Semester 6 Minor
Course- 364T
(Minor Course – 2 Credits)

Semester: 6	**Course No.: 364(T)**	**Course Code:** PHE 364(T) **Course Title – Special theory of relativity- Electronics**
Credits: 2	1 Session = 1 hour	**Course Category: Minor Paper**

Course Objective:

To study the fundamental concepts of special theory of relativity and the effect of relative motion on observations. To examine the effect of different biasing circuit on the stability of transistor operation. Also to understand the different types of number system with conversion between them.

Course Outcomes: On successful completion of the course the learner will be able to

CO	COURSE OUTCOMES	Bloom's Verb
CO-1	Understanding the foundational principles of relativity, applying mathematical transformations, and analysing the impact of motion on measurements of space and time.	**Understand** **Apply** **Analyze**
CO-2	Thoroughly understand the stability of transistor circuits using different types of biasing configurations. Grasped the in-depth knowledge of number systems and codes with numerous examples.	**Understand** **Apply** **Analyze**

Unit No.	Unit Contents	Sessions Allotted
1	**Special Theory of Relativity:** Relativity: Postulates of Special Relativity, Time Dilation, Doppler Effect, Length Contraction, Twin Paradox, Electricity and Magnetism, Relativity of mass, Mass and Energy, Massless Particles, Lorentz Transformation, Velocity addition, Michelson-Morley Experiment.	**15 Hours**
2	**Transistor Circuits** Transistor Biasing**,** Factors contributing to thermal stability, effect of temperature increase, stability factor S, common base stability, collector to base bias, disadvantage of collector to base bias, emitter bias, voltage divider bias with emitter bias, emitter bypass capacitor, summary of stabilization circuit, additional stability factors, bias compensation **Number system:** Binary number system, Binary to decimal conversion , decimal to binary conversion, Hexadecimal numbers, ASCII codes, The Excess 3 code, Gray code	**15 Hours**

Unit-1 Special Theory of Relativity:

Text book: Concepts of Modern Physics by Arthur Beiser, 4th edition, McGraw Hill Pub. Co. Chapter 1: Articles Nos.: 1.1 to 1.11, Appendix – I

Reference book: Engineering physics by R. K. Gaur and S L Gupta. Dhanapatrai publication, New Delhi (2014)

Unit -2 Transistor Circuits

Text book: Electronics Devices and Circuits By Allen Mottershed , PHI Chapter-12 -Article no. 12.1 to 12.12, Chapter-14--Article Nos 14.1 to 14.10

Digital principle and Application By Malvino, Leach and Saha (6th edition) Chapter-5-Article no. 5.1 To 5.3, 5.5 to 5.8

Reference book: Electronic Principles (7th Edition) by A. Malvino & D.J. Bates, TMcGHill Pub.

Electronic Devices and Circuit Theory (8th Edition) by Robert Boylestad and L. Nashelsky, PHI

Fundamentals of Digital Circuits by A. Anandkumar, PHI (2nd Edition)