Fundamentals of Electronics Engineering

1.1 Course Number: ECE102

1.2 Contact Hours 3-1-2 Credits: 13

1.3 Semester-offered: Both (odd/even)

1.4 Prerequisite: Not required

1.5 Syllabus Committee Member: Dr. Umakant Dhar Dwivedi, Dr. Sajal Agarwal, Dr. Abhishek Kumar Singh, Dr. Shivanshu Shrivastava, Dr. Ravi Shaw

2. **Objective:** To introduce the students to the basics of both theoretical and practical aspects of broader area of Electronics Engineering

3. **Course Content:**

Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topic	Lectures
1	Circuit analysis	Circuit analysis techniques: nodal, mesh, superposition, Thevenins, and Nortons theorems; Transient analysis of capacitive and inductive circuits; Sinusoidal steady state analysis of circuits containing resistors, capacitors, and inductors; Transfer functions	12
2	Semiconductor physics and components	Semiconductors; Diodes and diode circuits; BJT, MOSFETs and amplifiers; IC fabrication; Operational amplifier circuits and waveform generators	12
3	Digital combinational circuit	Number system, logic gates, logic minimization, combinational circuits	8
4	Digital sequential circuit	Field programmable gate arrays (FPGAs); Flipflops, sequential circuits, counters, shift registers; data converters (DAC, ADC)	8
		Total	**40**

4. **Readings**

4.1 Textbook:

1. Charles K. Alexander, Matthew N.O. Sadiku, Fundamentals of electric circuits, McGraw-Hill, 5th Edition 2013
2. S. Sedra and K. C. Smith, Microelectronic Circuits, Oxford University Press , 6th edition
3. M. Moris Mano, `Digital Design', PEARSON, 5th edition 2013.
4. Boylestad, Robert L., Louis Nashelsky, Electronic Devices and Circuit, Pearson , 11th edition

4.2 Reference books:

1. E. Hughes, Electrical and Electronic Technology, PEARSON, 2010

2. William H. Hayt , Jack Kemmerly , Steven M. Durbin, Engineering Circuit Analysis, McGraw-
Hill , 8th Edition 2013
3. David. A. Bell, Electronic Devices and Circuits:, Oxford University Press, 5th Edn. , 5th edition
4. Leach, Malvino, Saha, Digital Principles and Applications, McGraw Hill Education , 8th edition

5. **Outcome of the Course:** The student will learn about fundamentals of Electronics Engineering. They will also be able to learn and use circuit analysis techniques.