

<b>SEMESTER</b> <i>Fifth</i>	<b>DEPARTMENT</b> <i>Control Engineering</i>	<b>COURSE TITLE</b> <i>Digital Electronics II</i>
<b>COURSE CODE</b> <i>ET507</i>	<b>HOURS : 3</b> <b>UNITS : 3</b>	<b>COURSE SPECIFICATIONS</b> <i>Theoretical Content</i>
<p><b>1. Medium Scale Integration (MSI) components:</b></p> <ul style="list-style-type: none"> <li>➤ Binary adder and subtractor. <ul style="list-style-type: none"> <li>• The principles of operation of half adder and full adder.</li> <li>• Explain the construction of 4-bit parallel adder.</li> <li>• The principles of operation of BCD adder and binary subtractor.</li> </ul> </li> <li>➤ Magnitude comparator. <ul style="list-style-type: none"> <li>• Explain the concept of 2bit, 3bit, and 4 bit magnitude comparators.</li> </ul> </li> <li>➤ Decoders and Encoders. <ul style="list-style-type: none"> <li>• Implementing Functions with decoders.</li> </ul> </li> <li>➤ Multiplexers and Demultiplexers. <ul style="list-style-type: none"> <li>• Implementing Functions with multiplexers.</li> </ul> </li> </ul>		
<p><b>2. Programmable Logic Device (PLD) components:</b></p> <ul style="list-style-type: none"> <li>➤ Programmable Logic Array (PLA).</li> <li>➤ Programmable Array Logic (PAL).</li> </ul>		
<p><b>3. The Memory Unit:</b></p> <ul style="list-style-type: none"> <li>➤ The principles of the memory and distinguish between the various types of memory, random access and read only memory.</li> <li>➤ Memory decoding.</li> <li>➤ Random-Access Memory (RAM).</li> </ul>		
<p><b>4. Timing and switching circuits:</b></p> <ul style="list-style-type: none"> <li>➤ Multivibrators, types (Astable, Bistable, and Monostable), operations, and IC specifications.</li> <li>➤ 555 timers as Astable and Monostable Multivibrator.</li> <li>➤ 555 timer applications.</li> </ul>		

**5. Digital to Analog (D/A) and Analog to Digital (A/D) converters:**

- Weighted resistor D/A and the R-2R ladder D/A.
- Ramp type A/D, successive approximation A/D and flash A/D.
- Applications for the above types of A/D. To distinguish between various types of IC D/A and A/D converters.
- To identify key D/A and A/D IC characteristics from their data sheets.

**References:**

1. Thomas P. Sitterlen and Vartan Vartanian, *Digital Electronics with Engineering Applications*, Prentice Hall.
2. Fred Hilsenrath and Bill Pierce, *Digital Logic Circuits and Systems*, Delmar Publishers Inc.
3. Ronald J. Tocci and Lester P. Laskowski, *Microprocessor and Microcomputers, Hardware and Software*, Prentice Hall.