Course Description Form

1. Course Name: Medical and optical physics

2. Course Code: Hopt71203

3. Semester : (٢)

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 waves; light velocity; light rays and beams; electromagnetic spectrum.	Theoretical+ practical	Quiz+Reports
2	2 theoretical+ 2practical	Lenses: definition; focal length	Theoretical + practical	Quiz+Reports
3	2 theoretical+ 2practical	lens power; types focal point.	Theoretical + practical	Quiz+Reports
4	2 theoretical+ 2practical	Thin lenses formula.	Theoretical + practical	Quiz+Reports
5	2 theoretical+ 2practical	Contact lenses and their types	Theoretical + practical	Quiz+Reports
6	2 theoretical+ 2practical	Refractive errors in the eye	Theoretical + practical	Quiz+Reports
7	2 theoretical+ 2practical	Types of refractive errors: myopia (nearsightedness), hyperopia (farsightedness)	Theoretical + + practical	Quiz+Reports
8	2 theoretical+ 2practical	astigmatism, and presbyopia (age-related myopia).	Theoretical + + practical	Quiz+Reports
9	2 theoretical+ 2practical	Lined and unlined lenses	Theoretical + + practical	Quiz+Reports



10	2 theoretical+ 2practical	Advanced dual-surface lenses	Theoretical ++ practical	Quiz+Reports
11	2 theoretical+ 2practical	Optical aberrations	Theoretical ++ practical	Quiz+Reports
12	2 theoretical+ 2practical	And spherical aberration	Theoretical ++ practical	Quiz+Reports
13	2 theoretical+ 2practical	Fresnel lenses and Fraunhofer lenses	Theoretical ++ practical	Quiz+Reports
14	2 theoretical+ 2practical	Optical systems	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

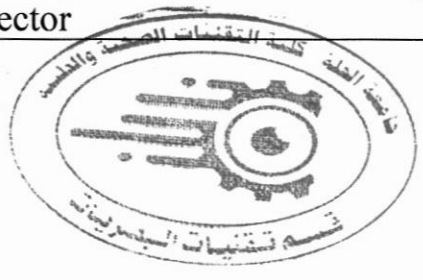
٣٥monthly exam

٥reports + Quiz

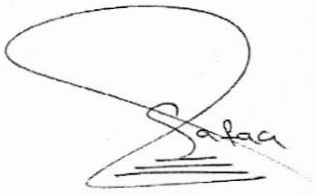
60 Final exam

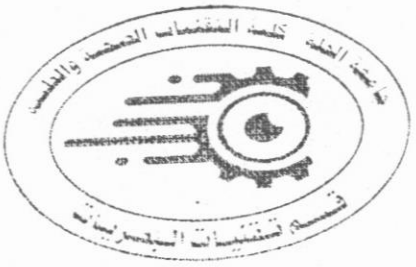
12.Learning and Teaching Resources

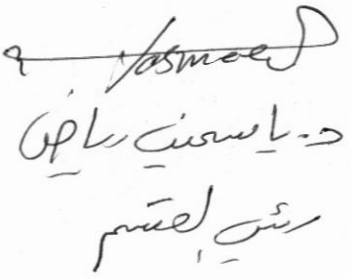
Required textbooks (curricular books, if any)	Bushberg, J. T., Seibert, J. A., Leidholdt, E. M., & Boone, J. M. (2020). The Essential Physics of Medical Imaging (4th ed.). Lippincott Williams & Wilkins.https://shop.lww.com/The-Essential-Physics-ofMedical-Imaging/p/9781451118100
Main references (sources)	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

