



PHYS 2P51

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PHYS 2P51 - Introduction to Classical and Modern Optics

Course outline

– Instructors

- » Lectures: [D. Crandles](#), Office hours Tues 3-4 pm
- » Labs: [Ivana Komljenovic-Metcalf](#)

– About this course

What [Brock calendar entry](#) says:

- » Geometrical and wave optics, reflection, refraction, lenses, matrix methods, aberrations, gradient index phenomena including fibre optics, interference, coherence, holography, Fraunhofer and Fresnel diffraction and polarization

What do I need to bring into the course?

- » In this course some simple derivatives, integrals and matrices will be used, so it is important that the students feel comfortable with the calculus covered in Y1 mathematics courses. The course will build on the optics covered in first year Physics courses. As such, the prerequisites are: PHYS 1P21 or 1P91 (recommended); PHYS 1P22 or 1P92 (recommended); MATH 1P01 and 1P02, or MATH 1P05 and 1P06 (recommended).

Times and Locations

- » Lectures MW 11-12.30 TH257
- » Labs MCH308.
- » An introduction to the laboratory/research skills component will be held the week of Jan 15. Attendance is mandatory

Textbook

- » Introduction to Optics, 3rd edition, F.L. Pedrotti, L.M. Pedrotti and L.S. Pedrotti, Cambridge University Press, 2018.

Important Dates Jan-Apr. 2024 (FW23D3)

- » First day of classes: Jan. 8
- » Last day of classes: Apr. 5
- » Snow/Reading Days: Apr. 9
- » Reading Week: Feb. 19-23
- » Exams Apr. 10-23
- » Deadline for withdrawal without academic penalty: March 8

– Topics to be covered

This is an approximate list . As the course progresses, some of topics may be removed and some others may get added.

- » Chapter 1: Nature of Light
- » Chapter 2: Geometrical Optics
- » Chapter 3: Optical Instrumentation
- » Chapter 4: Wave Equations
- » Chapter 5: Superposition of Waves
- » Chapter 6: Properties of Lasers
- » Chapter 7: Interference of Light
- » Chapter 8: Optical Interferometry
- » Chapter 9: Coherence
- » Chapter 10: Fraunhofer Diffraction
- » Chapter 11: Fresnel Diffraction
- » Chapter 15: Production of Polarized Light

– Grading and the grading scheme

Component	PHYS 2P51	Comments

Reading Quizzes	10%	Quizzes to be completed on the Möbius platform. Links to quizzes in Brightspace. For credit, answers must be submitted before due date.
Homework Assignments	25%	Approximately 1 per week submitted on Brightspace. Late assignments not accepted.
Midterm Test	15%	During scheduled time slot Monday Feb 26th.
final exam	30%	You must obtain a grade of 40% or greater on the final exam in order to pass the course.
lab/research skills	$8 \times 2.5\% = 20\%$	<i>Both</i> attending the lab/research skills sessions <i>and</i> submitting the assigned work is required to complete a lab/research skills item. Due dates will depend on lab schedule. In general lab assignments are due 5 days after lab session and no late submissions will be accepted.

– Expectations and responsibilities

You are expected to:

- » [attend each scheduled lecture and laboratory session](#);
- » do your work honestly and maintain academic integrity (see a separate section below for details);
- » attend labs having **prepared in advance** by reading relevant parts of the lab manual, and having completed the prelab problems.
- » invest approximately 10 hours per week in this course (3 hours for lectures, 3 hours for labs, 4 hours for study and homework)

– Homework

Homework Assignments will be accessible from Brightspace.

– Academic Integrity

Academic misconduct is a serious offence. The principle of academic integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should consult "[Academic Misconduct](#)" section in the Undergraduate Calendar to view a fuller description of prohibited actions, and the procedures and penalties. The University takes academic misconduct extremely seriously and will follow its strict procedures to the letter in all cases.

A helpful website explains Brock's [Academic Integrity Policy](#). Please consult it, as all students are expected to know and abide by its provisions.

Courses may use [turnitin.com](#), a phrase-matching software, to verify originality of your submitted lab reports and written assignments. If you object to uploading your assignments to [turnitin.com](#) for any reason, please notify the instructor to discuss alternative submissions.

