Syllabus
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TRINE UNIVERSITY

COURSE SYLLABUS

COURSE TITLE: Finance for Engineers	**TIME & PLACE:** Hybrid:
TERM & YEAR:	**OFFICE LOCATION/HOURS:**
COURSE NUMBER:	**NUMBER OF CREDIT HOURS:** 3
INSTRUCTOR:	**EMAIL:** **PHONE:**
HELP DESK EMAIL: help@trine.edu	**HELP DESK PHONE:** (260) 665-4275, 1-877236-7682

COURSE DESCRIPTION: This course is a study of managerial decision making for engineers. Students will gain a deep knowledge of the economic viability of engineering decisions and learn an appropriate balance between design alternatives, resulting costs, and their impact on enterprise. Students will learn applied measurable concepts to maximize efficiency and competitive advantage.

PREREQUISITES: Must be admitted to either the MSEM, MSIM, or Certificate Program

REQUIRED TEXT:

1. Blank, L.T. & Tarquin A. J. (2018), Engineering Economy, 8th edition, McGraw-Hill, ISBN 9780073523439
2. American Psychological Association (2010). *Publication Manual of the American Psychological association* (7th edition). Washington DC: American Psychological Association.

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Note: It is strongly recommended to acquire a physical copy of the Blank & Tarquin textbook, as opposed to an e-book. Students will be allowed to use printed textbooks, but not e-books, during online quizzes.

LEARNING OUTCOMES: Upon completion of this course, the student should be able to:

1. Apply time value of money calculations to an engineering economy study framework.
2. Develop simple spreadsheet models supporting project evaluation.
3. Estimate project cost.
4. Evaluate alternative engineering projects, using the present worth, annual worth, and rate of return methods.
5. Assess project risk using sensitivity analysis.

GRADING/EVALUATION: Please see below for more detail regarding each category.

Category	**Overall Course Grade Weight**	**Points**
Quizzes (8 quizzes x 25 points)	1/3	200
Group Projects (2 projects x 100 points)	1/3	200
Discussion Forums (4 weekly forums x 25 points)	1/6	100
Infographics (2 infographics x 25 points)	1/12	50
Video Presentations (2 presentations x 25 points)	1/12	50
	Total	600

NOTE: ***All written assignments must conform to the guidelines set forth by the American Psychological Association, 7th Edition.***

TRINE GRADUATE GRADING SCALE:

Grade	**Percentage**	**Quality Points**	**Meaning of Grade**
A	93-100	4.0	Excellent
B+	86-92	3.5	Very Good
B	81-85	3.0	Good
C+	75-80	2.5	Above Average

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C	70-74	2.0	Average (lowest passing grade)
F	00-69	0.0	Failure
I	Incomplete	Not figured into GPA	
IP	In Progress (grade deferred)	Not figured into GPA	
W	Withdrawal	Withdrawal before completion of 80% of semester	
WP	Withdrawal	Withdrawal after completion of 80% of semester issued only under special circumstances and with approval of the department chair/director	

ATTENDANCE/PARTICIPATION:
Students are required to demonstrate class attendance by regular participation in all of the assigned activities and assignments, during each week of the class.

ACADEMIC MISCONDUCT:
The University prohibits all forms of academic misconduct. Academic misconduct refers to, but is not limited to, the following activities:

- Copying another person's work and claiming it as your own, or submitting the same paper in two different courses without knowledge and consent of the instructor (plagiarism);
- Using the work of a group of students when the assignment requires individual work;
- Requesting or purchasing materials from outside sources not consistent with the expectation of the assignment or assessment.
- Looking at or attempting to look at an examination before it is administered;
- Using materials during an examination that are not permitted;
- Allowing another student to take your examination for you;
- Intentionally impeding the academic work of others;
- Using any electronic device to transmit portions of questions or answers on an examination to other students;
- Using any electronic device to improperly store information for an exam; • Knowingly furnishing false information to the University;
- Assisting other students in any of the acts listed above.

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Moreover, a student is expected to submit his/her own work and to identify any portion of work that has been borrowed from others in any form. An ignorant act of plagiarism on final versions and minor projects, such as attributing or citing inadequately, will be considered a failure to master an essential course skill and is considered Academic Misconduct. A deliberate act of plagiarism, such as having someone else do your work or submitting someone else's work as your own (e.g., from the Internet, fraternity file, etc., including homework and in-class exercises), is also Academic Misconduct and will result in more serious penalties.

