

Fall 2019

IE 335-001: Engineering Cost Analysis

Athanassios Bladikas

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IE 335 ENGINEERING COST ANALYSIS

T/F 2:30-3:50PM – GITC 2305

Athanassios Bladikas

Fall 2019

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BSIE Program Educational Objectives

1. Program graduates use the fundamental principles and major areas of Industrial Engineering in their professional practice.
2. Program graduates are life-long learners, pursuing graduate education, and professional growth in Industrial Engineering and related fields.
3. Program graduates pursue diverse career paths and advance in a variety of industries.

BSIE Student Outcomes

- (1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- (2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social and economic factors
- (3) An ability to communicate effectively with a range of audiences
- (4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and social contexts
- (5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- (6) An ability to conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
- (7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

IE 335 Outcomes of Instruction:

- 1 Learn the terminology and principles of accounting and be able to record transactions in the appropriate accounts (4, 6).
- 2 Be able to analyze financial statements using a variety of ratio (4).
- 3 Learn cost/volume relationships and use cost drivers to compute break-even points or determine profit/loss levels (4, 7).
- 4 Be able to do budgeting and activity-based costing (4, 7).
- 5 Demonstrate their possession of written and oral communication skills (3, 4, 7).
- 6 Use other than cost considerations in economic analysis (3, 4, 7).

TEXT: Horngren, C.T., et.al., *Introduction to Management Accounting*, 16th Edition, Pearson, 2014.

Also see Journals such as: Management Accounting, Cost Management, Cost Engineering, Harvard Business Review, Sloan Management Review, Manufacturing Engineering, and Industrial Engineering.

www.prenhall.com/horngren for student resources made available by publisher with text.

GRADING: Test1, Test 2, and Final: 25% each.

Term paper: 25% (1/5 of which devoted exclusively on the quality and suitability of references)

WEEK	TOPIC	Chapter Homework problems
	(Dates are approximate)	
1(9/3)	Introduction- Engineering Cost Analysis Overview- Application, skills and knowledge required. Interaction between engineering, economics, finance and accounting.	1
2(9/10)	Basics of financial/cost management. Elements of financial accounting and development of income statements and balance sheets.	15, Appendix 15A 15B A1, A2, A3, 38,41,42,43
3(9/17)	Continuing subject matter of Week 2 Cash flow statements. Inventory methods.	16, Appendix 16A A1, A2, B3, 55, 57, 59
4(9/24)	Understanding and analysis of financial statements, Ratio analysis, Difficulties of income measurement	17 part 2, pp 728-737 B5, 38
5(10/1)	TEST # 1 – Group formation and topic choice	
6 (10/8)	Cost- Volume relationships, Cost drivers, Fixed and variable costs, Breakeven points, Volume profit planning and analysis	2 A1, A2, 43,44,45,60
7(10/15)	Cost function. Development and behavior, Methods of measurement, Application of regression analysis	3, Appendix 3 32,35,46,48
8(10/23)	Cost management systems, Cost classification, Job order process, Activity based, Cost driver, Identification and activity based management. References Due	4 B1, B2 B3, 41, 42, 43
9(10/29)	Cost analysis- Marketing applications, Relevant costs, Special orders, Product addition or deletion, Target costing, Pricing decision.	5 A2, B1, B2, B3, 40
10(11/5)	TEST # 2	
11(11/12)	Cost analysis, Production and operations management application, Opportunity costs, Make or buy, Joint product costs, Sunk and unit costs. Flexible budgets, Standard cost and Variance analysis	6 33, 34 B2, B3, B4, B5, 36, 37
12(11/19)	Flexible budgets, Standard cost and Variance analysis	7 B1, 28, 29, 30
		8 A2, 26, 27, 28, 29, 43
13(11/26)	26th – No class(it is “Thursday”), 29th No Class (Break) We meet only on the 27st – Wed., which is “Friday” Cost allocation- Activity based costing, Job order cost systems.	12 45, 46, B1
14(12/3)	Process cost systems and overhead, Cost allocation, Analysis and control	13
15(12/6)	Term Paper Presentations	
(12/10)	Term Paper Presentations	
12/17-22	FINAL EXAM – Time & place to be assigned	

TERM PAPER

Write a comprehensive, detailed term paper on the economics and other concerns of an energy issue.

This will be a group (~3) effort. You will be assigned to groups, but each group will pick its own topic by the time the first test is given.

There is considerable debate on energy issues. Experts, politicians, government agencies and the public propose various solutions for the future. Pick one of the following solutions:

- Drill for more oil
- Use natural gas
- Use nuclear power
- Use wind-generated power
- Use solar power
- Use biofuels
- Use hydrogen
- Use geothermal, tidal, etc. sources (if you can find enough material for a good job)
- Or something else that is not listed above

Write a term paper that analyzes the cost and the economic and non-economic impacts of your energy source on the economy overall. The economy may be that of the US (probably you will have more data on this) or the world. The impacts could be environmental, health and safety, political, social, etc. If the impacts can be quantified in terms of dollars, do so. If not, discuss them in non-monetary values. Draw conclusions about the feasibility of using your energy source in the future and outline its impacts in detail. All references should be listed at the end, and statements should be made about the truthfulness of those obtained from non-traditional sources (blogs and such). You will present your results during the last week of the semester.

