

Spring 2021

IE 492-454: Engineering Management

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NEW JERSEY INSTITUTE OF TECHNOLOGY

Department of Mechanical and Industrial Engineering

COURSE: IE-492 ENGINEERING MANAGEMENT

SEMESTER: SPRING 2021 - ONLINE

INSTRUCTOR: Lucie Thibeaud Tchouassi E.I.T
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TEXTBOOKS: *Schaum's Outline of Theory and Problems of Engineering Economics*,
Sepulveda, J., Souder, W. and Gottgfried, B., McGraw-Hill, Inc., 1984
Gido, J. and Clements, J., Successful Project Management 6th or 7th Edition
South-Western Publishing, 2009, 2012, 2015

COURSE DESCRIPTION: This course introduces engineering majors to the fundamentals of engineering economics and the factors necessary for successful project management. Engineering economics topics include basic concepts of engineering economics, capital project economics, time value of money and engineering ethics. Project management topics include project management concepts, needs identification, the project manager, project organizations, project communications, project planning, scheduling, control, cost performance and project management software tools.

COURSE DESCRIPTION This course covers the fundamental concepts of Engineering Economics and Project Management. It is designed to introduce engineering majors to application of basic finance, time value of money, and project management application of basic finance, time value of money, and project management principles to general engineering problems. Application of these principles helps facilitate decision making in practice

There are two parts to this course.

Engineering Economics section of the course will encompass the following topics: Interest Rates, Time Value of Money Estimating Capital Projects, Economic Feasibility Analysis and Decision Making. To reinforce the concepts learnt in class, we will have several assignments along the way that may include problems/questions, mini cases, and a term project.

Project Management section of the course will cover all phases of the project life cycle, starting from Project Initiation through Project Closeout. We will review various tools and methodologies that have been effective in managing various aspects of the project. We will also touch on popular project management methodologies applicable to a wide range of projects project including engineering and technology projects.

There will also be three quizzes and a final exam in this course.

It is expected that students will work in teams for the term project.

INDIVIDUAL PROJECTS ARE NOT PERMITTED IN THIS COURSE – NO EXCEPTIONS.

COURSE LEARNING

OUTCOME:

- Effectively apply knowledge of Engineering Management including Engineering Economics and Project Management in real world situations.
- Identify, formulate, and solve engineering problems.
- Effectively function on multidisciplinary and virtual teams.
- Apply course learnings and modern – popular management tools to engineering practice.

INSTRUCTIONAL

METHODS:

This section is distance learning / online section, and therefore all course materials will be delivered through online medium.

Canvas:

Canvas is an online platform used by NJIT to facilitate delivery of online lectures and materials.

Accessed via canvas.njit.edu

PowerPoint slides, homework problems, video links and other supporting materials will be uploaded for student review and download.

Assignments will be posted on Canvas.

Submissions will be via Canvas as well.

Canvas will also serve as a tool for group collaborations and discussions related to all class assignments and projects.

Textbooks/Assigned Literature:

There are two textbooks for this course. Both are required as one of the textbook covers Engineering Economics and the other covers Project Management section of this course.

It is expected that the students will read and refer to assigned textbooks as we will be covering materials from the same. Homework assignments will also be mostly from textbook. Lecture materials make the best effort to explain the material, but students must read/refer to the assigned literature for detailed explanation and understanding of the topic.

Web Resources:

- **Links to articles, videos, and other materials will be posted in Canvas.**

These links will be helpful in reinforcing concepts learned in this course.

It is also expected that students review online resources and news in order to reinforce concepts learnt in class.

It is all about connecting theory to real-life situations!

Articles, Books, Videos and internet– All will be used to enhance and aid in your experience.

NJIT HONOR CODE:

Honor Code, Academic Integrity and Class Behavior:

Please read the University's Academic Honor Code. Violations of NJIT's Academic Honor Code will lead to disciplinary consequences.

NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. In the cases the Honor Code violations are detected, the punishments range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT with notations on students' permanent record. Avoid situations where honorable behavior could be misinterpreted. For more information on the honor code use the link below.

<http://www.njit.edu/academics/honorcode.php>

New Jersey Institute of Technology is an institution dedicated to the pursuit of knowledge through teaching and research. The university expects that its graduates will assume positions of leadership within their professions and communities. Within this context, the university strives to develop and maintain a high level of ethics and honesty among all members of its community. Imperative to this goal is the commitment to truth and academic integrity.

