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**SYLLABUS**  
**IE 618 Engineering Cost & Production Economics**

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**COURSE DESCRIPTION**

This is a graduate course offers an overview of some important topics in cost management of operational activities. The course focuses on capital investment decision making and efficient resource utilization to achieve cost-effective operations. Topics covered in the course include alternative investment evaluation, budgeting activity-based costing, quality costs, life-cycle management and relevant behavioral science. The topics covered in the course are considered in the context of manufacturing and service industry application.

*Prerequisite Knowledge:* A basic understanding of manufacturing, engineering and economic concepts, along with the associated mathematical tools and critical evaluation techniques.

*Learning Objectives:* Demonstrate mastery of techniques necessary for cost analysis and control including standard costs, variance analysis, cost volume relationship, cost estimation, and utilization of accounting data for control of operations.

**Canvas**

The course will make extensive use of the Canvas system to optimize student-instructor communication. All course materials including lecture slides and homework etc. will be distributed through Canvas. All submission of homework and other assignments will also be through Canvas. To access the system please got to <http://canvas.njit.edu> , you will need a valid UCID to login.

**ONLINE CLASS SESSIONS & WEBEX:** Several times during the semester we may have an online class session. These sessions will be conducted through the WEBEX platform which is integrated with Canvas. To enter the WEBEX class click on ONLINE CLASS EVENT at the top of the course Canvas page. Note the WEBEX sessions do not occur every week.

**WEEKLY ASSIGNMENTS**

Success is greatly dependent on your study discipline. A key determinant of course success will be the discipline with which you complete the assigned tasks. The tasks are also listed under below in this document. Typical weekly activities include:

**LECTURE:** Attend the class session.

**VIDEO:** Click on the Video links in each topic and view the recordings. All videos are 7 minutes or less.

**TOPIC 1:**

V1 - What is cost engineering?

: <https://www.youtube.com/watch?v=jYnP1VhCnFg&feature=youtu.be>

V2 - What is production economics?

: <https://www.youtube.com/watch?v=P6iWfmlfv7E&feature=youtu.be>

V3 - Cost of goods sold: <https://www.youtube.com/watch?v=GPAIj3qCfLE>

**TOPIC 2:**

V3 - Cost behavior : <https://www.youtube.com/watch?v=ffFcck0SVxk>

V4 - Estimation of total cost

function: <https://www.youtube.com/watch?v=dudBRCS7Qkw>

V5 - Activity-based costing (ABC) -1

: <https://www.youtube.com/watch?v=Cp2ugvDkMP4>

Activity-based costing (ABC) -3

: [https://www.youtube.com/watch?v=U\\_N0MB53vhA](https://www.youtube.com/watch?v=U_N0MB53vhA)

**TOPIC 3:**

V 6 - Product costing: <https://www.youtube.com/watch?v=MC077Pe9XaQ>

**TOPIC 4:**

V9 - Support departments cost allocation - Zingerman's Community of Businesses: <https://www.youtube.com/watch?v=n3jcPV4IEVE>

V10 -Budgets for profit planning - High Sierra Sport

Company: <https://www.youtube.com/watch?v=l9pPLfgJ82A>

**TOPIC 5:**

Video: V12. Standard Costing - Navistar International

<https://www.youtube.com/watch?v=TaCvXXXVDKg>

Video: V13. Economic Value Added (EVA) - Herman Miller, Inc.

[https://www.youtube.com/watch?v=YJx\\_dDysdt0](https://www.youtube.com/watch?v=YJx_dDysdt0)

**TOPIC 6:**

Video: V14. Strategic Cost Management - BuyCostumes.com

<https://www.youtube.com/watch?v=0DpiqclE1aM>

Video: V15. The Value-Chain Analysis - Pizza Hut

<https://www.youtube.com/watch?v=EAU80JUDenY>

**TOPIC 7:**

Video: V17. The Balanced Scorecard - Southwest Airlines

<https://www.youtube.com/watch?v=lqqRAYVDL3c>

**TOPIC 8:**

Video: V19. Lean Manufacturing - Inovata Foods Corp.

<https://www.youtube.com/watch?v=Ftc7s1hGIAC>

Video: V20. CVP Analysis - Southwest Airlines

<https://www.youtube.com/watch?v=t-GJMzEh0lc>

**READINGS:** Download and review the readings in each topic.



White-Paper\_KPMG  
-TCO-Study-Final.pdf



Profitability-and-cost-analysis-An-Eye-o



gx-operations-cost-survey-report-2016.pdf



Fall\_2008\_Activity-Based Costing at Diebold



Excellence\_in\_cost\_management.pdf



csc11.pdf



ca-en-FA-cost-reduction-POV.PDF

## GRADING

Based in individual and team performance as follows:

10%	Homework Assignments	25%	Midterm Exam	25%	Term Project
10%	Corporate Profile	30%	Final Exam		

**HOMEWORK:** There will be homework assignments throughout the semester. The objective of homework is to reinforce the concepts covered in lectures, practicing and implementing solution techniques on problems, and prepare for the midterm and final exams. Homework assignments are individual task and must be done without collaboration. Therefore, **the work you turn in MUST be your own work**. All homework will be distributed online and you will also upload your submission online. Numerical questions will be completed online.

**MINIMUM ACCEPTABLE FORMATS:** All assignments should be completed in MS Word, PDF or equivalent. Camera images of handwritten pages are NOT acceptable and will NOT be graded.

**MIDTERM & FINAL EXAMS** - Specific instructions will be provided as we get closer to each exam. Midterm and final exams will be based on the course text and lectures. This is an individual effort and must be done without collaboration. Midterm and final exams will be closed-book and closed-notes. Except for non-programmable calculators, electronics, such as laptops or smart phones, are strictly not permitted. As we get closer to the exams, I will upload a detailed instruction sheet describing the exams and how you can take it.

