Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	**Erbil Technology College**	
Department	**Automation Industrial Technology Engineering**	
Module Name	**Engineering Economic**	
Module Code	**ENE606o**	
Degree	**Technical Diploma** ☐ **Bachelor** ☒ **High Diploma** ☐ **Master** ☐ **PhD** ☐	
Semester	**Six**	
Qualification	**MSc Electronic & control Engineering**	
Scientific Title	**Lecturer**	
ECTS (Credits)	**3**	
Module type	**Prerequisite** ☐ **Core** ☒ **Assist.** ☐	
Weekly hours	**2**	
Weekly hours (Theory)	**(2)hr Class**	**(64)Total hrs Workload**
Weekly hours (Practical)	**( )hr Class**	**( )Total hrs Workload**
Number of Weeks	**12**	
Lecturer (Theory)	**Brzo Aziz Qadir**	
E-Mail & Mobile NO.	**Brzo.qadir@epu.edu.iq**	
Lecturer (Practical)		
E-Mail & Mobile NO.		
Websites	**www.Epu.edu.iq**	

Course Book

Course Description	The purpose of this course is to provide engineering students with the required economic knowledge to bid on projects and compare economic alternatives in the workforce; including equivalence, compound interest and discount rate factors, nominal and effective interest rates, cash flow diagrams, basic microeconomics, cost estimation, cost indices, and different alternative comparison methods.
Course objectives	The objective is to help engineering students recognize and understand the importance of cost factors that are inherent in all engineering decisions. Development of ability to handle engineering problems that involve economic factors. The course includes economic environment, selections in present economy, value analysis, critical path economy, interest and money-time relationships, depreciation and valuation, capital financing and budgeting, basic methods for undertaking economic studies, risk, uncertainty and sensitivity, selections between alternatives, fixed, increment, and sunk costs, the effects of income taxes in economic studies, replacement studies, minimum cost formulas, economic studies of public projects, economic studies in public utilities. Effects of inflation are considered at each step. Students cannot obtain credit for both this course and ENGR 4750.
Student's obligation	The presence of students in both lectures and Lab will have additional credit .He /She is required to continuously follow the lectures ,Submits homework and reports .Anticipate Tests or quizzes any time in Class or Lab
Required Learning Materials	Mathematic and English

Evaluation

Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Paper Review				
Assignments	Homework	10		
	Class Activity			
	Report	10		
	Seminar	4		
	Essay			
	Project			
Quiz		10		
Lab.		10		

	Midterm Exam	16		
	Final Exam	40		
	Total			
Specific learning outcome:	**Understand major principles of economic analysis for decision making among alternative courses of action in engineering**. Apply cost estimation and alternative analysis techniques for engineering applications. Demonstrate knowledge of cost estimation techniques and probabilistic risk analysis. 1. The student will use EXCEL spread sheets and financial functions to model and solve engineering economic analysis problems. 2. The student will define and provide examples of the time value of money. 3. The student will demonstrate the effects of depreciation, income taxes, inflation and price change in engineering economic analysis problems. 4. The student will solve economic problems involving comparison and selection of alternatives by using variety of analytical techniques including present worth analysis, annual worth analysis, future 2 worth analysis, rate of return analysis, benefit-cost ratio, sensitivity and breakeven analyses, and payback period analysis			
Course References:	ENGINEERING ECONOMICS by R. Panneerselvam © 2001 by PHI Learning Private Limited, New Delhi. All rights reserved. No part of this book may be reproduced in any form, by mimeograph or any other means, without permission in writing from the publisher. ISBN-978-81-203-1743-7 The export rights of this book are vested solely with the publisher. Thirteenth Printing … … January, 2012 Published by Asoke K. Ghosh, PHI Learning Private Limited, M-97, Connaught Circus, New Delhi-110001 and Printed by Meenakshi Art Printers, Delhi-110006.			

Course topics (Theory)	**Week**	**Learning Outcome**
Cost accounting and time value of money relationships. Analysis of how to calculate the cost of developing and producing products Determining time based cash flow equivalencies Development of financial statements and ratios Using Monte Carlo simulation to optimize engineering design Stock and Bond Valuation	1-4	Define Engineering Economics
Comparing mutually exclusive and independent projects. Development of internal rate of return (IRR) and net present value (NPV) Calculation of break even points and payback periods Construction of a retirement planner using Monte Carlo simulation	5-8	
Including taxes in economy studies. Determination of after tax cash flows, NPV and IRR One variable sensitivity analysis using Excel Impact of debt financing Simultaneous variable sensitivity analysis using Monte Carlo simulation Short-Term Financing and Cash Management	9-10	
Including inflation in economy studies. Adjusting cash flows for the impact of inflation Modeling unknown inflation and interest rates using Monte Carlo simulation Entrepreneurial Case Study	11-12	
Risk and uncertainty. Calculation of expected NPV and IRR Determining the distribution of NPV and IRR using Monte Carlo simulation Capital	13-14	

Asset Pricing Model (CAPM)		

Extra notes:

I will assess the students continuously through their activities in the class. Any student with thoughts about learning, and suggestions of different way of dealing with difficulties and problems will be very welcomed.
Showing relevant Methods, technical videos, and other academic activities are part of the course model.

External Evaluator

General evaluation of course objectives and content.

General evaluation of lectures/ Practical sessions.

General evaluation of lecturer.