Artificial Intelligence (AI) is prohibited: All work submitted by students in this course must be generated by the student. Students may not have another person or entity contribute to an assignment for them, which includes using AI. Students may not incorporate any part of an AI-generated response in an assignment, use AI to formulate arguments, use AI to generate ideas for an assignment, or submit work to an AI platform for improvement. Using an AI tool to generate content may qualify as academic misconduct in this course.

OR

Artificial Intelligence (AI) is allowed: Students may use AI tools on instructor-identified assignments in this course. To adhere to our scholarly values, students must cite any AI-generated material that informed their work. Using an AI tool without proper attribution may qualify as academic misconduct in this course. It is the responsibility of the student to verify the accuracy, reliability, and ethical implications of AI-generated content.

In situations of Academic Misconduct, instructors have the authority to award a failing grade on the assignment in question or a failing grade for the course. Upon approval by the appropriate Dean, Academic Misconduct may also result in expulsion from the University.

ELECTRONIC DEVICES:

Use of electronic devices including smart watches and cell phones is prohibited during exams or quizzes unless directly allowed by the instructor.

WEEKLY QUIZZES:

A Moodle quiz will need to be completed at the end of each week. You will be allowed to use a physical copy of the textbook (no e-book), and any printouts or written notes you have, during the quizzes. In fact, you will need to use your textbook, or printed copies, to look up time value factors in the tables at the back of the textbook, in order to perform some of the calculations required. You are not allowed to use your cell phone, or communicate with anyone during the quiz. A stand-alone calculator (not a calculator built into a phone) is permitted, so long as it is in the camera view. A calculator will also be enabled on the computer screen during the quiz.

You will be required to use the Respondus LockDown Browser exam monitoring software during the quizzes. Please access the first quiz at least one day before the due date, to make sure you have time to troubleshoot in case you run into any technology related issues. In case you run into any technology related issues, always contact Trine IT help desk at 260-665-4275 immediately. There are a few common Respondus-related issues that some Trine students have encountered in the past, and the help desk will most likely be able to help you resolve the issue you are facing.

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GROUP PROJECTS:

The two projects instruct you to work on developing spreadsheet models in Excel, based on the topics covered. Everyone in the group earns the same grade for the project, unless there is a significant issue affecting the group work, that is communicated to the instructor, and deemed to require an intervention.

You are free to join a group consisting of up to 5 members. You also have the option to instead work, and submit the project on your own, individually. You are required to submit your team (or let me know that you are working individually) by the end of the first week.

Please see the project instructions posted on Moodle for more detail regarding project requirements, and the grading rubric file posted on Moodle for more detail regarding grading.

DISCUSSION FORUMS:

To receive full credit, you must post meaningful messages on at least 3 of 7 days during the week. Once you post your initial response to the discussion question, you must post a reply on at least two additional days during the specific week. The initial response is due no later than Wednesday. Your initial post should be between 200 - 300 words of substantive content (see below). The replies to fellow students and/or to the instructor should range between 100 - 150 words of substantive content (see below). This is a general guideline, but posts that are shorter will typically not receive full credit. Remember that our week begins on a Monday and ends on a Sunday.

The initial post needs to be written in response to the weekly discussion question posted under the discussion forum link. Please make sure you conduct some research and cite both our text and external credible sources.

Your postings in the discussion area should be substantive. Answers such as "me too" or "I agree" do not qualify as relevant, substantive participation. Please elaborate on your thoughts, ideas and opinions.

In your reply to another student's post, you can have a combination of the following: critique or argue with a specific point from the post; provide an example illustrating a specific point from the post; elaborate on, or provide more detail or discussion on a specific point from the post; ask a specific question about a specific point from the post. Your reply needs to be substantive. For instance, if the forum question is "Describe the three main financial statements and discuss the difference in the timing aspect of the statements." and if someone's post reads: "The statements are balance sheet, income statement, and cash flow statement. The difference is that the values reported on the income statement accumulate over time, while balance sheet and cash flow statement list numbers as a snapshot at a single point in time.", then your reply could be: "Hi classmate, you made a good point about the income statement values accumulating over time, for instance revenues are collected on different days, and need to be added together. Do you think the timing aspect is more important for quarterly or annual statements, or does it really matter? I also noticed that you may be wrong about the cash flow statement. The cash flow statement lists changes over time, and thus connects balance sheets from the beginning and end of the year. For instance, an increase in accounts receivable from the beginning to the end of the period would be listed as a negative cash flow, with a negative sign, on the cash flow statement. I

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normally only use the total operating cash flows from the cash flow statement, that's the most important number to look at I think. For everything else, we can use financial ratios computed from the balance sheet and income statement, in my opinion." An example of a bad reply, receiving a low score would be: "Hi classmate, your post was good, I really liked it, good job. I agree with what you wrote. I also agree that income statement accumulates over time. You may be a bit off mark on one or two points, but overall your post was really good. I learned a lot from your post. I wish you the best."

