



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: <b>ME 357</b>	Course Title: <b>Machine Design II</b>	Academic Year/Level: <b>3rd year / 6th semester</b>
Specialization: <b>Mechanical</b>	No. of Instructional Units <b>3 credits</b>	Lecture <input type="checkbox"/> hrs.
		Practical <input type="checkbox"/> hrs.

**2- Course Aim**

As a continuation to the course of machine design (1), the aim is to provide sufficient and advanced understanding of machine design concept.

**3- Intended Learning Outcomes**

<b>a- Knowledge and Understanding</b>	<p><b>Through knowledge and understanding, students will be able to:</b></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> <p>K10) Technical language and report writing</p>
<b>b- Intellectual Skills</b>	<p><b>Through intellectual skills, students will be able to:</b></p> <p>I5) Assess and evaluate the characteristics and performance of components, systems and processes</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>
<b>c- Professional Skills</b>	<p><b>Through professional and practical skills, students will be able to:</b></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> <p>P12) Prepare and present technical reports</p>

<b>d- General Skills</b>	<p><b>Through general and transferable skills, students will be able to:</b></p> <p>G1) Collaborate effectively within multidisciplinary team.</p> <p>G2) Work in stressful environment and within constraints.</p> <p>G7) Search for information and engage in life-long self learning discipline</p> <p>G9) Refer to relevant literature</p>
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**4- Course Content**

<b>Week No.1</b>	Power transmission systems, Specifications of differed types of belts (belt selection)
<b>Week No.2</b>	Belt selection (contd.), chains, types and selection
<b>Week No.3</b>	Wire ropes selection
<b>Week No.4</b>	Gear types and spur gear force analysis
<b>Week No.5</b>	Design of spur gears
<b>Week No.6</b>	Helical gear force analysis
<b>Week No.7</b>	Bevel and Worm Gears / 7th week evaluation
<b>Week No.8</b>	Introduction to Anti-Friction Bearings
<b>Week No.9</b>	Selection of Ball and Roller Bearings
<b>Week No.10</b>	Introduction to sliding bearings
<b>Week No.11</b>	Design and Selection of Sliding Bearings
<b>Week No.12</b>	Design of shafts based on strength and rigidity / 12th week evaluation
<b>Week No.13</b>	Design of shafts based on strength and rigidity.
<b>Week No.14</b>	Clutches and Brakes
<b>Week No.15</b>	Clutches and Brakes (contd.)
<b>Week No.16</b>	Final Examination

**5- Teaching and Learning Methods**

<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Tutorials</li> <li>• Reports &amp; sheets</li> <li>• Laboratories</li> <li>• Seminars</li> </ul>
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**6-Teaching and Learning Methods for Students with Special Needs**

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

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

**8- List of References:**

<b>a- Course Notes</b>	N/A
<b>b- Required Books (Textbooks)</b>	• Shigley & Mischke “Mechanical Engineering design” , McGraw Hill, latest edition.
<b>c- Recommended Books</b>	• Deutschman “Machine design “, Macmillan, latest edition. Black & Adams “Machine design”, McGraw Hill, latest edition
<b>d- Periodicals, Web Sites, etc.</b>	N/A

Course coordinator:

Program Manager: