



Arab Academy for Science, Technology & Maritime Transport
College of Engineering & Technology
Department of Basic and Applied Sciences

University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: IM 423	Course Title: Operation Research	Academic Year/Level: 4th year / 8th semester	
Specialization: Industrial Engineering	No. of Instructional Units	Lecture	Practical
	3 Credits	2 Hrs.	2 Hrs.

2- Course Aim

Provide students with a knowledge that can make them appreciate the use of various research operations tools in decision making in organizations

3- Intended Learning Outcome (ILO's)

a- Knowledge and Understanding	<p>K5) Methodologies of solving engineering problems, data collection and interpretation</p> <ul style="list-style-type: none"> - Discuss the relationships between different departments in factories. - Define the role of operation management - Explain the techniques used for break even analysis. - Define the elements of good forecast. - Discuss the techniques of forecasting - Discuss the importance of inventory management. - Explain technique to reduce inventory costs. - Discuss the difference between economic order quantity and economic production quantity. - Explain the meaning of quality control - Discuss how to use quality charts
b- Intellectual Skills	<p>I10) Incorporate economic, societal, environmental dimensions and risk management in design.</p> <ul style="list-style-type: none"> - Analyze procedure for the development of new product. - Evaluate optimum quantity for production - Analyze the procedures for making forecast. - Evaluate forecast values using different techniques. - Identify different types of inventory. - Evaluate the economic order quantity. - Evaluate the economic production quantity. - Analyze the use of sampling plans - Evaluate the stability of the process
c- Professional Skills	<p>P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.</p> <ul style="list-style-type: none"> - To formulate a managerial decision problem into a

	mathematical model - To use the simplex method in solving the LP problems - To use the Big M method in solving the LP problems - To model a real case problems to transportation model - To construct resource level charts
d- General Skills	

4- Course Content

Lecture		
Wk	Hrs	
1	2	Introduction to Operations Research
2	2	Introduction to Foundation mathematics and statistics
3	2	Linear Programming (LP), LP and allocation of resources, LP definition, Linearity requirement
4	2	Maximization then Minimization problems.
5	2	Graphical LP Minimization solution
6	2	Introduction, Simplex method definition, formulating the Simplex method
7	2	Exam
8	2	Big M Techniques.
9	2	The Transportation Model
10	2	Optimization methods for transportation problems
11	2	Introduction to Project Management
12	2	Exam
13	2	The Assignment Model: Basic Assumptions.
14	2	Queuing Theory (M/M/1) and (M/M/∞)
15	2	.Revision
16	2	Final Exam

5- Teaching and Learning Methods

<ol style="list-style-type: none"> 1. Lectures 2. Tutorials 3. Individual and group coursework 4. Project group technical reports Individual and group projects

6- Teaching and Learning Methods for Students with Special Needs

<ol style="list-style-type: none"> 1. Consulting with lecturer during office ours 2. Consulting with teaching assistant during office ours Private sessions for redelivering the lecture contents

7- Student Assessment

a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. Continuous assessment (reports, discussions, etc.....) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7 th Week Written Exam Assessment 2: 12 th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16 th Week Final Written Exam
c- Weighing of Assessment:	7 th Week Examination : 30 % 12 th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Semester Work : 10 % Total : 100%

8- List of References:

8- List of References:	Hillier/Lieberman - Introduction to Operations Research - McGraw-Hill
a- Course Notes	No notes
b- Required Books (Textbooks)	Hillier/Lieberman - Introduction to Operations Research - McGraw-Hill
c- Recommended Books	HamdyTahaIntroduction to Operations Research
d- Periodicals, Web Sites, ..., etc.	

Course coordinator:

Program Manager: