SE 52000 Engineering Economics

Course Objective:

This course will provide an overview of financial accounting and economic principles employed by engineers involved in product and system development. It is intended to familiarize engineers with methods in project accounting, budgeting, cost estimation, financial management, design optimization and economics.

Topics include:

- The Time Value of Money and Interest Formulas
- Decision Making among Alternatives
- Cost as an Independent Variable and System Design
- Accounting and Depreciation
- Cash Flow, Budgeting and Cost Estimation, Return on Investment (ROI) and Payback
- Systems Engineering Management Plan (SEMP), Work Breakdown Structure (WBS) and Chart of Accounts
- Traditional Cost Allocation, Lean Accounting and Earned Value Management (EVM)
- Defense Contract Audit Agency (DCAA) and Department of Defense (DoD) Acquisition Process Compliance

Credits: 3
Level: Dual Level; Undergraduate and Graduate

Preparation for Course: Senior or Graduate standing in an engineering or science degree program

Course Outcomes:

1. An understanding of the time value of money and how to make investment decisions among alternatives
2. An understanding of the pros and cons of Cost as An Independent Variable (CAIV) and trading other acquisition variables with respect to cost
3. The ability to create a Cash Flow Statement and budget for a project
4. An understanding of the techniques to estimate project cost and ROI
5. Understand how to develop a Work Breakdown Structure (WBS) and Systems Engineering Management Plan (SEMP) to document project scope and to derive the chart of accounts from the WBS
6. Familiarity with pros and cons of traditional and lean cost allocation methodologies and Earned Value Management (EVM) Metrics
7. Be able to evaluate whether a company’s operating policies are compliant with Defense Contract Audit Agency (DCAA) and Department of Defense (DoD) Acquisition process regulations
8. Gain a basic understanding of double entry accounting

Evaluation: 25% Final Exam
25% Homework – 5 Problem Sets
15% Meeting 1 – DCAA Presentation and Write-Up
15% Meeting 2 – ERP Presentation and Write-Up
20% Meeting 3 – Board Meeting Presentation and Final Project Write-Up

Homework: Some homework assignments will require a short (5 minute) presentation in class, followed by Q&A; be prepared to discuss all homework assignments in class.

Project: Separate Handout

Disability Policy If you have a disability and need assistance, special arrangements can be made to accommodate most needs. Contact the Director of Services for Students with Disabilities (Walb Union Bldg., Room 113, telephone number (260.481.6658) as soon as possible to work out the details. Once the director has provided you with a letter attesting to your needs for modification, bring the letter to me. For more information, please visit the web site for SSD "http://www.ipfw.edu/disabilities/."
For your presentations and papers, please submit an electronic copy of your paper and presentation to me by 6pm on Tuesday (the day before class).

Please provide to me a paper copy of your project Write Up and full-size presentation slides on the night of class.

Bring your computer with your presentation file and be prepared to plug your computer into the AV system for your presentation.

A Note about technical writing:
1. Do not use personal pronouns: I, we, he, she, they, it and also you, me, my, mine, etc..

2. When you have to use the word “this”. Please use the form this <noun i.e., a thing>. For example, correct usage: This information is really good. Incorrect usage: This is really good… as the reader does not necessarily know what this refers to, particularly in a technical document.

3. Use of Acronyms: When introducing an acronym state the acronym with initial capital letters, for example, Integrated Logistical Support (ILS) and the put the initial caps in parentheses after the acronym that you are introducing.

4. Grammarly. Please check out this tool. The higher the Grammarly score, the better your writing is.

A Note about assignments:
1. Please number (paginate all documents that are turned in).
2. Please put your name on all of your work.
3. For presentations, please use a large enough size font that we can read from the back of ET235.