



Arab Academy for Science, Technology & Maritime Transport
College of Engineering & Technology
Mechanical Engineering (Mechatronics) Program

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: ME 356	Course Title: Machine Design I	Academic Year/Level: 3rd year / 5th semester	
Specialization: Mechanical	No. of Instructional Units 3 credits	Lecture 2 hrs.	Practical 2 hrs.

2- Course Aim

- To impart an appreciation of basic design considerations.
- To give the students an awareness of the factors effecting design in relation to problems in the mechanical engineering applications

3- Intended Learning Outcomes

a- Knowledge and Understanding	<p>Through knowledge and understanding, students will be able to:</p> <p>K1) Concepts and theories of mathematics and sciences, appropriate to the discipline</p> <p>K3) Characteristics of engineering materials related to the discipline</p> <p>K4) Principles of design including elements design, process and/or a system related to specific disciplines.</p>
b- Intellectual Skills	<p>Through intellectual skills, students will be able to:</p> <p>I6) Investigate the failure of components, systems, and processes.</p> <p>I12) Create systematic and methodic approaches when dealing with new and advancing technology.</p>
c- Professional Skills	<p>Through professional and practical skills, students will be able to:</p> <p>P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, Products and/or services</p> <p>P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs</p> <p>P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results</p> <p>P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.</p>
d- General Skills	<p>Through general and transferable skills, students will be able to:</p> <p>G7) Search for information and engage in life-long self learning discipline</p> <p>G9) Refer to relevant literature</p>

4- Course Content

Week No.1	Introduction
Week No.2	Stress in machine parts
Week No.3	Stress, material selection and factor of safety
Week No.4	Applications to design of machine elements
Week No.5	Introduction to fatigue in metals.
Week No.6	Stress concentration and design of members subject to fatigue loading
Week No.7	Power screws types and applications / 7th week evaluation
Week No.8	Bolted joints, brackets, and pressure vessel
Week No.9	Welded and adhesive joints
Week No.10	Welded joints specifications
Week No.11	Spring types and applications – helical compression springs
Week No.12	Design of different of springs / 12th week evaluation
Week No.13	Miscellaneous design problem.
Week No.14	Miscellaneous design problem
Week No.15	Miscellaneous design problem
Week No.16	Final Examination

5- Teaching and Learning Methods

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

6-Teaching and Learning Methods for Students with Special Needs

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars <p>Academic Support:</p> <ul style="list-style-type: none"> • The general academic advisor appoints an academic supervisor for handicapped students. • Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes.	
	2-Class Activities (Reports, Discussions, -----) to assess The Intellectual and general Skills.	
b- Schedule:	Assessment 1	7 th Week Assessment
	Assessment 2	12 th Week Assessment
	Assessment 3	Continuous Assessments
	Assessment 4	16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Evaluation	30 %
	12 th Week Evaluation	20 %
	Final-term Examination	40 %
	Oral Examination	00 %
	Practical Examination	00 %
	Semester Work	10 %
	Total	100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• Shigley & Mischke, “Mechanical Engineering Design”, latest Edition, McGraw – Hill Book.
c- Recommended Books	• Paul H. Black, “Machine Design”, Latest edition, McGraw – Hill co. A.D. Deutschman, “Machine Design”, latest Edition, Macmillan Publishing Co., Inc.
d- Periodicals, Web Sites, etc.	N/A

Course coordinator:

Program Manager: