NEW JERSEY INSTITUTE OF TECHNOLOGY
Department of Mechanical and Industrial Engineering

Course Summary:

COURSE:	**IE 492 – 452, IE 492 – 454, IE 492 – 456– ENGINEERING MANAGEMENT**
SEMESTER:	SPRING 2025 – ONLINE ONLY
INSTRUCTOR:	Ankush Karnik BS. IE, MS. EM, MBA, CSSGB, PMP, CSM, SAFe POPM, EIT Tel: (732) 893 0947 Email: apk1932@njit.edu
TEXTBOOKS:	▪ Project Management Institute, PMBOK Guide, 7th Edition, 2021. ▪ Sepulveda, J., Souder, W. and Gottfried, B., Schaum's Outline of Theory and Problems of Engineering Economics, McGraw-Hill, Inc., 1984 Note: You will also need to review additional sources – online or from the library in case the book falls short to thoroughly explain a specific concept, or if you want to learn more about a specific topic. An optional reference book that will serve as a good companion is Successful Project Management by Gido and Clements. The current edition is the seventh edition. But any prior editions will work. They should be available in the library.
COURSE DESCRIPTION:	This course covers the fundamental concepts of Engineering Economics and Project Management. It is designed to introduce engineering majors to the application of time value of money, and project management principles to general engineering problems and situations. Application of these principles helps facilitate decision making in practice. There are two parts to this course. The Engineering Economics section of the course will encompass the following topics: Interest Rates, Time Value of Money, Estimating Capital Projects, Economic Feasibility Analysis, Depreciation and Decision Making. The Project Management section of the course will cover all phases of the project life cycle, starting from Project Selection, 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 including engineering and technology projects. These concepts include Agile, Scrum, Kanban etc. Finally, we will also learn about project KPIs, and metrics used to monitor project progress and success.

	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. For the project management section of the course, we will use PMBOK by PMI. This will help students study for a Certified Associate in Project Management, or Project Management Professional certification exams in the future. 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 OUTCOMES:	● 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 a 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 textbooks covers Engineering Economics and the other covers the 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 textbooks. 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 on Canvas. These links will be helpful in reinforcing concepts learned in this course. It is also expected that students review online resources and news to reinforce concepts learnt in class. It is all about connecting theory to real-life situations!
NJIT HONOR CODE:	Please read and follow the NJIT University Code for Academic Integrity Any violation of the code will null and void all assignments and grades for this course. The alleged action will be reported to the Dean of Students office for further action. The NJIT Integrity and Honor Code site is provided below. http://www5.njit.edu/doss/policies/honorcode/index.php
PERSONAL MATTERS & HEALTH ISSUES:	The instructor should not be exposed to family matters, health, hospitalization, or other serious personal matters. Should a serious event happen, please communicate the issue directly and solely to the Dean of Students who will advise on how to proceed.
ACADEMIC INTEGRITY:	Since this is a distance learning / online course, all assignments, projects, and quizzes/exams can be completed from any location. It is expected that students will not collaborate with each other while completing assignments, quizzes, or exams unless otherwise indicated. Please note that tools utilized for this online course allow the instructor to identify and determine if the students were collaborating. Such instances and any occurrences of collaboration, when identified, are directly communicated to the department and the Dean of Students for further action.
ASSIGNMENTS:	To gain maximum benefit from the course, there are a mix of individual and group assignments to be completed over the course of the semester. There will be assignments due each week. Typically, individual assignments will be due on Fridays, and group assignments will be due on Sundays. Please make sure that the assignments are submitted via Canvas in a designated area on time every week. **Assignments will NOT be accepted via email or any other medium. NO EXCEPTIONS!**

