



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 464</b>	Course Title: <b>Hydraulic and Pneumatic Systems</b>	Academic Year/Level: <b>4<sup>th</sup> year / 7<sup>th</sup> semester</b>	
Specialization: <b>Mechanical</b>	No. of Instructional Units <b>3 credits</b>	Lecture <b>2 hrs.</b>	Practical <b>2 hrs.</b>

**3- Course Aim**

The student will acquire deep understanding of the theoretical methods and practical techniques in the area of hydraulic power systems

**3- Intended Learning Outcomes**

<b>r- Knowledge and Understanding</b>	<p><b>Through knowledge and understanding, students will be able to:</b></p> <p>K4) Principles of design including elements design, process and/or a system related to specific disciplines.</p> <p>K7) Business and management principles relevant to engineering.</p>
<b>s- Intellectual Skills</b>	<p><b>Through intellectual skills, students will be able to:</b></p> <p>I3) Think in a creative and innovative way in problem solving and design</p> <p>I5) Assess and evaluate the characteristics and performance of components, systems and processes</p>
<b>t- Professional Skills</b>	<p><b>Through professional and practical skills, students will be able to:</b></p> <p>P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs</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>
<b>u- General Skills</b>	<p><b>Through general and transferable skills, students will be able to:</b></p> <p>G7) Search for information and engage in life-long self learning discipline.</p>

**4- Course Content**

<b>Week No.1</b>	Introduction to Fluid Power Systems
<b>Week No.2</b>	Hydraulic Fluids and Transmission Lines
<b>Week No.3</b>	Hydraulic Fluids and Transmission Lines (cont.)
<b>Week No.4</b>	Hydraulic Pumps
<b>Week No.5</b>	Hydraulic Pumps (cont.)
<b>Week No.6</b>	Hydraulic Pumps (cont.)
<b>Week No.7</b>	Fluid Power Actuators (Cylinders, Rotary Actuators, Motors) / 7th week evaluation
<b>Week No.8</b>	Fluid Power Actuators (Cylinders, Rotary Actuators, Motors) (cont.)
<b>Week No.9</b>	Control Components of Hydraulic Systems
<b>Week No.10</b>	Control Components of Hydraulic Systems (cont.)
<b>Week No.11</b>	Control Components of Hydraulic Systems (cont.)
<b>Week No.12</b>	Accumulators and Pressure Intensifiers / 12th week evaluation / 12th week evaluation
<b>Week No.13</b>	Hydraulic Circuit Design and Analysis.
<b>Week No.14</b>	Hydraulic Circuit Design and Analysis (cont.)
<b>Week No.15</b>	Hydraulic Circuit Design and Analysis (cont.)
<b>Week No.16</b>	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"> <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>	• Anthony Esposito, “Fluid Power”, Prentice-Hall International, Latest Edition.
<b>c- Recommended Books</b>	• J MJ Pinches & JG Ashby, “Power Hydraulics”, Prentice Hall, 1989, 1st edition. • Frank Yeaple, “Fluid Power Design Handbook”, Marcel Dekker Inc, 1996, 3rd edition. •
<b>d- Periodicals, Web Sites, etc.</b>	N/A

**Course coordinator:**

**Program Manager:**