ENGINEERING
McMaster-Mohawk
Bachelor of Technology
Partnership

McMaster University

Course Outline

1. COURSE INFORMATION

Session Offered	Winter 2021	
Course Name	Engineering Economics (On-line)	
Course Code	GENTECH 3EE3	
Date(s) and Time(s) of lectures	Wednesday 6:30-9:30 PM	
Program Name	One of the following: Civil Engineering Infrastructure Technology / Software Engineering Technology / Energy Engineering Technologies / Manufacturing Engineering Technology	
Calendar Description	Costing methods of engineering designs and processes; minimum acceptable rate of return, return sensitivities, time value of money, internal rate of return, pay-back period, amortization of equipment and capital cost allowance structures.	
Instructor(s)	John D'Alessio	E-Mail: dalessi@mcmaster.ca Office Hours & Location: request for appointment

2. COURSE SPECIFICS

Course Description

Instruction Type

Code	Type	Hours per term
C	Classroom instruction	39
L	Laboratory, workshop or fieldwork	
T	Tutorial	
DE	Distance education	
	Total Hours	39

Resources

ISBN	Textbook Title & Edition	Author & Publisher
9780135728826 (required)	Engineering Economics, Financial Decision Making for Engineers, MyLab with 7Ce edition	Niall M. Fraser, Elizabeth M. Jewkes, and Mehrdad Pirnia. Published by Pearson Education Canada
9780133405538 (optional)	Engineering Economics, Financial Decision Making for Engineers, 6 th edition	Niall M. Fraser, Elizabeth M. Jewkes, and Mehrdad Pirnia. Published by Pearson Education Canada
9780199029280 (optional)	Engineering Economic Analysis 3rd Canadian Ed. (Loose-leaf version)	Newnan, Whittaker, Eschenbach, Lavelle (Oxford)
9780195447545 (optional)	Engineering Economic Analysis, 3rd Canadian Ed. (Hardcover)	Newnan, Whittaker, Eschenbach, Lavelle (Oxford)

Other Supplies	Source
Course Resources	Additional course resources will be available on (A2L)

Prerequisite(s)	Registration in Civil Engineering Infrastructure Technology, Computing and Information Technology, Energy Engineering Technologies or Manufacturing Engineering Technologies.
Corequisite(s)	N/A
Antirequisite(s)	GENTECH 1EE3, 2EE3
Course Specific Policies	It is expected that students review all posted resources on A2L for the week topic(s) under discussion prior to class. Students are expected to attend and actively participate during the live weekly synchronized lectures offering insight, comments, reinforcement, contrary views, and underscoring examples. You are required to participate and provide questions and/or concerns in the online asynchronized group case study activities and general forums, respectively. **Quizzes:** This course will have 5 online quizzes. The dates and times are announced on the Course Outline with specifics on A2L. The lowest quiz score will be excluded from the calculation of your final grade, leaving 4 quizzes worth 5% each (total of 20%). If you use an MSAF for one of the 5 quizzes, your final grade will be calculated as follows: • Each of the remaining 4 quizzes will be worth 4% each for a total of 16%. • The Midterm will be worth 30% (unchanged). • Your Final Exam will be worth 54%. **Midterm Exam:** The midterm will be a common exam written in-class scheduled in Week 6 on **Wednesday, February 16th, 7:00 – 9:00 PM (Online)**. The midterm exam format will include multiple-choice questions and application-focused problems covering course material from weeks 1-5. • Please note that there are no deferred mid-term examinations in this course. If, for any reason a student misses a mid-term examination, the value of that examination will be applied to the cumulative final examination **(i.e. a missed midterm exam will result in the cumulative final examination being weighted at 80% of the final grade)**. • MSAF is not permissible for weights on evaluations (i.e. midterm, final exam) that are greater than or equal to 25%. **Any attempt to submit a falsified MSAF for this course for a missed midterm exam constitutes academic dishonesty and charges may be filed with the Office of Academic Integrity.** **Final Exam:** The Final exam MUST be written online during the last scheduled online class. The Final exam format will include multiple-choice questions and application-focused problems.
Departmental Policies	Students must maintain a GPA of 3.5/12 to continue in the program. In order to achieve the required learning objectives, on average, B.Tech. students can expect to do at least 3 hours of “out-of-class” work for every scheduled hour in

	class. "Out-of-class" work includes reading, research, assignments and preparation for tests and examinations. Where group work is indicated in the course outline, such collaborative work is mandatory. The use of cell phones, iPods, laptops and other personal electronic devices are prohibited from the classroom during the class time, unless the instructor makes an explicit exception. Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class. Instructor has the right to submit work to software to identify plagiarism.

