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 will include:
- Project scope
- Project accounting
- Cost estimation
- Budgeting
- Cost management and earned-value assessments
- Cost-driven optimization techniques.
- Economics underlying project selection and investment strategies.

This course will emphasize a systems engineering perspective and is a core requirement for the IPFW Masters of Science in Engineering systems engineering focus

Credits: 3
Professor: Dr. Steve Walter
Homework: Homework will be assigned weekly.
Evaluation: The course will be graded on a curve.
30% Homework (Homework will be assigned weekly.)
30% First Exam
40% Final Exam (The final exam will be comprehensive.)

Course Outcomes:
A student who successfully completes the course will have demonstrated:
1. Use of a work breakdown structure (WBS) to document project scope.
2. The ability to read and understand project financial reports.
3. An understanding of techniques used to estimate project costs.
4. Knowledge of criteria for developing basis of estimates for project costing.
5. Techniques for quantifying risk.
6. Use of risk in determining cost reserves.
7. Use cost as a criteria in making design and development decisions.
8. Familiarity with EVMS metrics.
9. An understanding of the time value of money.
# Tentative Class Schedule

<table>
<thead>
<tr>
<th>Class</th>
<th>Topic</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1</td>
<td>Course Obj./ Project Scope –WBS/ Intro Cost Est.</td>
<td>Classes Begin</td>
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<tr>
<td>2</td>
<td>Cost Estimation: Methods and Basis of Estimates</td>
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<tr>
<td>3</td>
<td>Cost Allocation/ Cost Pools / Overhead / Accounting</td>
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<td>4</td>
<td>More on Cost Pools and Overhead / Sarbanes-Oxley</td>
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<td>5</td>
<td>Scheduling and Budgeting</td>
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<td>6</td>
<td>Cost Risk and Risk Management</td>
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<td>7</td>
<td>Trade Studies/Decision Trees/Matrices /Exam Review</td>
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<td>8</td>
<td>Value Engineering/Cost as an Independent Variable / Exam</td>
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<td>9</td>
<td>Design to Cost / Cost Reduction Strategies</td>
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<td>10</td>
<td>EVMS and the EV Baseline</td>
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<td>11</td>
<td>Monitoring EV Performance / Nunn-McCurdy - Over runs</td>
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<td>12</td>
<td>Production Economics</td>
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<td>13</td>
<td>Cash Flow and Net Present Value</td>
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<tr>
<td>14</td>
<td>Corporate Valuation and Financial Statements / Exam Review</td>
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**Final Exam**

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**Books:**  

**Textbook:** *Modern Cost Management, 2nd Ed., 2000 (In paperback)*  
Jae K. Shin, Joel G. Siegel, Ph.D.  
Barron’s Educational Series, Inc.  
[http://www.barronseduc.com](http://www.barronseduc.com)

This book will be supplemented by government or professional society guides, which will be called out during the semester. Examples include:

**Work Breakdown Structures**

**Cost Estimating**
• Is “Estimate Accuracy” an Oxymoron?, Mr. Larry R. Dysert CCC, 2006 AACE International Transactions, EST.01.2- EST 01.5.


Basis of Estimates


• Preparing a Basis of Estimate, Mr. Todd Pickett, CCC, 2005 AACE International Transactions, EST.10.2- EST 10.5.

Scheduling


Cost Allocation/Cost Pools/Accounting Structures and Production Economics

• Modern Cost Management, Jae K. Shin, Joel G. Siegel, Ph.D., Barron’s Educational Series, Inc., 2nd Ed., 2000 (In paperback)

Risk Management


Earned Value


• An Introduction to Earned Value Analysis, Suketu Nagrecha, white paper, 2002


• Forecasting Project Schedule Completion With Earned Value Metrics, D. S. (Dave) Jacob, Doren Associates, Undated ~2002