Please see the grading rubric file on Moodle for more details regarding grading.

INFOGRAPHICS:

One of the main benefits of this assignment is to provide an opportunity for you to actively engage with the material covered. The specific content that you will be asked to include in your infographics represents some of the more complex and confusing material covered in the course, and this type of assignment will allow you to engage with the material in a more visual way, helping you to have a better and longer lasting grasp of the concepts.

Instructions:

1. Create an infographic with content that follows the instructions under the infographic assignment link on Moodle. Start with a template, and add text and images as you see fit. You can use one of the sites listed below to get a template and create your file.
2. Upload your infographic to Moodle under the assignment link, by Sunday 11:59 PM EST.

Requirements: please see the grading rubric file posted on Moodle for more detail regarding grading

- Your infographic must have significant presence of both images and text
- It must clearly and effectively communicate the content, using multiple colors

(the two lists below are loosely based on information found at www.easel.ly)

Here are some of the benefits of using infographics:

- Make complicated concepts easier to understand
- Present content in a more eye-catching format
- Visual presentation often makes remembering easier
- Easier to communicate facts with icons and illustrations

Checklist:
Does your template help you relate your message?
Do the objects or images you found help you represent the content?
Does the size of your infographics fit all of the elements you want to incorporate?
Do your text boxes match in size?
Are your colors consistent?
Are all of the elements lined up properly?
Are your images the proper size?

All (or most of) the sites listed below provide you with free templates, and allow you to create and download an infographic.

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https://snappa.com/ https://www.visme.co/
https://www.easel.ly/
https://www.canva.com/
https://venngage.com/ https://piktochart.com/
https://infogram.com/

VIDEO PRESENTATIONS:
Please prepare a Microsoft PowerPoint file, according to the instructions posted under the assignment link on Moodle, and then record a video, capturing your screen and yourself on a web camera, presenting your slides. The length should be around 5 minutes.

There is an instruction video file posted on Moodle showing you how to capture and upload your presentation. You will go under the Video Presentation assignment, formatted as a discussion forum, and add a new post where you embed Kaltura media; it will let you create your video first under this link, which you can upload to "My Media" on Moodle, and then add it to the post from there.

Next, post two replies commenting on other students' video presentations, following the same guidelines as for the discussion forum posts (minimum 100 words of substantive content, post your replies on at least two different days of the week, different from the date you uploaded your presentation).

Please see the instructions under the assignment link for more detailed instructions, as well as the instruction video file posted on Moodle. Please see the grading rubric file on Moodle for more details regarding grading.

LATE ASSIGNMENTS:
Late assignments will NOT be accepted and will receive a grade of ZERO.

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TRINEONLINE

Course Mapping

FIN 5203 Finance for Engineers

Course Description: This course is a study of managerial decision making for engineers. Students will gain a deep knowledge of the economic viability of engineering decisions and learn an appropriate balance between design alternatives, resulting costs, and their impact on enterprise. Students will learn applied measurable concepts to maximize efficiency and competitive advantage.

Learning Outcomes: Upon completion of this course, the student should be able to:

1. Apply time value of money calculations to an engineering economy study framework. **(LO1)**
2. Develop simple spreadsheet models supporting project evaluation. **(LO2)**
3. Estimate project cost. **(LO3)**
4. Evaluate alternative engineering projects, using the present worth, annual worth, and rate of return methods. **(LO4)**
5. Assess project risk using sensitivity analysis. **(LO5)**

