Course code	Course Title	C	H	I	E	T
17U3PAC3/ 17U3PAC1	Digital electronics and communication	1	2	25	75	100

Unit 1   Number systems and logic gates

Number systems – Binary – Octal – Hexadecimal – Conversions – Codes – Gray – ASCII Excess3 code – Gates – OR , NOT, AND, NAND, NOR, Ex–OR.

Unit 2   Laws related to digital electronics

De Morgan's theorem and proof – Universal gates – Boolean laws – K-map simplifications – SOP – Implementing the simplified equation.

Unit 3   Digital circuits

Binary arithmetic – 1's Complement, 2's Complement – Addition & subtraction (unsigned numbers only) – Half adder – Full adder – Multiplexers – De multiplexers – Decoders – Encoders – BCD to decimal decoders – Decimal to BCD encoder.

Unit 4   Flip-Flops

Flip–flops – RS, D (Using NAND gates), JK Flip flop – JK master - slave – Four bit shift register (serial in–serial out) – Working with waveforms.

Unit 5   Communication

Introduction – Need for modulation – Modulation – Methods of modulation – Amplitude modulation (AM) – Percent modulation – Upper and lower side frequencies – Upper and lower sidebands – Mathematical analysis of a modulated carrier wave – Power relations in an AM wave – Frequency modulation – Modulation index – Deviation ratio – Percent modulation.

Text Book(s):

1. Donald P. Leach, Albert Paul Malvino and Goutham Saha, Digital principles and Applications, VI Edn., 2002, TATA McGraw–Hill Publishing Company Limited, New Delhi.
   Unit 1: Chapter 5, Sections 5.1–5.8
   Unit 2: Chapter 2, Sections 2.1, 2.2; Chapter 3, Sections 3.1, 3.2, 3.3, 3.4, 3.5.
   Unit 3: Chapter 4, Sections 4.1, 4.2, 4.3, 4.4, 4.5, 4.6; Chapter 6, Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7
   Unit 4: Chapter 8, Sections 8.1, 8.4, 8.5, 8.7.; Chapter 9, Sections 9.1, 9.2.
2. B.L. Theraja, Basic electronics, (Reprint 2008), S. Chand & Co, New Delhi.
   Unit 5: Chapter 30, Sections 30.1, 30.5, 30.7–30.14, 30.20, 30.22–30.24.

References:

1. S. Manoharan, Digital Principles and system design, Revised edition, May 2013, Charulatha Publications.