LECTURE PLAN (MONSOON) 2024-2025

Course Type	Course Code	Name of Course	L	Т	Р	Credit
DC	NPHC504	ELECTRONICS	3	0	0	3

Course Objective

The objective of the course is

- 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 successful completion of this course, students 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	Introduction to the subject		Familiarize about the subject and the evaluation procedure
2	Number systems, Basic logic gates, Universal gates, Boolean Algebra, De Morgan's laws, Karnaugh map, Arithmetic circuits		Familiarize with basics of fundamental digital electronic circuit.
3	Flip-Flops, Registers, Synchronous, Asynchronous, Counters, A/D and D/A conversion, Multiplexer, Demultiplexer.		Familiarize with the advanced digital logic circuits
4	Network theorems, p-n junction diodes, BJT/JFET devices and their characteristics, Transistor as a switch, Schottky diodes, Homo and Heterojunction devices.		Familiarize with working principles of various semiconductor devices.
5	Ideal amplifier, Feedback theory, Oscillators	5	Familiarize about the amplifiers and implementation of feedback theory
6	Differential amplifier, transfer characteristics, operational amplifier, frequency response	3	Familiarize with fundamental of differential and Op-amps
7	Op-amp as adder, subtractor, differentiators, integrators, logarithmic amplifier, Active filters, Applications of op-amp, Solution of differential equations.	5	Familiarize with the applications of Op-amps
8	Multivibrators, 555 timer based circuits.	1	Familiarize with the multivibrator circuits
9	Amplitude and Frequency modulation, Demodulation techniques, Bandwidth requirements, Pulse communication, Digital communication, frequency and time division multiplexing.	4	Familiarize This unit is about modern communication technologies
10	Digital logic families, Basic concepts of Integrated Circuits, Semiconductor Memories, Basics of Microprocessors and Microcontrollers.		Familiarize about basics of ICs and microprocessors with special emphasis on miniaturization technology
11	Internet of Things (IoT), Introduction to Arduino and Raspberry Pi	2**	Familiarize about IoT and introduction to Arduino and Raspberry Pi

**Optional Online Class

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.

Lecture time:

WEDNESDAY : 10.00 am - 10.50 am THURSDAY : 10.00 am - 10.50 am FRIDAY : 09.00 am - 09.50 am

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Teaching Assistant	
NIL	

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- 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.

Evaluation plan and Subject weightage

- The total marks after final evaluation will be 100 which have a subject weightage of 48 marks (End Sem) + 32 marks (Mid Sem) + 20 marks (2 quizzes).
- There will be two quizzes. Each one will be of 30 minutes duration and the marks obtained will be proportionately converted for a maximum 10 marks each.
- There will be no make-up exams for Quizzes, if missed.
- The Mid semester question paper will be of 60 marks and 2 hours duration. The End semester question paper will be of 100 marks and 3 hours duration.

Date of Quizzes

1. Quiz – I : 5 September 2024 2. Quiz – II : 8 November 2024