Week One: LO1,2	
Learning Activities and Materials	**Assessments**

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Read: Chapter 1: Foundations of Engineering Economy, Sections 1-10 **(LO1)** Watch: Chapter 1: Section 1 (7:02) **(LO1)** Chapter 1: Section 2 (8:42) **(LO1)** Chapter 1: Section 3 (8:17) **(LO1)** Chapter 1: Section 4 (10:04) **(LO1)** Chapter 1: Section 5 (10:01) **(LO1)** Chapter 1: Section 6 (17:10) **(LO1)** Chapter 1: Section 7 (8:33) **(LO1)** Chapter 1: Section 8 (7:45) **(LO1)** Chapter 1: Section 9 (12:03) **(LO1)** Chapter 1: Section 10 (3:08) **(LO1)** Chapter 1: Excel Examples – Future Worth (13:55) **(LO1) (LO2)** Chapter 1: Excel Examples – Present and Annual Worth, number of periods, interest rate (17:33) **(LO1) (LO2)** Chapter 1: Excel Examples – Amortization Table (14:58) **(LO1) (LO2)**	Discussion Forum: Which of the steps in an engineering economy study, outlined in chapter 1, do you consider the most important, and which the most challenging? Why? **(LO1)** Quiz: Chapter 1 **(LO1)**
Week Two: LO1,2	
Learning Activities and Materials	**Assessments**
Read: Chapter 2: Factors: How Time and Interest Affect Money, Sections 1, 2, 3, and 7 **(LO1)** Chapter 3: Combining Factors and Spreadsheet Functions, Sections 1-2 **(LO1) (LO2)** Chapter 4: Nominal and Effective Interest Rates, Sections 1-3 **(LO1)** Watch: Chapter 2: Section 1 (16:57) **(LO1)** Chapter 2: Section 2 (12:36) **(LO1)** Chapter 2: Section 3 (13:45) **(LO1)** Chapter 2: Section 7 (9:19) **(LO1)** Chapter 3: Section 1 (9:25) **(LO1) (LO2)** Chapter 3: Section 1 (14:48) **(LO1)(LO2)** Chapter 4: Introduction (2:21) **(LO1)** Chapter 4: Sections 1-3 (12:18) **(LO1)**	Infographics: Create an infographic that will guide you in using the Compound Interest Factor Tables in the textbook, while performing the various calculations that we cover in chapters 2-4. **(LO1)** Quiz: Chapters 2-4 **(LO1)**
Week Three: LO1,2,4	
Learning Activities and Materials	**Assessments**

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Read: Chapter 5: Present Worth Analysis 1, 2, 3, and 5 **(LO4)** Chapter 6: Annual Worth Analysis, Sections 1-5 **(LO4)** Watch: Chapter 5: Section 1 (14:04) **(LO4)** Chapter 5: Section 2 (9:43) **(LO4)** Chapter 5: Section 3 (9:43) **(LO4)** Chapter 5: Section 5 (6:25) **(LO4)** Chapter 5: Excel Examples – Present Worth Method with Revenues (12:48) **(LO2) (LO4)** Chapter 5: Excel Examples – Present Worth Method with only Costs (6:47) **(LO2) (LO4)** Chapter 5: Excel Examples – Present Worth Method with Unequal Lives (9:32) **(LO2) (LO4)** Chapter 6: Section 1 (1:56) **(LO4)** Chapter 6: Section 1 (2:50) **(LO4)** Chapter 6: Section 1 (2:47) **(LO4)** Chapter 6: Section 1 (5:23) **(LO4)** Chapter 6: Section 1 (3:43) **(LO4)**	Video Presentation: Create a short video where you present, in PowerPoint, your own example of either present worth or future worth analysis, covered in chapters 5 and 6. **(LO4)** Quiz: Chapters 5-6 **(LO4)**
Week Four: LO2,3	
Learning Activities and Materials	**Assessments**
Read: Chapter 16: Depreciation Methods, Sections 1-6 **(LO3)** Chapter 17: After-Tax Economic Analysis, Sections 1-5 **(LO3)** Watch: Chapter 16: Sections 1-2 (7:18) **(LO3)** Chapter 16: Section 3 (8:49) **(LO3)** Chapter 16: Sections 4-5 (10:46) **(LO3)** Chapter 16: Section 6 (8:05) **(LO3)** Chapter 17: Sections 1-2 (13:16) **(LO3)** Chapter 17: Section 3 (9:46) **(LO3)** Chapter 17: Sections 4-5 (13:46) **(LO3)** Chapter 17: Excel Examples – After-Tax Analysis (31:24) **(LO2) (LO3)**	Discussion Forum: Is accounting for the tax effects on project cash flows worth the effort? Please discuss and justify your answer. **(LO3)** Quiz: Chapters 16-17 **(LO3)** Group Project 1: Develop various spreadsheet models related to chapters 1-6, 16-17. **(LO1) (LO2) (LO3) (LO4)**
Week Five: LO2-4	

