Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NPHC504	ELECTRONICS	3	0	0	3

Course Objectives
• To introduce students with the basic and advanced electronic circuits and devices; • To teach the fundamental principles of analog and digital electronics.
Learning Outcomes
Upon completion a student will: • Able to analyze the analog and digital circuits used in various devices. • Able to design and explain the principles of various analog and digital electronics circuits.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Number systems, Basic logic gates, Universal gates, Boolean Algebra, De Morgan's laws, Karnaugh map, Arithmetic circuits	4	This unit will explain aboutthe basics of fundamental digital electronic circuits.
2	Flip-Flops, Registers, Counters, A/D and D/A conversion, Multiplexer, Demultiplexer.	8	Students will learn the advanced digital logic circuits.
3	Network theorems, p-n junction diodes, BJT/JFET devices and their characteristics, Transistor as a switch, Schottky diodes, MOSFET.	7	Familiarize with working principles of various semiconductor devices.
4	Ideal amplifier, Feedback theory, Oscillators. Multivibrators, 555 timer based circuits.	7	Students will learn about the amplifiers, implementation of feedback theory, and multivibrator circuits.
5	Differential amplifier, operational amplifier, Op-amp as adder, subtractor, differentiators, integrators, logarithmic amplifier, Active filters, Applications of op-amp.	5	Familiarize with fundamental of differential and Op-amps and its applications.
6	Amplitude and Frequency modulation, Demodulation techniques, Pulse communication, Digital communication, frequency and time division multiplexing.	5	Students will learn about different communication technologies.
7	Semiconductor Memories, Basics of Microprocessors and Microcontrollers, Internet of Things (IoT), Introduction to Arduino and Raspberry Pi	6	This unit will elucidate the basics of ICs & microprocessors with special emphasis on miniaturization technology, IoT and introduction to Arduino and Raspberry Pi.
	Total	**42**	

Text Books:

1. Millman's Electronic Devices and Circuits; Millman; Tata Mgraw Hill; 2007.
2. Digital Principles and Applications: Leach and Malvino; Tata Mgraw Hill; 2006.
3. Semiconductor Devices: Physics and Technology: S.M. Sze (John Wiley), 2007.
4. Electronic Devices and Circuits (SIE); Cathey; McGraw-Hill Education (India) Ltd; 2008.

Reference Books:

1. Electronic Device and Circuit Theory, R.L. Boylestad and, L. Nashelsky, Pearson 2013.
2. Integrated Electronics: Millman and Halkias (Tata McGraw Hill) 2010.
3. Microelectronics: Millman and Grabel (Tata McGraw Hill), 1999.
4. Electronic Devices and Circuits; Gupta; S. K. Katariaand Sons; 2010.
5. Electronic Fundamentals and Applications: Int. and Discrete Systems; Ryder; PHI Learning; 2009.
6. Hand Book of Electronics; Gupta and Kumar; Pragati Prakashan; 2010.
7. Electronics: Fundamentals and Applications; Chattopadhyay and Rakshit; New Age Internl.; 2010.