALL 2018

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<th>Topic</th>
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<td>September</td>
<td>Apples and Oranges</td>
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<td>Decision Trees</td>
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<td>Monte Carlo Techniques</td>
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<td>32</td>
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<td>33</td>
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<td>Tax Incidence</td>
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Evaluation and Assessment

<table>
<thead>
<tr>
<th>Evaluation</th>
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<tr>
<td>Assignments</td>
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<tr>
<td>Midterms</td>
<td>15% each</td>
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<tr>
<td>Final Exam</td>
<td>40%</td>
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<tr>
<td>Highest of Midterm 1 or 2 Mark</td>
<td>5%</td>
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</table>

Assignments: 10%

Your assignment mark is the average mark across all assignments.

Assignments are in the form of lecture-specific Coursespaces quizzes that draw random multiple-choice questions from a test bank curated by the instructor. These assignments are open until nearly midnight on December 5th. You may re-attempt the assignments as many times as you wish, and the mark for each assignment is equal to your highest mark on any attempt. (Most students are expected to score very highly on their assignment mark.)

Why is it done this way? To allow you to work at your own pace, to reward reviewing material and studying for quizzes, and to (hopefully!) reduce the incentive to cheat. These online assignments have proved popular with past ECON 180 students, who found them very useful for learning the material. Please keep in mind assignment questions are generally on the easy side. You should think of them as a minimum standard of learning, and also use the relevant solved practice problems pointed out in each lecture for midterm and final review.

Midterms: 15% each, for a total of 45%, plus an extra 5% equal to your highest mark from the first two midterms. (Since Midterm 3 is in the last two weeks of class, it can’t be worth more than 15% of your mark.)

Most questions will be short-answer. That way, you can get partial credit for partially correct answers. Seeing your work also gives me a better idea of how students are doing in the course, what concepts need reinforcing in class, and so on.

Formula sheets will be included as part of each printed midterm. Sample copies of the formula sheet will be made available to students in advance of the midterm, to help with studying. Be sure to check the ‘formula sheet formulas’ slide at the start of each set of lecture notes that introduces a formula that will be on the sheet.

Why so many midterms? There’s a LOT of content in this course. Testing is broken up into three midterms so students only have to study a reasonable amount for each one, and so that I can actually test all the relevant concepts in the 50 minutes allotted. It’s important to me that students have enough time to answer midterm questions properly.
Final Exam: 40%

The exam is cumulative and consists of questions similar to those on the midterms and assignments. It is not necessary to pass the exam in order to pass the course.

A formula sheet will be included as part of the final exam. Sample copies of this formula sheet will be made available to students in advance of the exam, to help with studying.

Required Textbooks

There are three required textbooks for the course. Two of them are available for free, in electronic form. The third is on 2-hour reserve at McPherson Library.


- By Niall M. Fraser and Elizabeth M. Jewkes
- Other editions are not supported by the course. Page/problem references will not match, and some material may differ (especially in the 4th edition).
- Either an electronic (e.g. Kindle) or a print copy is fine. The instructor has also left a copy on 2-hour reserve at McPherson Library.
- FYI: The digital access card includes an online-only HTML version of the text, practice multiple choice quizzes, Excel files for textbook questions and additional solved problems.

**Stand-Up Economics: The Micro Textbook with Calculus**

- By Yoram Bauman
- Available for free at the author’s site:
- We will be using the version with calculus.

**Microeconomics, by Besanko and Braeutigam, 2nd edition**

- The publisher has made the first 8 chapters of this textbook available online for free:
  - [http://bcs.wiley.com/he-bcs/Books?action=index&bcsId=2164&itemId=0471457698](http://bcs.wiley.com/he-bcs/Books?action=index&bcsId=2164&itemId=0471457698)
- We will be using at least Chapters 2, 6, 7 and 8.
- Since this is an old textbook, used copies are available very cheaply (a few cents plus shipping, in many cases). A print copy is not required, but some students may find one useful.

Another useful, online-only ‘textbook’ is ‘Project Management for Construction’, by Chris Hendrickson, available at [http://pmbook.ce.cmu.edu/](http://pmbook.ce.cmu.edu/). Chapter 6 in particular provides a
whirlwind tour of most of the project evaluation methods we’ll look at throughout the course, and chapters 10 and 11 discuss some of the more challenging project management techniques (critical path, etc.) in detail.

**On Plagiarism and Academic Integrity**

**UVic Policy on Plagiarism**

A student commits plagiarism when he or she:

- submits the work of another person as original work
- gives inadequate attribution to an author or creator whose work is incorporated into the student's work, including failing to indicate clearly (through accepted practices within the discipline, such as footnotes, internal references and the crediting of all verbatim passages through indentations of longer passages or the use of quotation marks) the inclusion of another individual's work
- paraphrases material from a source without sufficient acknowledgement as described above

Students who are in doubt as to what constitutes plagiarism in a particular instance should consult their course instructor.

