Department of Physics

College of science

University of Salahaddin-Erbil

Subject Optics Laboratory Course Book

3rd year medical

Dr : Amang Frenses

Dr.Ahmad Hasan

Assist. Lecturers: Samira Yousif Asoka

Academic Year: 2022 - 2023

Course Book

1. Course name	**Applied optics laboratory**
2. Lecturer in charge	**Samira y. Asoka**
3. Department/ College	**Physics /science**
4. Contact	**E-mail : samira.asoka@su.edu.krd** **Tel: (optional)**
5. Time (in hours) per week	**practical: 6**
6. Office hours	**All days(9Am-3Pm)**
7. Course code	
8. Teacher's academic profile	**- I awarded B.Sc. in physics (College of Science) in 1989 Salahaddin University.** **- M.Sc. in 2007 (Salahaddin University-Erbil).** **- Assist. Lecturer from 2007 till now.**
9. Keywords	**Lens, mirror, interference, diffraction, polarization**

10. Course overview:

the objective of this course is to teach optical phenomenon, the refraction and reflection of light from mirrors and lenses, and also to teach students the basic concepts about optical instruments used in the interpretation of the qualities of light and image formation and visual processing defects as a geometrical optics in addition to the physical optics which includes experiments of interference of light from silts and how to determine the wavelength of the light source by interference and producing polarizer light. The student can keep place with technological development nowadays.

11. Course objective:

− The course wills ever optics texts of selective topics together with print media or internet articles which deal with current applied optics issues. Instructional strategies attempt to strike a balance between developing the students' ability to cope with experimental optics texts, extending their general academic reading skills, and increasing their basic knowledge and understanding of applied optics. The laboratory will give students a better understanding of a number of optics experiment topics, the followings are examples but not restricted to: Study the concept principle of light absorption and emissions, Study the light theory, Study light and its characteristics, Understand the different applications of light, with some extra topics that will be identified as the course progress.

12. Student's obligation

-The student should attend laboratory as much as possible.

- The student must be read the required experiment, teacher's notes regularly.

- The student must be participating in laboratory discussions, preparing the assignments given in the course**.**

13. Forms of teaching

data sheet for the experiment including the name of experiment, the aim of the experiment the apparatus used for experiment the procedure and theory used for the experiment and the result and discussion needed for satisfied the experiment. There will be laboratory discussions and the experiment will give enough background to solve, analyze, and evaluate problems sets, and different issues discussed throughout the course.

14. Assessment scheme

The students are required to do report for each experiment worked in laboratory, tow closed book exams at the semester besides other assignments quizzes exam. The exams have 7 marks, the reports and the attendance, classroom activities count 7 marks the average of them is semester marks. There will be a final exam on 10 marks. So that the final grade will be based upon the following criteria:

One semester exams: 20 %
Reports and laboratory participation and assignments 10 %
Seminar 5%
Quizzes 5 %
Final exam 60 %

15. Student learning outcome:

- Students will be able to demonstrate knowledge of principles of geometrical and physical optics, mathematics, optical properties of materials and electromagnetic wave theory. - ---- Students will be able to apply these principles to solve technical problems encountered in optics, and possess the necessary skills to develop a solution within a framework of critical thinking

16. Course Reading List and References:

1- **Practical physics** by E. Armetage, publishing J. Murray Ltd, UK.
2- **Optics** by W. Francis , Wesley publishing company.USA.
3- Introduction to optics,3rd ed ,F.L .Pedrotti, L.S Pedrotti and L.M. Pedrotti(2007).

And any other **optics textbook** published in 21st century.

17. The Topics:

18. Practical Topics

Table of experiments:

1- Refractive index of liquid and glass slab using traveling microscope

2- Spherical and Chromatic aberration of a lens.

3- Determination of cardinal point of thick (or compound) lens.

4- Double Refraction of Calcite Crystal.
5- Determination of Magnifying Power (M) of Microscope.
6- Photometer units and Invers square law of light.
7- Chromatic dispersion of a prism and determination of Cauchy's constants A and B.
8- Fresnel's Biprism.
9- Interference by wedge shaped film.
10- Michelson interferometer.
11- Determination of the wavelength of Na-light by Newton's rings.
12- Single Slit Diffraction
13- Resolving Power of Optical Instruments.
14- Diffraction grating.
15- Diffraction from compact discs.
16- Fraunhofer Diffraction from a circular aperture
17- Reflection of light from dielectric material and Brewster's angle
18- Polarization and Malus' law
19- Measurement of Specific Rotation of Sugar Solution
20- Kerreffect

19. Examinations:

20. Extra notes:

1) This course is suitable for the 3rd year students (B.Sc.), it's very difficult for the 1st and 2nd years B.Sc.

2) This course is useful in different fields to get works in private sector.

21. Preview پێداچوونەوەی هاوەڵ

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.

(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).

ئەم کۆرسبووکە دەبێت لەلایەن هاوەڵێکی ئەکادیمیەوە سەیر بکرێت و ناوەرۆکی بابەتەکانی کۆرسەکە پەسەند بکات و جەند ووشەیەک بنووسێت لەسەر شیاوی ناوەرۆکی کۆرسەکە و واژووی لەسەر بکات.
هاوەڵ ئەو کەسەیە کە زانیاری هەبێت لەسەر کۆرسەکە و دەبیت پلەی زانستی لە مامۆستا کەمتر نەبێت.