	Please make sure you read the syllabus carefully and get to know the assignment's due dates.
QUIZZES & EXAMS DELIVERY	**Quizzes and Exams in this course will be administered online via Lockdown Browser**. The exam must be taken within the assigned time and date duration. The connection details for each quiz and exams will be posted on Canvas or sent via email as the date nears. There are no makeup quizzes or exams in this class. Please make sure to take the quiz in the allotted time or reach out to the instructor ahead of time in case of difficulties anticipated in taking the quiz or exam in the allotted time. Any communication received either after the start of the quiz or exam duration or after will not be honored regardless of the reason.
DELIVERABLE DUE DATES:	All assignments due dates are indicated in the 'Detailed Course Schedule' section in this document. Assignments must be received on Canvas by 11:59pm on the day they are due. **It is recommended that you do not wait until the last minute for submission to avoid any technical issues etc.** **Any assignment not received in Canvas by the due date/time will have a late penalty and 5% of assignment the grade will be automatically deducted for each day the assignment is late. Assignments will not be accepted via any other medium.** **The last day to submit all assignments for this course is May 7, 2025, which is the last day of the class. No assignments will be accepted after May 7, 2025. Upload capability in Canvas will be disabled after this date.**
GRADING:	Please see the Grading schedule mentioned in the 'Weighted Grades' section of this document. This course will follow NJIT recommended grading schedule as follows: A: for superior performance (90% or higher) B+: for excellent performance (87% to 89.99%) B: for very good performance (82% to 86.99%) C+: good performance (76% to 81.99%) C: for acceptable performance (70% to 75.99%) D: for minimum performance (65% to 69.99%) F: otherwise / inadequate **Grades will NOT be rounded to one significant digit or to the next whole number for a higher grade.**
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 course. 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. The above software programs are available for download from NJIT IST. Download instructions for Microsoft Project will be posted on Canvas. 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 will be available every day of the week. I will be checking emails regularly and will respond within 24 hours. I will also be available by phone if needed, but it is best to reach me via email first. However, feel free to call me if you do not hear from me within 24 hours, or if you have an urgent question. There are days when I may be travelling for work and during those days, I may be slow in responding to emails or queries, however it should not affect my availability or the class schedules overall.
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 may be counted towards the final grade for this course. This is typically known as 360-degree evaluation. Each student must submit a peer evaluation. **PLEASE NOTE: SUBMISSION OF PEER EVALUATION IS CRUCIAL TO ENSURE ALL TEAM MEMBERS HAD EQUAL CONTRIBUTION IN COMPLETING THE TERM PROJECT. IT IS IMPORTANT THAT ALL TEAM MEMBERS CARRY EQUAL WEIGHT IN THE TERM PROJECT. LATE SUBMISSIONS WILL NOT BE ACCEPTED. PLEASE SEE THE EVALUATION DUE DATE MENTIONED IN THE DETAILED COURSE SCHEDULE. THIS DATE IS DIFFERENT THAN OTHER ASSIGNMENT DATES.**
COURSE EVALUATIONS:	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 particularly important to me and to NJIT and will help me in improving this course going forward. It is all about continuous improvements!

Weighted Grades:

Class Participation (Online) – contribution to forums, questions, and case studies	**20%**
Quizzes (3 total)	**15%**
Term Project	**25%**
Final Project Report	**15%**
Final Exam	**25%**

SYLLABUS CONTINUED ON THE NEXT PAGE

Detailed Course Schedule

WEEK #	DATE	TOPICS	ASSIGNMENT	SUBMISSION DATES
1	1/21/2025 – 1/26/2025	**Engineering Management & Project Management Concepts and Framework**	**Class Slides** Introductions (Class) (I) Acknowledgement (I)	 1/26/2025 1/26/2025
2	1/27/2025 – 2/2/2025	**Time Value of Money & Compounding** Interest Rates, Inflation, Time Value of Money, Cash Flows, Single-Payment, Uniform-Series, Gradient Series, Annual Compounding	**Schaum's Chapter 1 & 2** Assigned questions (I)	 1/31/2025
3	2/3/2025 – 2/9/2025	**Basic Relationships** Algebraic Relationships, Discrete, Periodic Compounding	**Schaum's Chapter 3 & 4** Assigned questions (I) Assigned problems (G)	 2/7/2025 2/9/2025
4	2/10/2025 – 2/16/2025	**Continuous Compounding & Economic Equivalence and Valuation Evaluation Methodologies** Continuous Compounding, Equivalence, MARR, FMV	**Schaum's Chapters 5 & 6** Assigned questions (I) Assigned problems (G)	 2/14/2025 2/16/2025
5	2/17/2025 – 2/23/2025	**Quiz1**	Quiz 1 – Schaum's Chapter 1 -6 (I) **Note: Quiz will be available for a duration on this date. Details will be communicated later. All students must take the quiz within the allotted time. No extensions are given unless communicated via NJIT OARS office.**	**2/21/2025 - 2/23/2025**
6	2/24/2025 – 3/2/2025	**Evaluation Methodologies** Present Worth, Future Worth, NPV, Rate of Return, Payback, ROI, Cost-Benefit Ratio, Budget Allocation	**Schaum's Chapters 7 & 8** Assigned questions (I)	 2/28/20245
7	3/3/2025 – 3/9/2025	**Economic Feasibility Analysis**	**Schaum's Chapters 9, 10 &11** Assigned questions (I)	 3/7/2025