Be aware that it is the policy of the Department of Physics that any academic misconduct including (but not limited to) possessing, using or accessing unauthorized material in any form (including online) during final exams or assessments will *automatically* result in zero grade for the exam. Since most courses require a minimum passing grade on the final exam to complete the course, this will likely lead to a failure in the course.

FMS Penalties for Academic Misconduct

Unless otherwise specified, the Department of Physics follows the following minimum penalty guidelines for cases of academic misconduct in the Faculty of Mathematics and Science (FMS). Please be aware that the Associate Dean, Undergraduate Programs, may assign different penalties than those listed here, depending on the details of individual cases. Also note that cheating on exams carries significantly higher penalties.

First offence:

Zero grade on the assignment, additional penalty of 100% of the weight of the assignment to be subtracted from the final grade, mandatory completion of the AZLS Academic Integrity workshop

Second offence:

Zero grade on assignment, additional penalty of 200% of the weight of the assignment to be subtracted from the final grade, 4-month suspension

Third or additional offence:

Zero grade in the course, 1-year suspension, permanent removal from major program.

Cheating on exams:

Zero grade in the course, including for first offenses.

– FMS Academic Policies

Intellectual Property Notice

All slides, presentations, handouts, tests, exams, and other course materials created by the instructor in this course are the intellectual property of the instructor. A student who publicly posts or sells an instructor's work, without the instructor's express consent, may be charged with misconduct under Brock's Academic Integrity Policy

and/or Code of Conduct, and may also face adverse legal consequences for infringement of intellectual property rights.

Important dates

Please be aware of all the important dates, such as the first/last days of classes, snow days and reading week, as well as the deadline for withdrawal without academic penalty. For the current academic term, this information can be found [here](#).

Accommodations

The University is committed to fostering an inclusive and supportive environment for all students and will adhere to the Human Rights principles that ensure respect for dignity, individualized accommodation, inclusion and full participation. The University provides a wide range of resources to assist students, as follows:

- a. If you require academic accommodation because of a disability or an ongoing health or mental health condition, please contact Student Accessibility Services at askSAS@brocku.ca or 905 688 5550 ext. 3240.
- b. **Medical Self-Declaration Forms** (brief absence up to 72 hours)

In the case of a short-term medical circumstance, if a student wishes to seek an academic consideration, please use the [Medical Self-Declaration Form](#). The request is to be made in good faith by the student requesting the academic consideration due to a short-term condition that impacts their academic activities (e.g., participation in academic classes, delay in assignments, etc.). The period of this short-term medical condition for academic consideration must fall within a 72-hour (3 day) period. The form must be submitted to the instructor either during your brief absence or if you are too unwell, within 24 hours of the end of your 3 day brief absence.

Medical Verification Form (extended duration)

In cases where a student requests academic consideration due to a medical circumstance that exceeds 72 hours (three days) and will impact their academic activities (e.g., participation in academic classes, delay in assignments, etc.), or in the case of a final exam deferral, the [medical verification form](#) must be signed by the student and the health professional as per process set out in the [Faculty Handbook III:9.4.1](#).

- c. If you are experiencing mental health concerns, contact the Student Wellness and Accessibility Centre. [Good2Talk](#) is a service specifically for post-secondary students, available 24/7, 365 days a year, and provides anonymous assistance. Follow the above link or call 1-866-925-5454. For information on wellness, coping and resiliency, visit: [Brock University \(Mental Health\)](#).
- d. If you require academic accommodation on religious grounds, you should make a formal, written request to your instructor(s) for alternative dates and/or means of satisfying requirements. Such requests should be made during the first two weeks of any given academic term, or as soon as possible after a need for accommodation is known to exist.
- e. If you have been affected by sexual violence, the Human Rights & Equity Office offers support, information, reasonable accommodations, and resources through the Sexual Violence Support & Education Coordinator. For information on sexual violence, visit [Brock's Sexual Assault and Harassment Policy](#) or contact the Sexual Violence Support & Response Coordinator at humanrights@brocku.ca or 905 688 5550 ext. 4387.
- f. If you have experienced discrimination or harassment on any of the above grounds, including racial, gender or other forms of discrimination, contact the Human Rights and Equity Office at humanrights@brocku.ca.

For a full description of academic policies in the Faculty of Mathematics and Science, consult brocku.ca/mathematics-science/