3. SUB TOPIC(S)		
Week 1	Engineering Economics and Decision Making, Time Value of Money, Interest Rates, and Cash Flow Diagrams	Chapters 1 & 2
Week 2	Compounding for Single Payments and Uniform Annuities	Chapter 3
Week 3	Uniform Annuities, Continuous Compounding, Mortgages and Loans, Bonds and Excel Functions, **Online Quiz 1**	Chapter 3
Week 4	Non-Uniform Annuities (Arithmetic and Geometric Gradients) and Perpetuities, Case Study 1 – Financial Planning, **Online Quiz 2**	Chapter 3
Week 5	Present Worth, Annual Worth, Payback Period and Midterm Exam Review	Chapter 4
Week 6	**Midterm –** Scheduled for Wednesday, Feb 16th, 7:00 - 9:00 PM (Online)	Chapters 1-4
Week 7	Mid-term Recess: Monday, February 21st to Sunday, February 27th	
Week 8	Analyses Rate of Return Analysis, IRR, ERR and Incremental Analysis, Case Study 2 – Break-Even Analysis, **Online Quiz 3**	Chapter 6
Week 9	Depreciation and Financial Accounting (Income Statements, Balance Sheets, and Financial Ratio Analysis)	Chapters 2 & 6
Week 10	Asset Replacement Decisions, Economic Life, Equivalent Annual Cost (EAC) of Capital, Operating and Maintenance, **Online Quiz 4**	Chapter 7
Week 11	Income versus Corporate Tax Rates, After-Tax Cash Flows, IRR Tax Calculations, Capital Cost Allowance, and Specific Tax Rules in Canada, Case Study 3 – After-Tax Cash Flow, **Online Quiz 5**	Chapter 8
Week 12	Inflation, Price Indices, Inflation Rates, Converting Between Real and Current Dollars, Project Evaluation Methods with Inflation Economic Analysis in the Public Sector and Benefit-Cost Ratios, Final Exam Review	Chapters 9 & 10
Week 13	Final Exam Review Tutorial	Chapters 1-10

ENGINEERING
McMaster-Mohawk
Bachelor of Technology
Partnership

McMaster University

Classes end: Tuesday, April 12th 2022
Final Examination Period: Thursday, April 14 to Friday, April 29
All examinations MUST be written during the scheduled examination period.

Note that this structure represents a plan and is subject to adjustment term by term.
The instructor and the University reserve the right to modify elements of the course during the term. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.

4. ASSESSMENT OF LEARNING *including dates*	Weight
Quizzes (5 total throughout the term, best 4 of 5 for final grade)	**20%**
Midterm Exam (scheduled for Wednesday, February 16th – online A2L)	**30%**
Final Examination (tests cumulative knowledge – online A2L)	**50%**
TOTAL	**100%**

Percentage grades will be converted to letter grades and grade points per the University calendar.

5. LEARNING OUTCOMES

1. Explain the effect of time on the value of money and apply it to engineering/financial decisions.
2. Apply appropriate comparison techniques in the evaluation of competing alternatives from an economic perspective.
3. Apply the concept of Minimum Acceptable Rate of Return and Internal Rate of Return for purpose of evaluating projects.
4. Calculate the value of an asset from an accounting perspective using the concept of depreciation.
5. Calculate the Equivalent Annual Cost of an asset for use in replacement decisions
6. Calculate the effect of Tax on engineering/financial decisions
7. Calculate the effect of inflation on the Minimum Acceptable Rate of Return and the Internal Rate of Return

6. COURSE OUTLINE – APPROVED ADVISORY STATEMENTS

ANTI-DISCRIMINATION

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.
http://www.mcmaster.ca/policy/General/HR/Discrimination_Harassment_Sexual_Harassment-Prevention&Response.pdf

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. It is your responsibility to understand what constitutes academic dishonesty.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/

The following illustrates only three forms of academic dishonesty: The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.

- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

AUTHENTICITY / PLAGIARISM DETECTION

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

COURSES WITH AN ON-LINE ELEMENT

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

ONLINE PROCTORING

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

COMMUNICATIONS

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their @mcmaster.ca alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, whether in person or online.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

McMaster Student Absence Form (MSAF): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work".

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office normally within 10 working days of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests. http://www.mcmaster.ca/policy/Students-AcademicStudies/Studentcode.pdf

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, including lectures by University instructors

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

EXTREME CIRCUMSTANCES

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.