The University reserves the right to use plagiarism detection software programs to detect plagiarism in essays, term papers and other assignments.

(Source: [http://web.uvic.ca/calendar2011/FACS/UnIn/UARE/PoAcI.html](http://web.uvic.ca/calendar2011/FACS/UnIn/UARE/PoAcI.html))

All ECON 180 students are required to read and become familiar with the Policy on Academic Integrity detailed at the URL cited in the box above. A brief summary is at


A breach of academic integrity will result in a non-droppable mark of zero on the assignment, quiz or final exam in which it is detected. Additional penalties may also apply.

A second violation in the same category (assignment or quiz) will lead to a mark of zero on the entire category (total assignment mark or total quiz mark), in addition to any other penalties.

When taking quizzes or the final, use of unauthorized materials counts as a breach of academic integrity. Each assessment will require the student to agree to a
basic honor code. Violating this honor code will be considered a breach of academic integrity.

What about my classmates? Can I work with them on assignment questions?

To a degree, absolutely, but there are limits. All of you are here to learn, and as the instructor I’d like to avoid a situation where a small number of people do all the work and everyone else just ‘adapts’ it.

Engineering Economics is a practical discipline. You’re required to take this course because it provides skills that are crucial to your success as a practicing engineer. It’s essential that you learn to solve these problems on your own, so that you may apply what you’ve learned in your future career without having to constantly refer back to your old textbook.

This doesn’t mean that you can’t study together, or help each other out with assignments – it just means that such collaboration should stop short of something that would absolutely require citation, such as a direct quote or a duplicate, non-obvious solution method.

Good idea:

You: “Hey, Sam. I’m stuck on Question 6. I tried using the method in the lecture notes, but my answer’s too small and the sign is wrong.”

Sam: “Did you convert all the costs to annual values? I got the same mistake until I did that.”

You: (several minutes later) “You’re right! That fixed it. Thanks, Sam.”

Bad idea:

You: “Hey, Sam. I’m stuck on Question 6. I tried using the method in the lecture notes, but my answer’s too small and the sign is wrong.”

Sam: (hands over a paper) “Here, take a look at my answer. I had that mistake, too, but then I fixed it.”

You: (after going over Sam’s solution line by line, you cross out your old answer and write a new one using the same method) “Thanks, Sam. That worked. You can have your assignment back.”
UVic Statement on the Course Experience Survey

I value your feedback on this course. Towards the end of term you will have the opportunity to complete a confidential course experience survey (CES) regarding your learning experience.

The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey, you will receive an email inviting you to do so. If you do not receive an email invitation, you can go directly to http://ces.uvic.ca.

You will need to use your UVic NetLink ID to access the survey, which can be done on your laptop, tablet or mobile device. I will remind you nearer the time, but please be thinking about this important activity, especially the following three questions, during the course.

1. What strengths did your instructor demonstrate that helped you learn in this course?
2. Please provide specific suggestions as to how the instructor could have helped you learn more effectively.
3. Please provide specific suggestions as to how this course could be improved.

General Learning Objectives
(Specific objectives are listed at the start of each set of lecture notes.)

- Understand the relationship between time and value. This includes understanding discount/interest rates, opportunity cost, the minimum acceptable rate of return inflation and depreciation, and being able to adjust cash flows and project evaluation measures for their effects.
- Become proficient at converting rates from one time period to another (e.g. quarterly to daily), and be able to convert banks’ posted interest rates (e.g. APR) to effective, real interest rates.
- Become comfortable with discounted cash flow analysis, a way of reducing complicated streams of cash flows to more tractable present/future/annual values, and its standard notation.
- Evaluate and choose between independent and mutually exclusive projects using benefit-cost analysis, net present value, internal/external rates of return, annual worth, effective annual cost (for replacement decisions) and payback periods.
- Gain a basic understanding of the use and abuse of multipliers and job creation measures in reports.
- Gain a basic awareness of income statements, balance sheets, financial ratios and their implications.
- Understand how to use work breakdown structures, Gantt charts and the critical path method (CPM) in project planning. Be able to efficiently ‘crash’ a project using CPM.
- Gain a basic understanding of sensitivity analysis/graphs, break-even analysis, decision trees and Monte Carlo techniques (probabilisitic sensitivity analysis).
- Be able to adjust project evaluation measures for Canadian taxes, including the capital cost allowance, and gain a basic familiarity with Canadian taxes faced by engineering firms.
- Understand the basic economics behind supply and demand equilibrium and tax incidence.
How can I get help?