The term paper is considered an important component of the course. **This term paper is due at the last class meetings prior to the final examination.** Lateness will result in a reduction of the grade. To avoid an unsatisfactory submission students are strongly urged to consult with the instructor prior to beginning this assignment should any of the requirements be unclear. Also, experience has shown that the paper should be started no later than the 7th week of the term. **A draft of references is due five weeks before the end of the semester.**

Library Research Assignment

Due date: Friday, October 23th, 2019

1. State the title of your research paper
2. Write a summary of about 120 words of your research paper.
3. Make a list of about 8 to 10 references in **APA style** that will be cited in this research paper. The list must include all of the following:
 1. Scholarly journal articles
 2. Books
 3. Scholarly websites

Information Literacy Outcomes/Competencies

OUTCOMES		DESCRIPTION
1. Define the research topic and the need for information	IE 335	a. Articulating a research question, problem, or issue. b. Obtaining background information to identify and define key concepts and terminology related to the research (e.g., putting the research question in context). c. Defining a manageable focus and timeline for completing the project. d. Identifying the types of materials that can be used for research (books, journals, Web sites, government documents, primary sources, datasets, media, technical reports, etc. (and that are needed and appropriate for the project). e. Recognizing that information may be limited, unavailable, or may not exist on a given topic.
2. Develop and implement an effective search strategy appropriate for an information need	IE 335	a. Differentiating among the types of reference sources (specialized encyclopedias, article databases, citation indexes, bibliographies, library catalogs, search engines, etc.) and the purposes of each. b. Choosing and accessing appropriate reference sources for a given research question. c. Using search terms appropriate to the research tool and the topic. d. Transferring skills learned in previous research efforts to new projects.
3. Locate and retrieve information	IE 335	a. Using the library's online catalog, online union catalogs, article databases, Web search engines, and other research tools effectively, in print and online. b. Interpreting citations accurately and using appropriate components of a citation to search for the items. c. Recognizing key elements of call numbers and URLs and using them to locate library materials and Web sites.
4. Evaluate information	IE 335	a. Investigating the author's or sponsoring body's expertise, credibility, and points of view. b. Assessing the authority, accuracy, reliability, completeness, and timeliness of the information found in books, articles, Web sites, etc. c. Distinguishing between reliable and unreliable sources of information, scholarly and popular sources, substantiated facts and points of view.
5. Assess the research strategy	IE 335	a. Determining whether the information retrieved is relevant and sufficient for the project or whether additional sources are needed. b. Analyzing successes and failures, revising research topics, and trying different techniques and research tools as needed.
6. Employ principles consistent with the ethical and legal uses of information	IE 335	a. Demonstrating knowledge of the issues regarding intellectual property and plagiarism in a U.S. academic setting. b. Citing and acknowledging sources appropriately. c. Creating accurate references using a consistent citation style.
7. Organize, synthesize, and communicate information	IE 335	a. Examining, categorizing, and storing citations to the materials discovered while conducting research, e.g., in reading and online searching. b. Managing the information selected and the research materials consulted. c. Using and integrating information from a variety of sources appropriate to the research question. d. Presenting the information in an effective and coherent manner to communicate it to others.
8. Effectively navigate the body of knowledge within the student's major discipline	IE 335	a. Recognizing how the literature in the major discipline is organized. b. Distinguishing among primary, secondary, and tertiary sources in the major discipline and their uses. c. Using key research tools and databases in the major discipline.

HONOR CODE

II. Article 2 - Violations Against the University Code on Academic Integrity

A. Section 1. Violations of Academic Integrity and Range of Sanctions

1. Violations of academic integrity are grouped into four general categories, based upon the degree of seriousness of the offenses. Descriptions of the violations and the range of sanctions within these categories are provided below. In addition to these sanctions, those stated in the Professional Conduct Code may be applied concurrently.
2. Repeated offenses of academic integrity (for the same level of incident) shall be treated at the level above (in seriousness) the original (or previous) offense.
3. The disciplinary action(s) imposed by the Committee on Professional Conduct will not appear on the student's transcript, except in cases of suspension or expulsion. In the case of suspension, the transcript notation will be removed when the student is eligible to return to the university.
4. The university reserves the right to adjudicate alleged violations either during the academic term when the incident occurs, or after that term, and may revoke a degree which was awarded before the violation was adjudicated.

B. Section 2. Student Transcript: XF Sanction System

1. A student who fails a course due to academic integrity violations will be assigned a grade of "XF" in that course and placed on probation for a period to be determined by the sanctioning authority. The "XF" will be treated in the same way as an "F" for the purposes of Grade Point Average, course repeatability, and determination of academic standing.
2. Once the probationary period has passed, the student may petition the Dean of Students Office to remove the "X" portion of the grade after completion of an ethics workshop. The student will have up to two years to attend the workshop and have the "X" removed. After that time the "X" will remain permanently.
3. Notation on the student's transcript shall read, "Failure due to academic dishonesty."
4. Students with the "XF" designation will be prohibited from officially representing the university, holding office in a student organization or representative body during their probationary period.
5. Receiving more than one "XF" grade will result in expulsion.