



Arab Academy for Science, Technology & Maritime Transport  
College of Engineering & Technology  
Department of Computer Engineering

**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>CC 442</b>	Course Title: <b>Digital Design and Introduction to Microprocessor</b>	Academic Year/Level: <b>3<sup>th</sup> year / 6<sup>th</sup> semester</b>
Specialization:	No. of Instructional Units <b>3 Credits</b>	Lecture <b>2 Hrs.</b>
		Practical <b>2 Hrs.</b>

**2- Course Aim**

To develop engineering skills in the design and analysis of digital logic circuits with applications to digital computer and microprocessors.

**3- Intended Learning Outcome**

<b>b- Intellectual Skills</b>	<ul style="list-style-type: none"> <li>Construct analysis and simplify combinational logic circuits (I5).</li> <li>Demonstrate and analysis sequential logic circuits (I13, I16).</li> </ul>
<b>c- Professional Skills</b>	<ul style="list-style-type: none"> <li>Develop a skill for appropriate use of lab equipment's and tools to design digital combinational circuits (P3, P5,P9).</li> <li>Configure, operate, and debug an experimental set-up using standard lab equipment (P1, P8,P9).</li> <li>Decompose a system into components. (P3).</li> </ul>
<b>d- General Skills</b>	<ul style="list-style-type: none"> <li>Choose the necessary components to design a Requested logic circuit (G5).</li> </ul>
<b>4- Course Content</b>	<p><b>Week 1.</b> Introduction to digital concepts.  <b>Week 2.</b> Number system, operation, and codes.  <b>Week 3.</b> Logic gates.  <b>Week 4.</b> Boolean algebra and logic simplification – part 1.  <b>Week 5.</b> Boolean algebra and logic simplification – part 2.  <b>Week 6.</b> Function of combinational logic.  <b>Week 7.</b> 7th week exam.  <b>Week 8.</b> Decoders, Encoders, MUX, and DMUX – part 1.  <b>Week 9.</b> Decoders, Encoders, MUX, and DMUX – part 2.  <b>Week 10.</b> Flip-flops and related devices – part 1.  <b>Week 11.</b> Flip-flops and related devices – part 2.  <b>Week 12.</b> 12th Week Exam.  <b>Week 13.</b> Shift register.  <b>Week 14.</b> Introduction to microprocessor – part 1.  <b>Week 15.</b> Introduction to microprocessor – part 2.</p>

**5- Teaching and Learning Methods**

- Lectures, tutorials and reading material

**6- Teaching and Learning Methods for Students with Special Needs**

Personalized teaching is available for special needs students and an academic advisor is appointed to follow up with these students and to monitor progress.

**7- Student Assessment**

<b>a-Procedures used</b>	Written Exams (7th and 12th) Final Exam Class Work														
<b>b- Schedule:</b>	Written Exams (7th and 12th week) Final Exam (16th week) Class work (continuous assessment)														
<b>c- Weighing of Assessment</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">7<sup>th</sup> Week Examination</td> <td style="text-align: right;">30 %</td> </tr> <tr> <td>12<sup>th</sup> Week Examination</td> <td style="text-align: right;">20 %</td> </tr> <tr> <td>Final-term Examination</td> <td style="text-align: right;">40 %</td> </tr> <tr> <td>Oral Examination</td> <td style="text-align: right;">00 %</td> </tr> <tr> <td>Practical Examination</td> <td style="text-align: right;">00 %</td> </tr> <tr> <td>Semester Work</td> <td style="text-align: right;">10 %</td> </tr> <tr> <td><b>Total</b></td> <td style="text-align: right;"><b>100%</b></td> </tr> </table>	7 <sup>th</sup> Week Examination	30 %	12 <sup>th</sup> Week Examination	20 %	Final-term Examination	40 %	Oral Examination	00 %	Practical Examination	00 %	Semester Work	10 %	<b>Total</b>	<b>100%</b>
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Practical Examination	00 %														
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<b>Total</b>	<b>100%</b>														

**8- List of References:**

<ul style="list-style-type: none"> <li>▪ M. Mano, “Digital Design”, Prentice Hall, latest edition.</li> <li>▪ John Crisp, “Introduction to Microprocessors and Microcontrollers”, Newnes, latest edition.</li> <li>▪ John F. Wakerly, “Digital Design Principles and Practices”, Prentice Hall, latest edition.</li> </ul>	
<b>a- Course Notes</b>	N/A
<b>b- Required Books (Textbooks)</b>	Thomas L. Floyd, “Digital Fundamentals”, Prentice Hall, latest edition.
<b>c- Recommended Books</b>	N/A
<b>d- Periodicals, Web Sites, ..., etc.</b>	N/A

**Course coordinator:**

**Program Manager:**