

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

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.