Engineering Financial Management

Fall 2012 ETM 535

PSU - ETM
Department of Engineering and Technology Management

Fall 2012
What the Course Is Not!

Participants will NOT do accounting

or qualify to become a CPA!

To borrow from a somewhat common term:

Participants will not become ‘bean counters’
What the Course Is:

Instead, participants will learn how decisions affect the financial health and performance of the business.

Decisions such as:

- How many Beans does the business require to earn the expected profit?

- What are the production, quality and overhead costs to acquire, manufacture and sell the Beans?

- Or, can we engineer a new Bean and at what cost?
Why Should This Course Be Important to You?

“Financial realities are what drive a business. In order to improve the intelligence of decision making, provide analysis related to products, markets, and strategies, and present a budget to senior management….“ Edward Fields – consultant and author

“Whether your background is marketing, manufacturing, distribution, research and development, or the current technologies, you need financial knowledge and skills if you are to really understand your company’s decision making, financial and overall management processes. ” Excerpt from the course textbook
Why Should This Course Be Important to You?

“If your professional career includes the desire to someday hold a management position in the fields of engineering research and technology development, you will need to know the foundations of financial management.”

Jeff Busch - business practitioner and course instructor
## Course Topics and Coverage!

<table>
<thead>
<tr>
<th>How project management fits into business operations and alignment of business strategy.</th>
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<td>Project performance &amp; cost management.</td>
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<td>The role of the department manager.</td>
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<td>Main concepts on economic &amp; financial analysis, including: financial ratios, cash flow, balance sheets, income statements, assets, revenue, liability and budgets.</td>
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<td>Revenue flow and budget</td>
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<td>Cash Outflow and Inflow</td>
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<th>A few of the course objectives:</th>
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<tr>
<td>Resource Management</td>
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<td>Asset Management</td>
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<td>Elements of Cost &amp; Performance Indicators</td>
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<td>Cost Forecasting</td>
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<td>Organization Structure &amp; Business Design</td>
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<td>The Enterprise: Portfolio, Program and Project Management Alignment</td>
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<td>Benchmarking and Metrics for business decisions</td>
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<td>Zero-based budgeting</td>
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<td>Outsourcing cost/benefit assessment</td>
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<td>Awareness of the Financial Aspects of Corporations</td>
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**Things You Will Learn: Business Process & Strategies**

$$ Within Portfolio Management, two strategies rise to the top and are used to select which projects or initiatives move forward. $$

Financial Strategy:

- Involves profitability and return metrics such as NPV, ROI, payback periods, etc.

Business Strategy:

- Allocates monetary funding based on the type of project, its importance and relationship to the overall business direction or strategic goals.

*Project Portfolio Management – RG Cooper, SJ Edgett & EJ Kleinschmidt*
**Things You Will Learn: Where do the $$$ come from?**

For Example: Zero-based Budgeting

Corporations budget projects from a pool of money that is also used to pay for many things, including facilities, equipment, travel, IT, HR, Op’s and especially the human resource.

$ Departmental type projects often get funded entirely within that departments’ annual budget.

$ R&D projects get funded based on a total corporate budget that has been set aside purely for R&D.

To put it another way R&D budgets buy xxx number of bodies to develop new ideas.

$$ Other product related projects are either funded by a must fix-it allocation, budget set-aside funds, or recurring revenue from the sale of products
Things You Will Learn: An Example

Product Development Economics:

- Estimating the cost of moving from a Proposed Design to an Acceptable Design
- Estimating the Manufacturing Costs

The Manufacturing System:

- Raw Materials
- Labor
- Purchased Components
- Equipment
- Information
- Tooling
- Energy
- Supplies
- Services
- Waste
- Finished Goods

Adapted from Product Design and Development fourth edition by Karl T. Ulrich & Steven D Eppinger
Things You Will Learn: Notable Cost Perspectives

Experienced gamesmanship is embarked upon when protecting your turf and your people. It’s who you know and who likes you.

Wil Mercer – Retired Facilities Director for a US based semiconductor enterprise.

As enterprises grow – internal politics can get ugly when it comes to projects and budgets.

Budgets don’t always support the number of people the enterprise has working for you as a manager.

Jack Talbot – retired CPA Financial Analyst

If you underestimate the Near-term – how can you possibly have any confidence in the long term?

Joel M Koppelman Author - Earned Value Project Management
Course Objective

The primary objective of the course is:

to prepare students with the financial and business knowledge **with hands on practice** to fit the role of an Engineering Manager in industry.

Throughout the course students will:

- Learn / refresh their previous knowledge on the key concepts of business strategy, financial management, and project management for alignment with business performance
- Understand how projects work across departments to benefit programs and support portfolios while meeting business financial goals
- Learn “in detail” the key concepts of financial and cost management for functional business departments.
- Understand the cost and cash flow components of projects and the effect on business
- Learn how to manage projects successfully as part of “revenue increasing / cost reducing” business operations
- Learn how to financially manage a small business and subsequently the operations of a department within a corporation by aligning business strategy with the objective of increasing financial revenue
- Understand how to successfully run business lines, including the financial responsibilities as a department manager for a corporation.
- Provide an initial foundation of business financial and cost management in alignment with a global standard (AACE)
GAPs to be filled by Engineering Financial Management

In Supporting Skills and Knowledge:
- Economic Analysis
- Optimization and Models
- Statistics & Probabilities

In Functional Skills and Knowledge:
- Risk Management
- Scope & Schedule Development
- Investment Decision Making
- Project Plan Implementation
- Project Performance Measurement & Assessment using Earned Value Management (EVM)
You should take this course IF...

- Your career objective is to become a manager and you have only engineering background

- You would like to learn the foundations of financial management

- You would like to get a more professional understanding of financial management on projects

- You do not know where to start learning about financials and leading as functional manager
You should take this course IF...

• You are currently an engineer and would like to be promoted to a managerial position in your company, in the near future.

• You have some understanding of engineering economics but you do not know how to analyze, create and operationalize departmental budgets.
You should take this course IF...

• You would like to learn about financial management but do not want to end up counting beans!...

• Your dream career goal is to run your own company one day!... And you would like it to be successful!
You should take this course IF...

- You know project management basics well... but when it comes to finances ... “what is that?” for you.

- You have a novel engineering idea... you would like to start your own company as soon as possible... you would like to make a quick and knowledgable start by learning the basics of financial management.
What students say about EFM

- Great course; very challenging & beneficial for career objectives
- Excellent class and great professor!
- Very engaging course, would take again!
- Liked the books
- I had a great time in the class. It was fun as well as I learned a lot.
- Great Class!!! Real world examples
- Overall course structure and plan is excellent. Excellent class overall.
- This is my last class in the program and I am very glad that I took it.