		Project selection, Retirement and replacement decisions/economics, Depreciation	Assigned problems (G)	3/9/2025
8	3/10/2025 – 3/15/2025	**Quiz2**	Quiz 2 – Schaum's Chapter 7 - 11 (I) **Note: Quiz will be available for a duration on this date. Details will be communicated later. All students must take the quiz within the allotted time. No extensions are given unless communicated via NJIT OARS office.**	**3/13/2025 - 3/15/2025*** ***Dates adjusted due to spring break.**
9	3/16/2025 - 3/22/2025	**Spring Break – Enjoy! – No Assignments**		
10	3/24/2025 – 3/30/2025	**Standard for Project Management –** System for Value Delivery & Project Management Principles	**PMBOK Guide – Standard for Project Management Chapter 1, 2, 3** Assigned questions (I) Term project deliverable #1 (G) - Proposal	 3/28/2025 3/30/2025
11	3/31/2025 – 4/6/2025	**PMBOK Guide Overview, Performance Domains –** Stakeholder Performance, Team Performance, and Development Approach and Lifecycle Performance Domains, Artifacts	**PMBOK guide – Body of Knowledge Chapter 1, 2.1 – 2.3, 4.6** Assigned questions (I)	 4/4/2025
12	4/7/2025 – 4/13/2025	**PMBOK Guide Overview, Performance Domains -** Planning Performance, Project Work Performance, Delivery Performance Domains, Artifacts	**PMBOK guide – Body of Knowledge Chapter 2.4 – 2.6, 4.6** Assigned questions (I)	 4/11/2025
13	4/14/2025 – 4/20/2025	**Quiz3**	Quiz 3 – PMBOK Guide Chapter 1,2,3, 1,2.1-2.6, 4.6 **Note: Quiz will be available for a duration on this date. Details will be communicated later. All students must take the quiz within the allotted time. No extensions are given unless communicated via NJIT OARS office.**	**4/18/2025 - 4/20/2025**

14	4/21/2025 – 4/27/2025	**PMBOK Guide Overview, Performance Domains –** Measurement Performance, Uncertainty Performance Domains, Tailoring, Artifacts	**PMBOK guide – Body of Knowledge Chapter 2.7, 2.8, 4.6** Assigned questions (I) Term project deliverable #2 (G) – Project Report	 4/25/2025 4/27/2025
15	4/28/2025 – 5/4/2025	**PMBOK Guide Overview – Tailoring, Sponsor, PMO**	**PMBOK guide – Body of Knowledge Chapter 3, Appendix X2, Appendix X3** Assigned questions (I)	 5/2/2025
16	5/5/2025 – 5/7/2025	**Final Exam Review**	Review all course materials. Term project deliverable #3 (G) - Final Report Peer evaluation submission (I) ***(Must be submitted by the due date – no exceptions!)***	 5/7/2025 5/7/2025
16	5/8/2025 – 5/9/2025	**Reading Days**		
16	5/10/2025 – 5/12/2025	**Final Exam** (Comprehensive – Engineering Economics and Project Management) **Note: FINAL EXAM will be available at a specific time. Details will be communicated later. All students must take an exam at the scheduled time.**	**Final Exam –** **See Canvas Module for timing.**	5/10/2025 – 5/12/2025* ***Dates adjusted due to the semester wide final exam schedule.**

NOTE:

- **(I) indicated individual submissions**
- **(G) indicates group submissions**