Course Specifications

Programme(s) on which the course is given: Physics & Laser
Major or Minor element of program Physics
Department offering the program Physics
Department offering the course Physics
Academic year / Level fourth
2012 Date of specification approval

A- Basic Information

Title	**Laser safety**	**Code: L435**
Credit Hours	**2 h**	**Lecture: 2h**
Tutorial: 00	**Practicals:00**	**Total: 2h**

B- Professional Information

1 – Overall Aims of Course

by the end of this course the student should know that:
Laser radiation of sufficient intensity and exposure time can cause irreversible damage to the skin and eye of man. The thermal damage process is generally associated with lasers operating at exposure times greater than 10 microseconds and in the wavelength region from the near ultraviolet to the far infrared (0.315 - 103 ?m).
Other damage mechanisms have also been demonstrated for other specific wavelength ranges and/or exposure times as shown in Table III-1. Tissue damage may also be caused by thermally induced acoustic-shock waves following exposures to very short-time laser exposures (submicrosecond).
The principle tissue damage mechanism for repetitively pulsed or scanned laser exposures is still in question. Current evidence would indicate that the major mechanism is a thermal process wherein the effects of the individual pulses are additive. eye damage; however, with the expanding use of higher-power laser systems, the unprotected skin of personnel using lasers may be exposed more frequently to hazardous levels.

2 – Intended Learning Outcomes of Course (ILOs)

a Knowledge and Understanding:

After completing the course the student should be able to

a1- Know Eye Effects at Different Wavelengths

a2- illustrate Exposure Limits

a3- give an account on Biological Damage Mechanisms.

b-Intellectual Skills

After completing the course the student should be able to

b1- knowledge about the new ideas in laser safty

b2- scientific reports about some points in laser safty

c-Professional and Practical Skills

After completing the course the student should be able to

C1-design protective how to avoid laser hazards

c2-apply for measuring the Exposure Limits

d-General and Transferable Skills

d1- team working

3- Contents

Topic	No. of hours	Lecture	Tutorial/Practical
General Overview	4	2	0
Ultraviolet Effects on the Skin	4	2	0
Ocular Effects of Laser Radiation	4	2	0
Extended Source Viewing	4	2	0
Eye Effects at Different Wavelengths	4	2	0
Biological Damage Mechanisms	4	2	0
Exposure Limits	1	1	0

4– Teaching and Learning Methods

4.1-Lecture

4.2- discussion

5- Student Assessment Methods

5.1 oral to assess understanding

5.2-written exams to assess investigation, and derivations.

5.3 report to assess scientific review.

Assessment Schedule

Assessment 1	**sheet exam**	**Week 8&16 (mid &final term).**
Assessment 2	**oral exams**	**Week every 2 weeks**
Assessment 3	**reaserch projects**	**Week 5**

Weighting of Assessments

20 %	**Mid-Term Examination**	
%	**Final-term Examination**	**60**
%	**Oral Examination.**	**5**
%	**10 Practical Examination**	
%	**5 Semester Work**	
100 %	**Total**	

6- List of References

6.1- "laser and nonlinear optics"

6.2- The Science of Sun Protection, Talk of the Nation Science Friday, 24 June 2005. Vitamin D pills recommended over sun exposure, but most people in Australia and Canada get enough Vitamin D by incidental exposure,

6.3- ^ "Laser safety". Retrieved 19 May 2011.

6.4- Van Norren D., Keunen J.E., Vos J.J., 1998. The laser pointer: no demonstrated danger to the eyes. Ned Tijdschr Geneeskd. 142(36):1979-82
6.5- Mainster, M.A., Stuck, B.E. & Brown, J., Jr 2004. Assessment of alleged retinal laser injuries. Arch Ophthalmol, 122, 1210-1217
6.6- Fiber Optic Microscope with improved eye safety

7- Facilities Required for Teaching and Learning

Data show – lab top computer - pens – blackboard - ...etc.

Course Coordinator: Dr.Mohamed Badr **Head of Department: Prof.Dr. Sana Maize** **Date: / /**