

PHY 1122 – Fundamentals of Physics II

Spring–Summer, 2023 (Session A – Lectures May 1 to July 21)

Course website available on Brightspace:

<https://uottawa.brightspace.com/d2l/home>

Course instructor:

Dr. Michael Wong

Department of Physics, University of Ottawa

Email: mwong@uottawa.ca

Office: STM 368

Telephone: (613) 562-5800 × 2323

Schedule:

<u>Lectures</u>	<u>Office Hours</u>	<u>Discussion group</u>	<u>Labs</u>
Tue 10:00 – 11:20 am Room: CBY B012	By appointment In-person or virtual (Zoom / MS Teams)	Fri 13:00 – 14:20 am Room: CBY B012	Check separate Brightspace Lab website for more information.
Thu 10:00 – 11:20 am Room: MNO E217			

Course description and order of topics:

Heat and thermodynamics. Hydrostatics and hydrodynamics. Geometrical optics. Wave theory, Physical optics. Electrostatics. Direct current circuits. A second course intended primarily for students in the physical sciences and engineering. A familiarity with vector algebra and some understanding of calculus is assumed.

Prerequisite: OAC or 4U physics. Corequisite: MAT 1320 or 1321(preferred) or 1327 or 1330.

0) Intro and review of basic mechanics (0.5 lectures)

1) Electrostatics (Chs. 21 – 26, ~7.5 lectures)

- Electric charge, force, and field, Coulomb's law.
- Electric potential and energy, electric flux and Gauss's law.
- Capacitance and dielectrics, current and resistance, electromotive force.
- DC Circuits, Kirchhoff's rules.

2) Thermodynamics (Chs. 17 – 20, ~6 lectures)

- Temperature, heat, phase changes.
- State equations, thermal properties and phases of matter, heat capacities.
- Laws of thermodynamics, ideal gases, energies and processes, entropy.

3) Fluid mechanics (Ch. 12, ~2 lectures)

- Density, pressure, buoyancy, fluid flow, Bernoulli's equations, turbulence.

4) Optics (Chs. 33 – 36, ~6 lectures)

- Particle nature of light, ray optics, reflection/refraction/dispersion, lenses.
- Wave nature of light, interference, diffraction and applications.

Course materials:

Textbook: Young and Freedman, *University Physics (with Modern Physics)*, 15th Edition

- Available for purchase from Campus Bookstore (<https://www.bkstr.com/ottawastore/home>).
- You can buy Mastering Physics with the eText, with the textbook, or Mastering Physics only.
- You can use an older version of the book as long as you realize the problem numbers may be different.
- **All lecture notes, DGD questions, and review materials will be available on Brightspace.**

Evaluations:

Assignments	Labs	Midterm 1	Midterm 2	Final exam
20%	20%	15%	15%	30%

Assignments (online):

- There will be ~10 assignments throughout the semester to be completed using **Mastering Physics**.
- Each assignment will have 3-5 problems to solve, some with multiple parts.
- Please see the Mastering Physics section in Brightspace for more information.

Labs (in-person):

- The labs are managed separately from the course. More information is available below and on a separate Brightspace website for the labs.

Midterm exams and dates:

Tuesday, May 30, 2023 (10:00 – 11:20 am, Room CBY B012 during lecture time)

Thursday, June 29, 2023 (10:00 – 11:20 am, Room MNO E217 during lecture time)

- The midterm exams will be closed-book, **in-person** tests. More details will be available in Brightspace.
- If you are unable to write a midterm exam with proper justification then you must notify the instructor within 7 days of the exam or else you will receive a zero.
- If you miss a midterm for a valid reason, the weight will be transferred to the final exam. If you miss both midterms for valid reasons then there will be a redistribution of the weight by the instructor on a case-by-case basis.

Final exam and date: Thursday, July 27, 2023.

- The final exam will be a closed-book, **in-person** test. More details will be available in Brightspace.
- If you are unable to write the final exam with proper justification then you must apply to the Faculty of Science undergraduate office to write the deferred exam during the period Oct. 22 – 28, 2023.

Teaching assistants:

- Athulya Thulaseedharan (athul066@uottawa.ca) will be teaching DGD sessions and proctoring.
- Neda Boroumand (nboro046@uottawa.ca) will be doing corrections/assignments and proctoring.

Academic fraud:

- The university's policy on academic fraud is here:
<http://www.uottawa.ca/academic-regulations/academic-fraud.html>
- Please see the academic fraud section in Brightspace under the Policies module for more information.

Laboratory component of 1st year physics course (Spring, 2023)

The lab component will study measurements and several different classical physics experiments. The focus of the labs is on working with experimental setups and learning techniques for data collection, analysis, interpretation, and presentation of experimental results.

Website:

- Website is accessed via Virtual campus (**Brightspace**):

<https://uottawa.brightspace.com/d2l/home>

- The Brightspace lab site will be **separate** from your course's web site and contains the schedule as well as experiment tutorials, manuals, reports, and pre-lab tests.

Location & time:

- **STEM Complex 3rd floor** (south tower), **Tuesdays and Wednesdays**

Afternoon session: **1:00 – 3:50 pm**

- Directions: turn right when exiting the elevators or turn left when coming up the central staircase to enter the STEM 3rd floor south tower.

Schedules:

- Check Brightspace Lab under schedule – please read your schedule carefully!

- Your lab group is the number after PHY 1122 and before LAB in your uoCampus.

Group A01 – Tuesdays

Group A02 – Wednesdays

- Your **first lab session** will **May 23 or 24**.

Evaluation:

- The laboratory component is worth 20% of your physics course mark.

- There are 5 lab experiments in the semester (one session every two weeks).

- Please print and bring the lab report template to your lab session (from Brightspace)!

Lab rules:

- Safety: Please wear closed-toe shoes. Lab coats and goggles are not required.

- **No eating or drinking in the labs.**

Contact:

Lab staff email: phylab@uottawa.ca

Service counter: beside STM 377

For any problems with Brightspace, absences, make-up labs or other serious issues, you may contact the lab manager:

Dr. Michael Wong

Office: STM 368

Phone: (613) 562-5800 x 2323

Email: mwong@uottawa.ca