Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	Erbil Technical Engineering College	
Department	Highway Engineering Department	
Module Name	Engineering Management and Economy	
Module Code	EME505	
Degree	Technical Diploma [ ] Bachelor [/] High Diploma [ ] Master [ ] PhD [ ]	
Semester	1st	
Qualification	MSc. Construction Management	
Scientific Title	Asst. Lecturer	
ECTS (Credits)	4	
Module type	Prerequisite [ ] Core [/] Assist. [ ]	
Weekly hours		
Weekly hours (Theory)	(4)hr Class	(162)Total hrs Workload
Weekly hours (Practical)	(-)hr Class	(-)Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)	Farah Subhi Hayder	
E-Mail & Mobile NO.	Farah.hayder@epu.edu.iq	
Lecturer (Practical)	-	
E-Mail & Mobile NO.	-	
Websites	-	

Course Book

Course Description	❖ **Engineering Management:** Engineering management is a specialized field of management concerned with the engineering sector. Reflecting industry demand for management-focused engineers (or from the opposite perspective, managers with an understanding of engineering), a growing number of specialized engineering management degrees are available to help develop the knowledge and skills needed for these roles. During an engineering management course, students will develop industrial engineering skills, knowledge and expertise, alongside knowledge of business and management techniques, strategies and concerns. ❖ **Engineering Economy:** The purpose of this course is to give an introduction to economic analysis for decision making in engineering design, manufacturing equipment, and industrial projects. Subjects covered include interest, economic equivalence, time-value of money, project cash-flow analysis, decision making among alternatives, present worth, capitalized cost, equivalent-uniform, rate-of-return, benefit-cost ratio methods, replacement analysis, break-even analysis, sensitivity analysis, capital budgeting, inflation, elements of cost and cost estimation, payback analysis, methods of depreciation, after tax economic analysis, and computer applications in engineering economics.
Course objectives	❖ **Engineering Management:** The better you can work with people, the more successful you will be in both your personal and your professional lives. ▪ Employers want to hire employees who can participate in managing the firm. ▪ Even non-managers (Individual Contributors) are being trained to perform management functions. The study of management builds the skills needed in today's workplace to succeed in: ▪ Becoming a partner in managing your organization through participative management. ▪ Working in a team and sharing in decision making and other management tasks. The study of management also applies directly to your personal life in helping you to: ▪ Communicate with and interact with people every day.

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- Make personal plans and decisions, set goals, prioritize what you will do, and get others to do things for you.

❖ **Engineering Economy:**

Prepare engineering students to analyze cost/revenue data and carry out make economic analyses in the decision making process to justify or reject alternatives/projects on an economic basis.

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<tr><td>Student's obligation</td><td>In this course students must attend all the classes full time with no absence, in case of having an urgent case student allowed to leave the class with direct lecturer permission. The course program contains quizzes, discussion and assignments.</td></tr>
<tr><td>Required Learning Materials</td><td>lectures are going to be presented in the computer lab. with projector for presenting the lectures. Also, white board will be used for demonstrating materials that needs more highlights.</td></tr>
<tr><td>Evaluation</td><td>
<table>
<tr><th colspan="2">Task</th><th>Weight (Marks)</th><th>Due Week</th><th>Relevant Learning Outcome</th></tr>
<tr><td colspan="2">Paper Review</td><td>-</td><td></td><td></td></tr>
<tr><td rowspan="6">Assignments</td><td>Homework</td><td>10</td><td></td><td></td></tr>
<tr><td>Class Activity</td><td>2</td><td></td><td></td></tr>
<tr><td>Report</td><td>-</td><td></td><td></td></tr>
<tr><td>Seminar</td><td>8</td><td></td><td></td></tr>
<tr><td>Essay</td><td>-</td><td></td><td></td></tr>
<tr><td>Project</td><td>8</td><td></td><td></td></tr>
<tr><td colspan="2">Quiz</td><td>8</td><td></td><td></td></tr>
<tr><td colspan="2">Lab.</td><td>-</td><td></td><td></td></tr>
<tr><td colspan="2">Midterm Exam</td><td>24</td><td></td><td></td></tr>
<tr><td colspan="2">Final Exam</td><td>40</td><td></td><td></td></tr>
<tr><td colspan="2">Total</td><td>100</td><td></td><td></td></tr>
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<tr><td>Specific learning outcome:</td><td>

❖ **Engineering Management**

- Demonstrate an understanding of, and apply, the fundamentals of project planning and project management.
- Demonstrate an understanding of Project Management functions, scheduling techniques, Critical path analysis, PERT charts, Gantt charts, uncertainty and Risk management.

❖ **Engineering Economy**

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	▪ Be able to perform and evaluate Present worth, Future worth and Annual worth analyses on one of more economic alternatives. ▪ Be able to perform and evaluate payback period and capitalized cost on one or more economic alternatives. Be able to carry out and evaluate Benefit/Cost, Lifecycle and Breakeven analyses on one or more economic alternatives.
Course References:	➢ Engineering Management Principles and Economic, by Nail M. Fraser; Elizabeth M. Jewkes and Jeffrey K. Pinto. ➢ Engineering Economic Analysis, by Donald G. Newnan; Ted G. Eschenbach and Jerome P. Lavelle. Ninth Edition. ➢ Engineering Project Management, by Nigel J. Smith. Second Edition. A Guide to the Project Management Body of Knowledge, (PMBOK Guide). Fifth Edition.

Course topics (Theory)	**Week**	**Learning Outcome**
Definition, Introduction to general management, Management System.	1	
Main Duties of Engineering Project Manager, Main Engineering Characters required, Job Planning by CPM and Bar Chart.	2	
Job Planning by CPM and Bar Chart.	3	
Resource Allocation, Site Control and Supervision.	4	
Earned Value Management	5	
Earned Value Management	6	
Interest and Time Relationship.	7	
Fixed Increment and Sunk Costs.	8	
Alternative Selection.	9	
Alternative Selection.	10	
Economic Life of Equipment and Structures.	11	

Benefit-Cost Ratio Method.	12	

Practical Topics	**Week**	**Learning Outcome**
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Questions Example Design

Q1//

a- We applied a building project which is for residential uses, How do we know whether the project is successful or not? Explain your answer in detail.
(15 Marks)

b- Define "Dummy Activity" and "Critical Activity" in CPM.
(15 Marks)

Q2//

c- Effective Project Manager require a balance of ethical, interpersonal, and conceptual skills that help them analyse situations and interact appropriately, mention ten of these skills?
(15 Marks)

d- Resource Management is prone to several challenges that you need to be aware of to properly allocate resources and manage them throughout the project, state and discuss those challenges.
(15 Marks)

Q3//

a- You are an engineering manager in a project for executing and constructing condominiums. You have finished and closed the project, but some of the customers are not happy with the result and does not accept the product. What would you as a project manager do?
(10 Marks)

b- For the following table of information,

- Draw the Network Diagram.
  (10 Marks)
- Determine the Critical Path(s).
  (10 Marks)
- Determine the Float for each activity.
  (10 Marks)

Activity	***Successor***	***Duration(days)***
Start Milestone	A,B	-
A	I,F,C	15
B	D,E	9
C	G	12
D	H	10
E	J	29
F	K	12
G	J	37
H	J	48
I	K	12
J	K	6
K	-	6

Extra notes:

External Evaluator

I hereby confirm that all syllabuses given in the attached course modules is sufficient to cover required subjects, areas and titles needed for students regarding this study year.

Ahmed S. Ali

Ahmed Suad Ali

Senior scientific committee member of Highway Engineering Department