ANNEX 2 – COURSE DESCRIPTION

Course Title	**Engineering Economics for Automotive Engineers**				
Course Code	**AU210**				
Course Type	**Compulsory**				
Level	**BSc (Level 1)**				
Year / Semester	**2nd year/ 4th semester**				
Teacher's Name	**Dr. Michalis Menicou**				
ECTS	5	Lectures / week	3	Laboratories/week	1
Course Purpose	Any business managers are to be evaluated by the quality of their decisions. The most critical decisions to be taken by engineering managers refer to the purchase of engineering machinery/ equipment, decisions involving long term financial commitment by any engineering company. Within this context, automotive engineering students in this course learn the prevailing engineering economic decisions and the most prominent techniques and tools to structure and gain economic insight. Last but not least, students learn how to use Microsoft Excel functions to structure such problems.				
Learning Outcomes	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				
Prerequisites	AMAT 111		Corequisites	None	
Course Content	• **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; and Project Cash Flow Statements. • **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
Teaching Methodology	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 e-learning facility for students to use in combination with the textbooks. 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.
Bibliography	Textbook: • Fundamentals of engineering Economics, by Park Chan, Prentice Hall, 2nd edition 2009, ISBN: 0-13-135457-4/ ISBN: 978-0-13-135457-9. References: • Engineering Economy , by William Sullivan, Elin Wicks, and Patrick Koelling, 14th edition, 2009, ISBN: 978-0-13-208342-3/ ISBN: 0-13-208342-6 • Engineering Economy, by W. G. Sullivan, E. M. Wicks and J. T. Luxhoj, 12th edition 2003
Assessment	Students will be assessed through: - Two midterm tests at the 6th and 11th weeks of the course. - A Laboratory Test, and - A final test at the end of the semester, in which all material will be

	examined. The weights of the course assessment are as follows: Laboratory Test: 12% Midterm Exams: 28% Final Exams: 60%
Language	English