#### NEW JERSEY INSTITUTE OF TECHNOLOGY

**Department of Mechanical and Industrial Engineering** 

COURSE:	IE-492 ENGINEERING MANAGEMENT

SEMESTER: FALL 2024 - ONLINE

 INSTRUCTOR:
 Lucie Thibeaud Tchouassi E.I.T

 Associate Dean for Academics, Newark College of Engineering (NCE)

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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

   The Standard for Project Management and A Guide to the Project Management Body of Knowledge

   PMBOK GUIDE Seventh Edition
- 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 DESCRIPTIONThis course covers the fundamental concepts of Engineering Economics and Project Management. It is designed<br/>to introduce engineering majors to application of basic finance, time value of money, and project management<br/>application of basic finance, time value of money, and project management principles to general engineering problems.<br/>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 two 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

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. Futhermore, 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<br/>semester or various attributes. Peer evaluations will be counted towards the final grade for this course. This is typically known as<br/>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 it very important to me and to NJIT and will help me in improving this course going forward. It is all about continuous improvements!

## GRADING:

	100.0%
Final Exam	20.0%
Peer Evaluation	3.0%
Final Report & Project Presentation	15.0%
Term Project	10.0%
Quizzes (2 total)	22.0%
Group Evaluation/Performance	10.0%
Online Participation/Case Studies and Questions	

100.0%

This course follows NJIT recommended grading schedule

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

# FALL 2024 - COURSE SCHEDULE

DATE	WEEK	TOPICS	ASSIGNMENT	DUE DATES
9/1/2024	1	Introductions and Class Requirements	Posted Notes	
		Engineering Management, Engineering Economics	Self Introductions and expectations (IA)	9/6/2024
		Decision Making & Ethics	Group introductions	9/7/2024
9/8/2024	2	Engineering Economics	Chapters 1 & 2 Schaum's	
		Basic Concepts & Annual Compounding		

	Interest, Time Value of Money, Cash Flows	EE Assignment #1	9/13/2024
	Single-Payment, Uniform-Series, Gradient Series	EE-G Assignment #1	9/14/2024
3	Basic Relationships & Continuous Compounding	Chapters3, 4 & 5 Schaum's	
	Algebraic relationships and Solutions procedures,	EE Assignment #2	9/20/2024
	Discrete, period compounding,	EE-G Assignment #2	9/21/2024
	continuous compounding		
4	Project Selection and Evaluation Methodology	Chapters 6 & 7 Schaum's	
	Equivalence	EE Assignment #3	9/27/2024
	Present Worth, Future Worth,	EE-G Assignment #3	9/28/2024
	AnnualEquivalence Analysis		
5	Fundamental of Engineering	Posted Notes - NCEES BOOK	
	FE Exam Procedures & Preparations	Project Log/Team Progress Report (GROUP)	10/4/2024
	Ethics and Professional Practice	QUIZ 1 - CHAPTERS 1-5	10/5/2024
	Fundamentals of Engineering (FE) Exam		10/6/2024
6	Project Selection and Evaluation Methodology	Chapters 8 & 9 Schaum's	
	Net Present Value, Rate of Return	EE Assignment #4	10/11/2024
	Payback Period, Benefit-Cost Ratio	EE-G Assignment #4	10/12/2024
	Investment Alternatives		
7	Introduction to Project Management & Environment	РМВОК	
	Overview and Objectives	PM-G Assignment #5-IND	10/18/2024
	Project Environment & Project Management	PM-G Assignment #5-GRP	10/19/2024
	Project Life Cycle and Phases		
	Project Stakeholders and Their Roles		
	3 4 5 7	<ul> <li>Interest, Time Value of Money, Cash Flows Single-Payment, Uniform-Series, Gradient Series</li> <li>Basic Relationships &amp; Continuous Compounding Algebraic relationships and Solutions procedures, Discrete, period compounding, continuous compounding</li> <li>Project Selection and Evaluation Methodology Equivalence Present Worth, Future Worth, AnnualEquivalence Analysis</li> <li>Fundamental of Engineering FE Exam Procedures &amp; Preparations Ethics and Professional Practice Fundamentals of Engineering (FE) Exam</li> <li>Project Selection and Evaluation Methodology Net Present Value, Rate of Return Payback Period, Benefit-Cost Ratio Investment Alternatives</li> <li>Introduction to Project Management &amp; Environment Overview and Objectives Project Environment &amp; Project Management Project Life Cycle and Phases Project Stakeholders and Their Roles</li> </ul>	Interest, Time Value of Money, Cash FlowsEE Assignment #1Single-Payment, Uniform-Series, Gradient SeriesEE-G Assignment #1Basic Relationships & Continuous Compounding Algebraic relationships and Solutions procedures, Discrete, period compounding, continuous compoundingChapters3, 4 & 5 Schaum's EE Assignment #2Fer G Assignment #2Discrete, period compounding, continuous compoundingEF-G Assignment #2Fer G Assignment #2EF-G Assignment #2Equivalence Present Worth, Future Worth, AnnualEquivalence AnalysisChapters 6 & 7 Schaum's EE-G Assignment #3Fer Fundamental of Engineering FE Exam Procedures & Preparations Ethics and Professional Practice Fundamentals of Engineering (FE) ExamPosted Notes - NCEES BOOK Project Log/Team Progress Report (GROUP) QUIZ 1 - CHAPTERS 1-5Fundamental of Engineering (FE) ExamChapters 8 & 9 Schaum's EE Assignment #4For Project Selection and Evaluation Methodology Net Present Value, Rate of Return Payback Period, Benefit-Cost Ratio Investment AlternativesPMBOK PM-G Assignment #4To Introduction to Project Management & Environment Project Life Cycle and Phases Project Ufe Cycle and Phases Project Ufe Cycle and Phases Project Stakeholders and Their RolesPMBOK PM-G Assignment #5-IND