I’m stressed and overloaded!

I’m always happy to meet with students to talk about their concerns. ECON 180 is just a course – your health, including mental health, comes first. You may send me an e-mail at willmore@uvic.ca, see me during office hours or make a private appointment either by e-mail or by seeing me after class.

You don’t have to go through this alone. I’m here to help, and I care about making sure that your course experience is healthy and productive. If you contact me, I’ll listen carefully to what you have to say, and work with you to find a solution.

If you don’t feel comfortable talking to the instructor about your situation, that’s okay! The university has a number of resources available to help students who are stressed. You may find a list of them here: http://www.uvic.ca/mentalhealth/students/treatment-support/index.php

What if I can’t make it to your office hours?

During periods of high demand, I’ll hold evening and weekend online office hours via IRC (an anonymous, text-based protocol accessible via a number of free clients).

Lecture Material

- **Read the required readings**, and carefully go through the examples in them.
  - The ‘Review Problems’ at the end of each chapter are a summary of the chapter’s concepts in problem form. They’re an excellent diagnostic – if you have trouble with them, you’ll know exactly where in the text to look for clarification.
- **Try the relevant solved problems** for each lecture. These are listed in a slide at the start of each set of lecture notes, and are indexed by topic.
  - Try these FIRST, since you actually have long-form solutions for them (unlike the multiple-choice assignment questions)! The solutions for each textbook chapter’s questions will be posted on Coursespaces as they become relevant.
  - The index allows you to focus your practice on specific topics you have trouble with. I know engineering students are busy, and this index was designed to allow you to use your limited study time efficiently.
- **Read optional readings** cited in lecture notes.
- **Contact the instructor during Office Hours** (Online or Offline)
- **Talk to the instructor** after class
- **Try the assignment questions** for the relevant lecture. The first few times you try an assignment, you’ll probably see different questions. While they shouldn’t be your first choice for practice (due to the lack of full solutions), they do provide additional problems focused on specific lectures.
- **E-mail the instructor** (willmore@uvic.ca)
Assignments

- Try the **relevant solved problems** for each lecture. These are listed in a slide at the start of each set of lecture notes, and are indexed by topic.
  - The solutions for each textbook chapter’s questions will be posted on Coursespaces as they become relevant.
  - The index allows you to focus your practice on specific topics you have trouble with. I know engineering students are busy, and this index was designed to allow you to use your limited study time efficiently.
- **Read the required readings**, and carefully go through the examples in them.
  - The ‘Review Problems’ at the end of each chapter are a summary of the chapter’s concepts in problem form. They’re an excellent diagnostic – if you have trouble with them, you’ll know exactly where in the text to look for clarification.
- **E-mail the instructor** (willmore@uvic.ca). If the question makes no sense to you, or if you think there may be an error in the question, do **NOT** hesitate to e-mail me! **You should NOT be spending hours on an assignment question.**
  - If i) you’ve read the required readings (including lecture notes) and tried the relevant solved problems for the question’s specific topic, and ii) you’re still completely stuck after 20-30 minutes, or think there’s an error, please send me an e-mail.
- Contact the instructor during **Office Hours** (Online or Offline)
- **Talk to the instructor** after class
- **E-mail the instructor** (willmore@uvic.ca)

Midterms/Final

- **Read the required readings**, and carefully go through the examples in them.
  - The ‘Review Problems’ at the end of each chapter are a summary of the chapter’s concepts in problem form. They’re an excellent diagnostic – if you have trouble with them, you’ll know exactly where in the text to look for clarification.
- Try the **relevant solved problems** for each lecture. These are listed in a slide at the start of each set of lecture notes, and are indexed by topic.
  - **Try these FIRST**, since you actually have long-form solutions for them (unlike the multiple-choice assignment questions)! The solutions for each textbook chapter’s questions will be posted on Coursespaces as they become relevant.
  - The index allows you to focus your practice on specific topics you have trouble with. I know engineering students are busy, and this index was designed to allow you to use your limited study time efficiently.
- Contact the instructor during **Office Hours** (Online or Offline)
- If you’ve run out of relevant solved problems, try the **assignment questions** for each lecture.
- **E-mail the instructor** (willmore@uvic.ca)
- Review **previous quizzes and finals**, which will be posted on Coursespaces, in order to get a **sense of my question-writing style**. **Do NOT use these as a source of practice questions, and absolutely NOT as a main source!** The course changes a lot between sessions in response to student feedback, and evaluations from previous sessions are not necessarily very relevant to the present version. (There are dozens of relevant solved problems you should use, instead.)
- **Try to get a good night’s sleep** before each test! (It’s not always an option, I know, but in my experience this can tip the scales between doing poorly and doing very well.)