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| Course unit title: | Engineering Economy | | |
| Course unit code: | ME 305 | | |
| Type of course unit: | Compulsory | | |
| Level of course unit: | Bachelor (2 nd Cycle) | | |
| Year of study: | 3 | | |
| Semester when the unit is delivered: | 6 (Spring) | | |
| Number of ECTS credits allocated : | 6 | | |
| Name of lecturer(s): | Dr. Michalis Menicou | | |
| Learning outcomes of the course unit: | <ol style="list-style-type: none"> 1. Identify the main types of Strategic Engineering Economic decisions: equipment and process selection, equipment replacement, new product introduction and existing product expansion, cost reduction, service improvement. 2. Apply Cash flow diagrams, appropriate interest formulae, and economic equivalence to structure engineering economic decision problems. 3. Calculate economic equivalence for single payment series; equal (uniform) payment series; Linear Gradient series; Geometric gradient series; and Irregular payment series. 4. Appraise engineering project proposals by applying Present worth analysis; or Annual worth analysis; or Rate of return analysis. 5. Apply book depreciation methods and Identify factors inherent to asset depreciation; 6. Distinguish between engineering costs; incremental cash flows; project cash flow statements. 7. Apply methods of investigating project risk: sensitivity analysis, break-even analysis. 8. Apply commercial software to model and develop an actual project's cash flow reports and calculate NPV, IRR ect | | |
| Mode of delivery: | Face-to-face | | |
| Prerequisites: | AMAT 111 | Co-requisites: | None |
| Recommended optional program components: | None | | |
| Course contents: | <ul style="list-style-type: none"> • Introduction to Engineering Economic Decisions: Evolution of large engineering projects: idea generation, design, safety, cost, market demand, and business risk. Types of Strategic Engineering Economic decisions: equipment and process selection, equipment replacement, new product introduction and existing product expansion, cost reduction, service improvement. • Understanding Financial Statements: The Balance Sheet and the Cash Flow Statement. Use Ratios to make business decisions (dept management, liquidity analysis, asset management, profitability analysis and market value analysis. • Time Value of Money: Interest, economic equivalence, Interest formulas for Single Cash Flows, equal payment cash flows, and gradient cash flows (lineal and geometric). • Evaluating Business and Engineering Assets: Present Worth Analysis. Annual Worth Analysis: Make or Buy decisions, Break-even point. Rate of return Analysis: Internal rate of return criterion. • Depreciation: Factors inherent to asset depreciation. Book depreciation methods • Project Cash Flow Analysis: Classification of Costs; Incremental Cash Flows; | | |

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| | <p>and Project Cash Flow Statements.</p> <ul style="list-style-type: none"> • Handling Projects Uncertainty: Methods of describing Project Risk: sensitivity analysis, break-even analysis; Probability concepts, probability distributions; Decision trees diagrams. • Equipment replacement decisions: Replacement strategies for finite/ infinite planning horizons |
| Recommended and/or required reading: | |
| Textbooks: | <ul style="list-style-type: none"> • Fundamentals of engineering Economics, by Park Chan, Prentice Hall, 2nd edition 2009, ISBN: 0-13-135457-4/ ISBN: 978-0-13-135457-9. • Engineering Economy , by William Sullivan, Elin Wicks, and Patrick Koelling, 14th edition, 2009, ISBN: 978-0-13-208342-3/ ISBN: 0-13-208342-6 |
| References: | <ul style="list-style-type: none"> • Engineering Economy, by W. G. Sullivan, E. M. Wicks and J. T. Luxhoj, 12th edition 2003 |
| Planned learning activities and teaching methods: | <p>The taught part of course is delivered to the students by means of lectures, conducted with the help of computer presentations. Lecture notes and presentations are available through the web for students to use in combination with the textbooks.</p> <p>Lectures are supplemented with laboratory work carried out on Microsoft Excel. During laboratory sessions, students learn Engineering Economy functions at Microsoft Excel and develop simple Project Cash flow applications to evaluate critical parameters such as Net Present Worth or Internal Rate of Return of a proposed engineering investment.</p> |
| Assessment methods and criteria: | <ul style="list-style-type: none"> • Laboratory Assignment 12% • Tests 28% • Final Exam 60% |
| Language of instruction: | English |
| Work placement(s): | No |