Lecture Plan for Laser Systems & Applications (IEME-014)

Faculty : Shrish Bajpai

Section : Second Year (Mechanical Engineering)

Web Page : http://sbajpai.yolasite.com/laser-systems-and-applications.php

Lecture	Topic	Reference Book
1.	Introduction to the course & application of laser technology in mechanical engineering	1 & 2
2.	Quantum Physics-I	1 & 2
3.	Quantum Physics-II	1 & 2
4.	Schrodinger Equation-I	1 & 2
5.	Schrodinger Equation-II	1 & 2
6.	Concept of coherence & absorption with it's mathematical expressions	1 & 2
7.	Spontaneous emission & stimulated emission processes of laser	1 & 2
8.	Relationship between Einstein's A and B coefficients with it's mathematical derivations	1 & 2
9.	Population inversion process of laser	1 & 2
10.	Pumping and gain of laser & different optical cavities	1 & 2
11.	Mathematical problem related to Unit-I & Unit-II	1 & 2
12.	Mathematical problem related to Unit-I & Unit-II	1 & 2
13.	Mathematical problem related to Unit-I & Unit-II	1 & 2
14.	Mathematical problem related to Unit-I & Unit-II	1 & 2
15.	Mathematical problem related to Unit-I & Unit-II	1 & 2
16.	Mathematical problem related to Unit-I & Unit-II	1 & 2
17.	Components of Laser System	1 & 2
18.	Principle of Laser action with it's mathematical expression-I	1 & 2
19.	Principle of Laser action with it's mathematical expression-II	1 & 2
20.	General lasers and their types-I	1 & 2
21.	General lasers and their types-II	1 & 2
22.	Three & four level Lasers	1 & 2
23.	CW & Pulsed Lasers	1 & 2
24.	Different type of Laser system-I	1 & 2
25.	Different type of Laser system-II	1 & 2
26.	Different type of Laser system-III	1 & 2
27.	Short pulse generation and it's measurement	1 & 2
28.	Mathematical problem related to Unit-III & Unit-IV	1 & 2
29.	Mathematical problem related to Unit-III & Unit-IV	1 & 2
30.	Mathematical problem related to Unit-III & Unit-IV	1 & 2

31.	Mathematical problem related to Unit-III & Unit-IV	1 & 2
32.	Mathematical problem related to Unit-III & Unit-IV	1 & 2
33.	Laser applications in medicine	1 & 2
34.	Laser applications in surgery	1 & 2
35.	Laser applications in materials processing-I	1 & 2
36.	Laser applications in materials processing-II	1 & 2
37.	Laser applications in optical communication	1 & 2
38.	Laser applications in metrology	1 & 2
39.	Laser applications in LIDAR	1 & 2
40.	Laser applications in holography	1 & 2

Text & Reference Books:

1. K.R. Nambiar, “Laser Principles, Types and Application” New Age International.

2. S. A. Ahmad, “Laser concepts and Applications” New Age International.