Title IX Statement:

Under federal law, "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." Given the sensitivity of the topics covered in this class, it is important for you to know the professor has a mandatory obligation to notify designated University personnel of incidents of gender-based misconduct that are shared in private or during class discussions. The reason for this is to keep all students safe and connected to the resources & reporting options that are available. Hypothetical scenarios that are discussed do not require any action.

Statement on Inclusion and Diversity:

Students in this course are encouraged to participate freely and share personal opinions, perspectives, and stories. It is expected that there will be diverse and perhaps contradictory ideas shared; this variety is a strength of the academic community. Students are asked to show respect and treat peers in a way that validates various experiences and opinions based on a range of identities including ability, economic class, ethnicity, faith tradition or no faith, gender identity and expression, nationality, religion, sexual orientation, veteran status, and their intersections. Acts of bias, harassment, abuse, discrimination, relationship violence, sexual violence (i.e. sexual assault, sexual harassment, etc.), gender harassment, and stalking are not tolerated at NJIT. If you or someone you care about has experienced any one of these crimes and/or violations of NJIT Community Standards, please know that you have rights, reporting options, and other support services available to you.

SOFTWARE PROGRAMS:

It is expected that the students will have access to Microsoft Excel, Microsoft Word and Microsoft Project or similar throughout the duration of this The course contains several exercises that need to be completed in Microsoft Excel and Microsoft Project or similar. Furthermore, the final project for the course will require the use of these software applications as well. No other software is required for this course. Note that depending on your familiarity with Microsoft Excel, you may be able to use Microsoft Excel to create project plans for the term project. We will cover this in detail as we progress through the semester.

There are some free open source applications comparable to Microsoft Project but not as extensive as Microsoft Project:

- Trello
- Freecamp
- Basecamp

Most web based software may also allow the student groups to collaborate where an account can be created for each member of the group to access required information.

We will discuss project management software in detail as we progress through the course.

You may want to download Microsoft Project from NJIT IST website. <https://ist.njit.edu/software>. It is available for current students.

INSTRUCTOR**AVAILABILITY:**

I am usually available every day of the week. I check my emails on a regular basis and will respond within 24 to 48 hours. I am also available by phone during office hours from 9:00 am to 5:00 pm. As needed and upon request Webex meeting can be scheduled.

PEER**EVALUATIONS:**

As in the corporate world we will have peer evaluations in this course. You will be grading your group members at the end of the semester or various attributes. Peer evaluations will be counted towards the final grade for this course. This is typically known as 360-degree evaluation. Each student must submit a peer evaluation.

Like other courses at NJIT, you will have an opportunity to submit course evaluation, where you will grade the course, content, and me. Your feedback is very important to me and to NJIT and will help me in improving this course going forward. It is all about continuous improvements!

GRADING:

Online Participation/Case Studies and Questions	20%
Group Evaluation/Performance	10%
Quizzes (3 total)	21%
Term Project	15%
Final Report & Project Presentation	10%
Peer Evaluation	4%
Final Exam	20%
	100%

This course follows NJIT recommended grading schedule

A	100.00	90.00
B+	89.99	85.00
B	84.99	80.00
C+	79.99	75.00
C	74.99	70.00
D	69.99	60.00
F	59.00	BELOW

SPRING 2020 - COURSE SCHEDULE

DATE	WEEK	TOPICS	ASSIGNMENT	DUE DATES
			<i>IA: Individual</i> <i>GA: Group</i>	
1/17/2021	1	Introductions and Class Requirements Engineering Management, Engineering Economics Decision Making & Ethics	Posted Notes Self Introductions and expectations (IA) Group introductions	1/22/2021 1/23/2021