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Learning Activities and Materials	Assessments
Read: Chapter 7: Rate of Return Analysis: One Project, Sections 1-3 **(LO4)** Chapter 10: Project Financing and Noneconomic Attributes, Sections 1-7 **(LO3) (LO4)** Watch: Chapter 7: Section 1 (:) **(LO4)** Chapter 7: Section 2 (:) **(LO4)** Chapter 7: Section 3 (:) **(LO4)** Chapter 7: Excel Examples (:) **(LO2) (LO4)** Chapter 10: Section 1 (:) **(LO3) (LO4)** Chapter 10: Section 2 (:) **(LO3) (LO4)** Chapter 10: Section 3 (:) **(LO3) (LO4)** Chapter 10: Section 4 (:) **(LO3) (LO4)** Chapter 10: Section 5 (:) **(LO3) (LO4)** Chapter 10: Section 6 (:) **(LO3) (LO4)** Chapter 10: Section 7 (:) **(LO3) (LO4)** Chapter 10: Excel Examples (:) **(LO2) (LO3)**	Infographics: Create an infographic outlining and explaining the components of the weighted average cost of capital equation, in order to help you remember how the pieces fit together. **(LO3)** Quiz: Chapters 7, 10 **(LO3) (LO4)**
Week Six: LO2,4	
Learning Activities and Materials	**Assessments**
Read: Chapter 11: Replacement and Retention Decisions, Sections 1, 2, 3, 5, and 6 **(LO4)** Watch: Chapter 11: Section 1 (:) **(LO4)** Chapter 11: Section 2 (:) **(LO4)** Chapter 11: Section 3 (:) **(LO4)** Chapter 11: Section 5 (:) **(LO4)** Chapter 11: Section 6 (:) **(LO4)** Chapter 11: Excel Examples (:) **(LO2) (LO4)**	Video Presentation: Create a short video where you present, in PowerPoint, your own example of replacement analysis. **(LO4)** Quiz: Chapter 11 **(LO4)**
Week Seven: LO2-5	
Learning Activities and Materials	**Assessments**

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Read: Chapter 13: Breakeven and Payback Analysis, Sections 1-4 **(LO4)** Chapter 18: Sensitivity Analysis and Staged Decisions, Sections 1-6 **(LO3) (LO4) (LO5)** Watch: Chapter 13: Section 1 (:) **(LO4)** Chapter 13: Section 2 (:) **(LO4)** Chapter 13: Section 3 (:) **(LO4)** Chapter 13: Section 4 (:) **(LO4)** Chapter 13: Excel Examples (:) **(LO2) (LO4)** Chapter 18: Section 1 (:) **(LO3) (LO4) (LO5)** Chapter 18: Section 2 (:) **(LO3) (LO4) (LO5)** Chapter 18: Section 3 (:) **(LO3) (LO4) (LO5)** Chapter 18: Section 4 (:) **(LO3) (LO4) (LO5)** Chapter 18: Section 5 (:) **(LO3) (LO4) (LO5)** Chapter 18: Section 6 (:) **(LO3) (LO4) (LO5)** Chapter 18: Excel Examples (:) **(LO2) (LO3) (LO4) (LO5)**	Discussion Forum: Discuss some of the advantages and disadvantages of different approaches to sensitivity analysis, relative to each other. **(LO5)** Quiz: Chapters 13, 18 **(LO3) (LO4) (LO5)** Group Project 2: Develop various spreadsheet models related to chapters 7, 10, 11, 13, and 18. **(LO1) (LO2) (LO3) (LO4) (LO5)**
Week Eight: LO3	
Learning Activities and Materials	**Assessments**

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Read: Chapter 15: Cost Estimation and Indirect Cost Allocation, Sections 1-8 **(LO3)** Watch: Chapter 15: Section 1 (:) **(LO3)** Chapter 15: Section 2 (:) **(LO3)** Chapter 15: Section 3 (:) **(LO3)** Chapter 15: Section 4 (:) **(LO3)** Chapter 15: Section 5 (:) **(LO3)** Chapter 15: Section 6 (:) **(LO3)** Chapter 15: Section 7 (:) **(LO3)** Chapter 15: Section 8 (:) **(LO3)**	Discussion Forum: For what type of cost would it be best to apply which of the methods of estimating cost covered in Chapter 15, and why? Provide a few specific examples. **(LO3)** Quiz: Chapter 15 **(LO3)**

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