Please note that NJIT recommended grading scheme is as follows:

- A for excellent performance (i.e., 90% or higher)
- B+ for good performance (i.e., 80 to 89.99%)
- B for acceptable performance (i.e., 70 to 79.99%)
- C+ for marginal performance (65 to 69.99%)
- C for minimum performance (60 to 64.99%)
- F or worst otherwise

## TEXTBOOK & READINGS

***IE 618 Engineering Cost & Production Economics slides*** - Will be distributed electronically through Canvas

***Cornerstones of Cost Management***, by Don R. Hansen and Maryanne M. Mowen, 3rd Edition, 2015, Cengage Learning, ISBN-10: 1-285-75178-7, ISBN-13: 987-1285751788.

***Course Readings*** – Several papers/reports/videos have been selected to complement the weekly topics. These are listed below, please complete each reading prior to the start of the topic.

## CORPORATE PROFILE PRESENTATION:

Each student should select a company noted in the requirements below. No two students should have the same company. The companies will be assignment based on first come first serve.



IE\_618\_Corporate\_Profile\_Requirements

## TERM PROJECT:

Students are required to work in groups in a term project. Groups' size will be determined by the number of students in class, but typically a maximum of 3 students would be in a group. Two components of the term project; a report documents all the project work, and a PowerPoint file to present (10-minute presentation) the project work in class.

1. Each team must (theoretically) manufacture a product of their own design (*can't use project material from work / another class*) and use the material learned in the course to present the business case for the product. The team will create a cost structure and will assign this cost using budget, activity-based costing system, create key performance indicators, perform value stream mapping, and show consideration to break-even analysis and non-production costs and do future planning.
2. The team will do an in-class ten (10) minutes PowerPoint presentation (*all members must present*) and submit a 10 pages minimum, Times Roman 12 font, 1.5 line spacing, 1 inch margins, (*page count excludes pictures and graphs*) team paper based on project (*one paper for the group with a work breakdown structure to show individual contributions*). The paper must include key concepts from each lecture to demonstrate mastery over the subject matter.
3. **Group members and product should be determined by lecture 2.** Project will expect to be insightful comments that reflect an understanding of economic considerations both local and global as related to the subject.
4. PowerPoint slides **DUE** electronically via email **by 12:00 pm noon on date of presentation.**

## ADDITIONAL ASSIGNMENT

Wk	TOPIC
1.	<i>Lecture #1:</i> Introduction to Cost Management <i>Video:</i> Topic 1 <i>Reading #1.</i> Effective Cost Management —Back to Basics
2.	<i>Lecture #2:</i> Cost Behavior and Activity-Based Costing <i>Video:</i> Topic 2 <i>Reading #2.</i> Activity-Based Costing at Diebold
3.	<i>Lecture #3:</i> The Job-Order Costing System and Process Costing <i>Video:</i> Topic 3
4.	<i>Lecture #4A:</i> Allocating Costs of Support Departments <i>Lecture #4B:</i> Budgeting for Planning and Control <i>Video:</i> Topic 4 <i>Reading #3.</i> Excellence in cost management
5.	<i>Lecture #5:</i> Standard Costing and Decentralization <i>Video:</i> Topic 5
6.	<i>Lecture #6:</i> Strategic Cost Management and Activity-Based Management <i>Video:</i> Topic 6 <i>Reading #4.</i> Cost improvement practices and trends in the Fortune 1000
7.	<i>Lecture #7:</i> The Balanced Scorecard and Quality Costs Management <i>Video:</i> Topic 7
10.	<i>Lecture #8:</i> Lean Accounting and CVP Analysis <i>Video:</i> Topic 8 <i>Reading #5.</i> Making cost savings real and making them stick
11.	<i>Lecture #9:</i> Tactical Decision Making <i>Lecture #10:</i> Pricing and Profitability Analysis <i>Reading #6.</i> Re-evaluating the total cost of truck fleet ownership
12.	<i>Lecture #11:</i> Capital Investment <i>Lecture #12:</i> Inventory Management <i>Reading #7.</i> Profitability and Cost Analysis – An Eye on Value

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Week	Day	Topic	HW Sets
1	Sept 8	Intro to Cost Mgmt / Basic Cost Mgmt Concepts - Ch.1 & 2	
2	Sept 15	Cost Behavior / Activity-Based Costing - Ch. 3 & 4	
3	Sept 22	Product and Service Costing / Process Costing - Ch. 5 & 6	HW1 Due
4	Sept 29	Allocating Costs / Budgeting - Ch. 7 & 8	
5	Oct 6	Standard Costing / Decentralization - Ch. 9 & 10	
6	Oct 13	Strategic Cost Mgmt / Activity-Based Mgmt - Ch. 11 & 12	HW2 Due
7	Oct 20	Strategic-Based Control / Cost of Quality - Ch. 13 & 14	
8	Oct 27	<b>Midterm Exam</b>	
9	Nov 3	Lean Accounting and Productivity Measurement - Ch. 15	
10	Nov 10	Cost-Volume-Profit Analysis - Ch. 16	
11	Nov 17	Tactical Decision Making / Pricing & Profitability - Ch. 17 & 18	HW 3 – Corp Profile
12	Nov 24	<b>Thanksgiving Break – No Class</b>	
13	Dec 1	Capital Investment/ Inventory Management - Ch. 19/20	HW 4 Due
14	Dec 8	Term Project - Team's Presentations	
15	Dec 15	<b>Final Exam</b>	
16	Dec 22		

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