

<b>COURSE NUMBER:</b> <b>IE 2021</b>	<b>COURSE TITLE:</b>  Engineering Economics
<b>TERMS OFFERED:</b> Spring	<b>PREREQUISITES:</b> Math 1371 and 1372
<b>TEXTBOOKS/REQUIRED MATERIAL:</b>  William G. Sullivan, Elin M. Wicks, and C. Patrick Koelling, Engineering Economy, 15th Edition, Prentice Hall, 2012.	<b>PREPARED BY:</b>  Shuzhong Zhang  <b>DATE OF PREPARATION:</b>  October 21, 2011
<b>COURSE LEADER(S):</b>	<b>CLASS/LABORATORY SCHEDULE:</b>   <b>CONTRIBUTION OF COURSE TO MEETING PROFESSIONAL OBJECTIVES:</b>
<b>CATALOG DESCRIPTION:</b>  Cost and design process, cost estimation models, cash flow analysis, interest rate models, time value of money, evaluation of projects, internal rate of return, depreciation and income taxes, price changes and inflation, capital budgeting, decision making under uncertainty.	<b>COURSE TOPICS:</b>  <ol style="list-style-type: none"> <li>1. Concept of costs in engineering design process; estimating and understanding costs.</li> <li>2. Interest rate and time value of money; interest rate formula; application of interest rate formula in the evaluation of projects.</li> <li>3. Comparing alternatives; cash flow diagram; minimum attractive rate of return.</li> <li>4. Evaluation of projects involving depreciation, taxation, and inflation.</li> <li>5. Capital budgeting; risks and uncertainties; benefit-cost ratio analysis; breakeven analysis; sensitivity analysis.</li> </ol>

<p><b>COURSE OBJECTIVES</b></p>	<ol style="list-style-type: none"> <li>1. To help students develop a systematic way to understand the economic aspects of engineering solutions.</li> <li>2. To acquaint students with interest rate related concepts such as present worth, future worth, and internal rate of return.</li> <li>3. To train students to use Excel for interest rate formulas.</li> <li>4. To help students develop methods to evaluate alternative designs by considering notions such as time value of money, economic equivalence, depreciation, inflation, tax, and benefit-cost ratio.</li> <li>5. To introduce students the notion of risks, and develop the methods to incorporate risks in the engineering economic decision making processes.</li> </ol>
<p><b>COURSE OUTCOMES</b></p>	<ol style="list-style-type: none"> <li>1. Students learn to identify and categorize cost items in an engineering design project by using the relevant terminologies and models.</li> <li>2. Students learn to optimize the performance of an engineering design or an engineering system by analyzing its revenue and cost components.</li> <li>3. Students learn the basic methodological tools to make engineering economic decisions.</li> <li>4. Students learn to analyze the economic aspects of engineering decision process, and communicate their findings in a scientific manner.</li> </ol>
<p><b>ASSESSMENT TOOLS:</b></p>	<ol style="list-style-type: none"> <li>1. 1 midterm examination and a final examination.</li> <li>2. Biweekly assignments.</li> </ol>