Jordan University of Science and Technology

Faculty of Applied Medical Sciences

Optometry Department

OPT.104 Geometrical &Physical Optics - JNQF Level: 7
Second Semester 2023-2024

Course Catalog
3 Credit Hours. Geometrical & Physical Optics is a comprehensive study of the behavior and properties of light, covering both its geometrical aspects and physical phenomena. This course delves into the fundamental principles governing the propagation of light, its interaction with various optical elements, and its applications in various optical systems. Students will explore a wide range of topics, including the nature of light, reflection, refraction, dispersion, and the formation of images by mirrors and lenses. Additionally, the course will cover advanced topics such as interference, diffraction, polarization, and common vision defects.
Teaching Method: Blended

Text Book	
Title	Physics for Scientists and Engineers with Modern Physics.
Author(s)	Raymond A. Serway & John W. Jewett
Edition	8th Edition
Short Name	Ref #1
Other Information	www.cengage.com

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Clinical Optics	Elkington, A. R.	3rd Edition	

Instructor	
Name	**Dr. Mohammad Anwar Alebrahim**
Office Location	Faculty of Applied Medical Sciences - GF
Office Hours	
Email	maalebrahim@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon : 10:00 - 11:30 Room: N1302

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
1101020	OPT.102 Introduction To Optometry	Pre./Con.

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2, 3	The Nature of Light, Reflection and Refraction , The Low of Refraction, Dispersion and Prisms, The Rainbow, Huygens's Principle, Total Internal Reflection	From **Ref #1**
Weeks 4, 5, 6, 7	Flat Mirrors , Images Farmed by Concave Mirrors, Convex Mirrors and Sign Conventions, Images Formed by Refraction, Atmospheric Refraction, Thin Lenses, Lens and Mirror Aberrations	From **Ref #1**
Weeks 8, 9, 10, 11	Conditions for Interference, Young's Double-Slit Experiment, Change of Phase Due to Reflection, Interference in Thin Films, Using Interference to Read CDs and DVDs, Diffraction, Single-Slit Diffraction, The Diffraction Grating, Polarization of Light Waves	From **Ref #1**
Weeks 12, 13, 14	The Camera, The Eye, The Simple Magnifier, The Compound Microscope, The Telescope, Resolution of Single-Slit and Circular Apertures, The Michelson Interferometer	From **Ref #1**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Analyze and apply fundamental principles of geometrical and physical optics to predict the behavior of light in various optical systems, including reflection, refraction, and image formation by mirrors and lenses. [33PLO 1] [1L7K1]	33%	
Evaluate and interpret optical phenomena such as interference, diffraction, and polarization, and demonstrate their practical applications in modern technologies and devices, ranging from microscopes and telescopes to optical communication systems. [33PLO 7] [1L7S1, 1L7S2]	33%	
Investigate and explain common vision defects, their causes, and corrective measures, demonstrating an understanding of the optics of the human eye and the design principles of vision correction devices, such as glasses and contact lenses. [34PLO 3] [1L7C4]	34%	

Relationship to Program Student Outcomes (Out of 100%)								
PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
33		34				33		

Relationship to NQF Outcomes (Out of 100%)			
L7K1	L7S1	L7S2	L7C4
33	16.5	16.5	34

Evaluation	
Assessment Tool	**Weight**
Midterm Exam	50%
Final Exam	50%

Policy	
Code of Conduct and Academic Integrity Guidelines	Statement on Professionalism Professional behavior is expected of students at all times. Attitude and professional behavior are a minimum criterion for passing this class. Examples of unprofessional behavior include but are not limited to: missing classes, tardiness, lack of attention for a speaker, talking to others during lecture, leaving a lecture prior to its completion without prior authorization of the instructor, working on other class material during class, and sleeping during class. Cheating: University regulations will be applied on cases of cheating and/or plagiarism Cell phone: The use of cellular phone is prohibited in class rooms and during exams. The cellular phone must be switched off in class rooms and during exams. Attendance: No points will be count for points attendance of this class, however attending the lectures will greatly enhance your grade. The student is responsible for any information discussed in lecture sessions. It is imperative to attend all classes! Absences: University regulations will be applied. Students are not allowed to be absent for more than 20% of lectures for any reason or excuse. If a student exceeds the absence limit, he or she will not be allowed to sit for future course exams. (Please review university regulation for more details) Make-up Exam: is entitled for students who miss the exam with accepted legal or medical excuse endorsed by the instructor within 24 hours after the scheduled exam (Please review university regulation for more details) Feedback: Concerns, complaints, questions, and/or feedback are appreciated and will be important for the instructor. You can contact your instructor using the e-mail or during office hours.

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