10/20/2024	8	Project Integration Management	РМВОК	
		Project Integration Management Overview	PM-G Assignment #6-IND	10/25/2024
		Project Charter, Project Management Plan	PM-G Assignment #6-GRP	10/26/2024
		Directing and Managing Project Work		
		Monitoring and Controlling Project Work		
10/27/2024	9	Project Scope and Schedule Management	РМВОК	
		Project Scope Management Overview	PM-G Assignment #7-IND	11/1/2024
		Collecting Requirements and Defining Scope	PM-G Assignment #7-GRP	11/2/2024
		Creating a Work Breakdown Structure (WBS)	QUIZ 2 - CHAPTERS 6-9	11/2/2024
		Developing the Project Schedule		11/3/2024
		Controlling the Project Schedule		
11/3/2024	10	Project Cost and Quality Management	РМВОК	
		Project Cost Management Overview	PM-G Assignment #8-IND	11/8/2024
		Estimating Costs	PM-G Assignment #8-GRP	11/9/2024
		Determining the Budget		
		Project Quality Management Overview		
		Planning for Quality and Quality Assurance		
11/10/2024	11	Project Risk and Resource Management	РМВОК	
		Risk Management Overview	PM-G Assignment #9-IND	11/15/2024
		Identifying, Assessing, and Managing Risks	PM-G Assignment #9-GRP	11/16/2024
		Procurement Management Overview		
		Procurement Planning and Vendor Selection		
		Human Resource Management Overview		
11/17/2024	12	Project Management Software	РМВОК	
		Project Management Software	PM-G Assignment #10-IND	11/22/2024
		Project Management Information Systems	PM-G Assignment #10-GRP	11/23/2024

11/24/2024	13	Project Communication, Stakeholder, and Conclusion		
		Planning for Communication	Draft Term Project (GROUP)	11/26/2024
		Effective Communication and Reporting		
		Managing Stakeholder Engagement		
		Closing Projects and Lessons Learned		
		Course Recap and Certification		
		Final Project Presentation & Submission		
12/1/2024	14	Course Recap and Final Assessment	РМВОК	
		Final Exam Review	Peer Evaluations	12/6/2024
			Final Project (GROUP)	12/7/2024
			Group Presentation (GROUP)	12/7/2024
12/8/2024			Review all course Materials	
			Reading Day 1	12/12/2024
			Reading Day 2	12/13/2024
			Final Exam	12/14/2024

12/15/2024