



Syllabus

March 2008

EM/SDOE 620 Engineering Cost Management

PURPOSE: This memorandum provides each student the administrative details and guidance necessary to successfully complete EM/SDOE 620.

TEXT: Engineering Cost Analysis and Management, John V. Farr, Draft Textbook, Version 1.0.

SOFTWARE: Crystal Ball Simulation Software, Excel

COURSE DESCRIPTION:

This course will provide an understanding of both the tools and models that can be used throughout the design, development, and support phases of a system to conduct trade-offs between system performance and life-cycle cost. The students will be exposed to the cost benefit analysis process as a strategic tool during system design and development consistent with the principles of Cost as an Independent Variable (CAIV). The students will also be exposed to the formulation of cost-estimating relationships in this context. The course will focus on the use of tools and the development of models from case studies.

COURSE OBJECTIVES: This purpose of this course is to provide the students with the following capabilities:

Objective 1: To apply modern software packages to conduct analysis of real world data.

Objective 2: To understand the technical underpinning of engineering economic analysis.

Objective 3: The ability to apply the appropriate analytical techniques to a wide variety of real world problems and data sets.

Objective 4: To summarize and present the analysis results in a clear and coherent manner.

STUDENT PERFORMANCE ASSESSMENT:

Graded Events	% of Course
Class Problem Portfolio	50
Course Project	50
Course Total	100

Project and Homeworks

Project and homeworks are scheduled for submission on the dates shown on the "Lesson Schedule." For SDOE classes they are due 10 weeks from the day of the last class. Prior approval must be received for late submissions.

Regrading

If you would like to submit a homework assignment, exam, or project for regrading, please do not write anything on your paper before you resubmit it. Instead, simply attach a sheet of paper listing the problem numbers you would like to be regarded and what your issues are with the grading. **You must submit your concerns in writing in order for a problem or project to be regraded.**

GRADING AND CRITERIA FOR PASSING:

- (1) Turn in all written material (see Lesson Schedule).
- (2) Final grades will be awarded in accordance with the following scale:

Grade	Percentage
A	90 - 100
B	80 - 89
C	70 - 79
F	<70

Schedule for EM 620 Engineering Cost Management

Class No.	Topic	Reading/Assignments
1	<ul style="list-style-type: none"> ○ Overview of Class and Team Project ○ Review Operational Effectiveness Discussion and place in context ○ SE Process and Costing ○ Engineering Cost Estimation ○ Colors of Money/Costing: <ul style="list-style-type: none"> ○ Acquisition, Procurement, LCC, ○ Design/Development, TOC ○ Colors of Money: <ul style="list-style-type: none"> ○ Bid and Proposal, Overhead, IR&D, profit, ○ Government 6.1 – 6.5 ○ Various names, and need to understand as the SE what can pay for what ○ Cost Estimation ○ JSF Case Study 	Chapter 1 of ECAM Class Slides
2	Review of Engineering Economics I <ul style="list-style-type: none"> ○ Choice Among Alternatives ○ Cash Flows ○ Time Value of Money ○ Equivalence ○ Economic Worth 	Chapter 2 of ECAM Portfolio Problems 1 and 2 Class Slides
3	Review of Engineering Economics II <ul style="list-style-type: none"> ○ Review ○ Figures of Merit ○ Lease Versus Buy ○ Some Case Studies 	Chapter 2 of ECAM Class Slides
4	LCC What is LCC Four Ways of LCC <ul style="list-style-type: none"> ○ Analogy ○ Parametric ○ Engineering Cost Methods ○ Cost Accounting 	Chapter 3 of ECAM Portfolio Problem 3 Class Slides
5	Systems Engineering Scoping and Cost Estimation I <ul style="list-style-type: none"> ○ Design to Cost (DTC) ○ Trade Studies ○ Baseline and Standards Management ○ Requirements ○ Make sure that the stakeholders understand the differences and consciously choose from: <ul style="list-style-type: none"> ○ Design to Value ○ Design to Cost ○ Design to Affordability ○ Design to Schedule ○ Design to Performance 	Chapter 5 of ECAM Class Slides

Class No.	Topic (continued)	Reading/Assignments
6	Systems Engineering Scoping and Cost Estimation II <ul style="list-style-type: none"> ○ WBS Development ○ Systems Estimating Techniques ○ Hardware and Software ○ COSYSMO 	Chapter 4 of ECAM Class Slides
7	Simulation Based Costing I <ul style="list-style-type: none"> ○ Introduction to Simulation Based Acquisition ○ Simulation Overview ○ Process Generators ○ Queuing 	Chapter 5 of ECAM Class Slides Crystal Ball Software
8	Simulation Based Costing II <ul style="list-style-type: none"> ○ Simulation Using Spreadsheets ○ Using Crystal Ball 	Chapter 5 of ECAM Class Slides Portfolio Problem 4, 5
9	CAIV <ul style="list-style-type: none"> ○ Definitions ○ Tradeoffs ○ Case Study 	Chapter 7 of ECAM Class Slides
11	COTS and Open Source <ul style="list-style-type: none"> ○ COTS, GOTS, MOTS ○ Technology Refreshment ○ Open System Standards ○ Cost of Software Reuse ○ FCS Case Study 	Chapter 8 of ECAM Class Slides
12	Software <ul style="list-style-type: none"> ○ Sizing ○ Cost Estimation ○ Cocomo ○ Other tools: Price S, Galorath's SEER-SEM, etc. ○ Handling the various code types: Developed, reused, modified, purchased COTS, tailored COTS, open source, etc. 	Chapter 6 of ECAM Class Slides Portfolio Problem 6
13	Business Case Analysis – B2 Bomber <ul style="list-style-type: none"> ○ Value Engineering ○ Life Cycle Costing ○ Role of Requirements Creep ○ Global Economic Perspective 	Chapter 9 of ECAM Class Slides Portfolio Problem 7
14	Summary and Course Review <ul style="list-style-type: none"> ○ Summary ○ Graded Requirements 	Class Slides