Semester: 1	**Course No.: 114 (T)**	**Course Code: :** PHMDC 114(T) **Course Title: :** Laser and Plasma Physics
Credits: 2		**Course Category: Multidisciplinary**

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

CO#	COGNITIVE ABILITIES	COURSE OUTCOMES
CO111 T-1	REMEMBERING	Overview of some basic theories related to the subject and study of fundamental concepts in Laser and Plasma physics
CO111 T-2	UNDERSTANDING	Understanding essential to study Lasers and Plasma Physics will be developed .
CO111 T-3	APPLYING	Ability to apply concepts of physics in science engineering and technology will be developed that will strengthen student's analytical abilities .
CO111 T-4	ANALYSING	
CO101.5	EVALUATING	

Unit No.	Unit Contents	Sessions Allotted
1	LASERS Introduction, Attenuation of light in an optical medium, Thermal equilibrium, Interaction of light with matter, Einstein coefficients and their relations, Light amplification, Meeting the three requirements, Components of Laser, Lasing action, Principal pumping schemes, Type of lasers (excluding Carbon Dioxide Laser), Ruby laser ,Nd-YAG lase,He-Ne laser and Semiconductor laser, Laser beam characteristics, Applications	**15**
2	Unit-2 Plasma Physics: Introduction, Composition & characteristics of a plasma, Collisions, Surface phenomena, Transport (or transfer) phenomena, Diffusion & Mobility : Ambipolar Diffusion, Viscosity : Conductivity, Recombination, Ohm's law, Gas Discharge, Comparison of various natural & man-made plasma, Plasma diagnostics, plasma waves & Instabilities confinement of plasma, space plasma.	**15**

Suggested text Books:

1. A text book of Optics by N. Subrahmanyam, Brijlal and M. N. Avadhanulu, S. Chand Publication: Chapter 22, articles 22.1 to 22.12.1, 22.16.1 ,22.16.2,22.16.3 ,22.17. 23rd edition , 2006 , S. Chand and company Ltd.
2. Element of Plasma physics by S. N. Goswami, , chapter 1 , articles 1.1 to 1.14 , 1st edition 1995 , New Central Book Agency (P) Ltd.

Reference Books:

1. Optics by Ajoy Ghatak, 7th Edition , 2020 , McGraw Hill

2 Introduction to Plasma Physics and controlled fusion, F. F Chen , second edition ,1984 , Springer Science