

Second Semester 2016-2017

Stage :Fourth year physics student

Course Name : Laser Physics (2)

Instructor Name: A.Prof. Dr. Khalid Abbas Yahya

Course Weekly Outline

Week	Topics Covered
1	Laser modes ,Absorption and Gain coefficient ,Intensity losses, Amplifier condition in laser cavity , Minimum pumping power.
2	Power laser, General principles of power laser ,Pumping power laser, Cross section of stimulated emission ,Choice of optical cavity , Choice of Q-Switching methods, Amplifier system , Chain architectare.
3	Description of the main power laser, Solid laser ,Chemical laser, Iodine laser.
4	Excimer laser, Exciplex laser, TEA and EDL carbon dioxide laser, Free electron laser.
5	High power laser, Material interaction, Surface absorption of high flux laser energy , Creation of individual excited states.
6	Creation of collective excited states plasmons , Emission of particle ,Electron emission.
7	Photon emission ,Emission of neutral or exited atoms.
8	Emission of ionized molecules or atom, Photon emission ,Polarition creation,
9	Some applications of laser beams, Using laser in physics and chemistry ,Using laser to study Raman spectroscopy ,Using laser in isotope separation.
10	Laser fusion ,Using laser in chemistry.
11	Holography ,Using laser in optical communication .
12	Using laser in industry applications.
13	Using laser in medical applications.
14	Using laser in military applications.
15	Safety in laser environment.

Textbook:

- 1- " Laser Physics and Applications",
Editors: G. Herziger, H. Weber, R. Poprawe
Authors: J. BerJnek, M. Hugenschmidt, U. Keller, G. Marowsky, K. Rohlena,W. Schulz, W. Seelig, P. Simon, U. Sowada, S. SzatmJri, J.Uhlenbusch, W. ViJl, R. Wester , Cambridge , 2007.
- 2- "فيزياء الليزر وبعض التطبيقات العملية "
د. سهام عفيف قندلا , ١٩٨٨

A.Prof. Dr. Khalid Abbas Yahya