1/24/2021	2	Engineering Economics Basic Concepts & Annual Compounding Interest, Time Value of Money, Cash Flows Single-Payment, Uniform-Series, Gradient Series	Chapters 1 & 2 Schaum's Assigned Questions Assigned Problems	1/29/2021 1/31/2021
1/31/2021	3	Basic Relationships & Continuous Compounding Algebraic relationships and Solutions procedures, Discrete, period compounding, continuous compounding	Chapters 3, 4 & 5 Schaum's Assigned Questions Assigned Problems	2/5/2021 2/7/2021
2/7/2021	4	Team Project Team & Team Development Teamwork, Team Building, Effective Project Teams Ethical Behavior & Time Management	Posted Notes & Chapter 11 Gido Project Log/Team Progress Report (GROUP) QUIZ 1 - CHAPTERS 1-5	2/12/2021 2/13/2021
2/14/2021	5	Project Selection and Evaluation Methodology Equivalence Present Worth, Future Worth, Annual Equivalence Analysis	Chapters 6 & 7 Schaum's Assigned Questions Assigned Problems	2/19/2021 2/21/2021
2/21/2021	6	Project Selection and Evaluation Methodology Net Present Value, Rate of Return Payback Period, Benefit-Cost Ratio Investment Alternatives	Chapters 8 & 9 Schaum's Assigned Questions Assigned Problems	2/26/2021 2/27/2021
2/28/2021	7	Project Selection and Evaluation Methodology - Part II Retirement, Depreciation and Taxes Fundamentals of Engineering (FE) Exam Engineering Economics Introduction	Posted Notes Assigned Questions QUIZ 2 - CHAPTERS 6-9	3/5/2021 3/6/2021
3/7/2021	8	Initiating a Project Project Management Concepts Project Identification and selection Proposal Development	Chapters 1, 2 & 3 Gido Assigned Questions Project Plan Assignment (GROUP)	3/12/2021 3/14/2021

3/14/2021

SPRING BREAK

3/21/2021	9	People: The key to Project Success Project Manager, Project Team and Project Communication and Documentation	Chapters 10, 11 & 12 Gido Assigned Questions Term Project Part 1 & 2(GROUP)	3/26/2021 3/27/2021
3/28/2021	10	Project Planning, Performing and Controlling Scope Development Scheduling and Resource Utilization	Chapters 4, 5 & 6 Gido Assigned Questions Term Project Part 3 & 4 (GROUP)	4/2/2021 4/3/2021
4/4/2021	11	Project Planning, Performing and Controlling-Cont. Cost, Budget, Risk managementand Project closing	Chapters 7, 8 & 9 Gido Assigned Questions QUIZ 3 - CHAPTERS 1-3, 10-12	4/9/2021 4/10/2021
4/11/2021	12	Project Planning, Performing and Controlling	<i>Peer Evaluations</i> Term Project Part 5 & 6 (GROUP)	4/16/2021 4/17/2021
4/18/2021	13	Project Management Software Project Management Software Project Management Information Systems	App. A Gido Assigned Questions Draft Term Project (GROUP)	4/23/2021 4/24/2021
4/25/2021	14	Term Project Wrap-up Final Exam Review	Final Project (GROUP) Group Presentation (GROUP) <i>Review all course Materials</i>	5/1/2021 5/2/2021
		Reading Day 1		5/5/2021
		Reading Day 2		5/6/2021
		Final Exam Week	Final Exam	5/8/2021 5/9/2021

Assignment Requirement:All assignments will be posted in advance.Please do not go far ahead. For example, you must post your assigned solved problems or answers to questions and case studies by Thursday, 11:58 PM and Group assignments or any comments on responses by Saturday 11:58 PM, of that same week.

Note:if you do not submit your assignment by the assigned time you will automatically get an F for that part of the assignment.Please adhere to this timeline to ensure that you get the best grades for your efforts.

Term Project

The term project consists of developing a plan and a schedule for a real life project, based on the project plan that you developed in the beginning of the course. The project should be based on a project that will help with real life natural disasters, such as hurricane, earthquakes, forest fires, etc. You do not have to perform the project for this course; rather, you have to develop a detailed plan and schedule for it. You may develop a plan and schedule for a project that you are currently working on, one recently completed, or one that you will be undertaking in the near future. Projects may be related to your academic program, work experience, or personal but must help with natural disasters. Your group will be interdisciplinary so that you may use the strengths of the various majors.

Part 1:

A brief proposal of what project will be the basis for the course project. Team-based projects should include a list of all team members. (1 paragraph)

Part 2:

A detailed description of the project scope of work, including any assumptions. Clearly state project objective(s). (1–2 pages)

Part 3:

Work breakdown structure.

List of activities, including estimated duration of each activity (20–40 tasks).

Budget for each activity (hours for each person and any material costs).

Part 4:

Network diagram of the logical sequence of all activities.

Part 5:

Schedule table showing the duration, earliest start and finish times, latest start and finish times, and slack for each activity. Identify activities that make up the critical path. Discuss possible ways to reduce overall project duration and consequences of doing so.

Part 6:

Computer-generated network, schedule, resource histograms, and cost graphs.

Part 7:

Create a PPT presentation of your term project. Submit, in a report format, a final copy of all documents (parts) previously submitted and a copy of presentation visuals.

Final Project Due on

5/1/2021

Presentation of Final Project Due on

5/2/2021