Course Description Form

1. Course Name: Medical and optical physics

2. Course Code: Hopt71103

3. Semester : (1)

4. Description Preparation Date: 04.04.2026

5. Available Attendance Forms: Theoretical- practical

6. Number of Credit Hours (Total) / Number of Units (Total)

30 hours

7. Course administrator's name (mention all, if more than one name)

Assistant Professor Dr. Safaa Mohammed Ridha Hussein

8. Course Objectives

Course Objectives

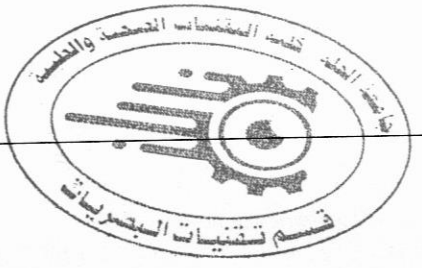
General Objective: By the end of the semester, the student will be able to understand optical phenomena in physics.

Specific Objectives:

1. To identify light and the electromagnetic spectrum.
2. To identify optical phenomena such as reflection, refraction, polarization, and diffraction.
3. To identify mirrors, their types, and solve related problems, and to use the telescope as one of their applications.
4. To identify prisms and lenses, their types and disadvantages, and to solve related problems.
5. To identify the eye, its parts, and the instruments used to examine it.
6. To understand how vision works, refractive errors that affect the eye, and how to correct them.
7. To understand visual acuity.

9. Teaching and Learning Strategies

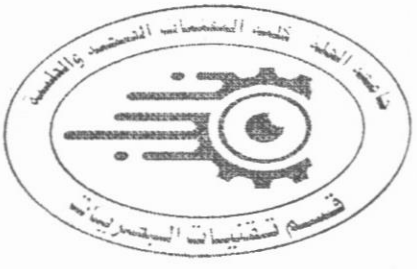
Strategy	• Using PowerPoint lectures • Educational videos • Guiding students to useful websites • Practical lab on models
	Assessment methods



	• Conducting daily quizzes • Conducting monthly exams • Conducting midterm and final exams

10. Course Structure

Week	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical+ 2practical	Light and vision: introduction;	Theoretical+ practical	Quiz+Reports
2	2 theoretical+ 2practical	Reflection: definition; Reflection at plan surfaces; regular Reflection; ir regular reflection image formation by plane mirror;	Theoretical + practical	Quiz+Reports
3	2 theoretical+ 2practical	direction of image seen by eye.	Theoretical + practical	Quiz+Reports
4	2 theoretical+ 2practical	Refractive index	Theoretical + practical	Quiz+Reports
5	2 theoretical+ 2practical	Mirror (definition; focal length, type)	Theoretical + practical	Quiz+Reports
6	2 theoretical+ 2practical	Refraction: definition; Refraction index total internal Reflection, critical angel.	Theoretical + practical	Quiz+Reports
7	2 theoretical+ 2practical	Reflection at curved mirror, spherical mirror, type of spherical mirror, rays' diagram for a concave and convex	Theoretical ++ practical	Quiz+Reports
8	2 theoretical+ 2practical	Magnification, mirror equation, examples	Theoretical ++ practical	Quiz+Reports
9	2 theoretical+ 2practical	Dispersion and the visible spectrum.	Theoretical ++ practical	Quiz+Reports



10	2 theoretical+ 2practical	Polarization: definition; types.	Theoretical ++ practical	Quiz+Reports
11	2 theoretical+ 2practical	Diffraction: definition; concept; grating; mechanism; constructive. And destructive	Theoretical ++ practical	Quiz+Reports
12	2 theoretical+ 2practical	Prism (dispersion)	Theoretical ++ practical	Quiz+Reports
13	2 theoretical+ 2practical	Eye: definition; parts; focusing element; photoreceptors cells;;	Theoretical ++ practical	Quiz+Reports
14	2 theoretical+ 2practical	accommodation. Real &the apparent depth	Theoretical ++ practical	Quiz+Reports
15	2 theoretical+ 2practical	Examples and tutorials	Theoretical ++ practical	Quiz+Reports

11.Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc ٣٥monthly exam ٥reports + Quiz 60 Final exam

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Bushberg, J. T., Seibert, J. A., Leidholdt, E. M., & Boone, J. M. (2020). The Essential Physics of Medical Imaging (4th ed.). Lippincott Williams & Wilkins.https://shop.lww.com/The-Essential-Physics-ofMedical-Imaging/p/9781451118100
Main references (sources)	Richardson, D. J., & Slavík, R. (2024). Future trends in highcapacity optical fiber communications. Journal of Lightwave Technology, 42(4), 1102-1115. https://ieeexplore.ieee.org/document/10360214
Recommended books and references (scientific journals, reports...)	By providing printed lectures where they are done Discussing the scientific material and making important notes during Lecture Lectures and explanations such as using a device projector

Electronic References, Websites	The Internet, YouTube, and e-book

Asst. Prof. Dr. Safaa Mohammed Ridha Hussein