

February 2027

# **OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM**

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENGR 115		Number of Credits: 1 Course credit policy (105)					
Course Full Title: Engineering Optics							
Course Short Title:							
(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)							
Faculty: Faculty of Applied and Technical St	udies	Department (or program if no department): Physics					
Calendar Description:							
Students investigate the physical optics of mirrors and lenses, the wave optics of interference and diffraction, and some properties of electromagnetic waves.							
Note: This course together with PHYS 112 is the PHYS II content for the Engineering Curriculum Common Core. Note: Students with credit for PHYS 225 cannot take this course for further credit.							
Prerequisites (or NONE):							
Corequisites (if applicable, or NONE):	PHYS 112.						
Pre/corequisites (if applicable, or NONE):							
Antirequisite Courses (Cannot be taken for additional credit.)			Special Topics (Double-click on boxes to select.)				
Former course code/number:			This course is offered with different topics:				
Cross-listed with:			$\square$ No $\square$ Yes (If yes, topic will be recorded when offered.)				
Dual-listed with:			Indepe	Independent Study			
Equivalent course(s): PHYS 225			If offere	If offered as an Independent Study course, this course may			
(If offered in the previous five years, antirequ	isite course(s	s) will be	be repeated for further credit: ( <i>If yes, topic will be recorded.</i> ) ⊠ No □ Yes, repeat(s) □ Yes, no limit				
Included in the calendar description as a note for the antirequisite course(s) cannot take thi	e that student s course for f	ts with credit (urther credit )					
			Transfe	Fransfer Credit			
Typical Structure of Instructional Hours			Transfer credit already exists: (See <u>bctransferguide.ca</u> .)				
Lecture/seminar hours 12			🖾 No 🔲 Yes				
Tutorials/workshops	6	Submit	Submit outline for (re)articulation:				
Supervised laboratory hours		$\Box$ No $\boxtimes$ Yes (If yes, fill in transfer credit form.)					
Experiential (field experience, practicum, internship, etc.)			Grading System				
Supervised online activities		🛛 Lette	er Grades 🗌 Credit/No	Credit			
Other contact hours:			Maxim	um enrolment (for inform	nation only): 24		
Total hours 18 Expected Frequency of Course Offerings:					Offerings:		
Labs to be scheduled independent of lecture	hours: 🛛 N	lo 🗌 Yes	Fall (Ev	very semester, Fall only, a	nnually, etc.)		
Department / Program Head or Director:				Date approved:	December 2020		
Faculty Council approval				Date approved:	January 8, 2021		
Dean/Associate VP:				Date approved:	January 8, 2021		
Campus-Wide Consultation (CWC)				Date of posting:	February 19, 2021		
Undergraduate Education Committee (UEC) approval			Date of meeting:	February 26, 2021			

#### **ENGR 115**

### Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Analyze the reflection and refraction of light rays.
- Apply graphical and analytical methods to determine the location and size of an image reflected by a mirror, reflected or refracted by a spherical surface (convex or concave), and formed by a thin lens (converging or diverging).
- Articulate the concepts of constructive and destructive interference between two or more waves Describe the pattern produced by two-slit interference.
- Calculate the intensity at various points in an interference pattern.

#### Prior Learning Assessment and Recognition (PLAR)

□ Yes □ No, PLAR cannot be awarded for this course because content is mandated by governing body.

**Typical Instructional Methods** (Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.) Lecture, in-class tutorial, assignments

#### NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Ту	Typical Text(s) and Resource Materials (If more space is required, download Supplemental Texts and Resource Materials form.)						
	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year		
1.	Young and Freedman	University Physics	$\boxtimes$	Pearson			
2.							
3.							
4.							
5.							
Remained Additional Compliance of Metanials (Orffunger Learning to be an existing delation of a)							

Required Additional Supplies and Materials (Software, hardware, tools, specialized clothing, etc.)

### **Typical Evaluation Methods and Weighting**

Final exam:	35%	Assignments:	15%	Field experience:	%	Portfolio:	%
Midterm exam:	30%	Project:	%	Practicum:	%	Other:	%
Quizzes/tests:	10%	Lab work:	10%	Shop work:	%	Total:	100%

## Details (if necessary):

#### **Typical Course Content and Topics**

- Plane mirror; image formation
- Waves; travelling wave equation; sound waves
- Doppler effect; reflection and transmission; superposition and interference; standing waves
- Interference and diffraction of light waves; Young's double slit experiment
- Single slit diffraction; multiple slit patterns; quantum theory; wave-particle duality

Labs on interference and diffraction