
PHYS 102 - COURSE OUTLINE

INSTRUCTOR: Andrew MacMillan

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OFFICE LOCATION: YukonU Research Centre

CLASSROOM: A2605, labs in A2702

TIME: Tues/Thurs, 9 – 10:20 am; **Lab:** Mon. 1:00 – 3:50 PM

DATES: Jan. 7 – Apr. 10, 2025

COURSE DESCRIPTION

Physics 102 is a calculus-based first-year university level physics course intended for students planning on a career in the physical sciences or engineering. Topics covered include: Coulomb's law, electric fields, Gauss' law, electric potential, capacitance, current, resistance, magnetic fields, Ampere's and Faraday's laws with applications, inductance, and LC oscillations. Labs involve quantitative physics experiments with due recognition of systematic and random errors.

Physics 101 and Physics 102 together constitute a full course and satisfy requirements for 6 credits of first-year physics in the science degree programs at most Canadian universities.

COURSE REQUIREMENTS

Physics 101, Math 101 is a co-requisite. Students can discuss missing requirements with the instructor prior to registering.

EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at:

<https://www.yukonu.ca/admissions/transfer-credit>

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to,

- Explain and be able to describe fundamental physics concepts, such as oscillations, Coulomb's Law and Electric charge, electric fields, Gauss' Law, current, resistance, circuits and magnetic fields
- Apply critical thinking skills to interpret and solve real world-based problems related to the above physics principles, and
- Demonstrate basic laboratory skills needed for classical physics investigations and experiments, including interpreting experimental results in relation to the objectives.

COURSE FORMAT

Weekly breakdown of instructional hours

Lectures: 3 hours per week

Labs: 3 hours per week

Classes are a blend of lecture and tutorial allowing for an opportunity to practice solving calculation-based problems related to the material being covered in class. *Students with the prerequisites and a relevant background in Math and Physics can expect to spend between two and four hours in preparation and study for every hour spent in class.*

Labs are a mandatory component of the course. In order to receive a passing grade in the lab, a student must complete the experiments and submit the required reports. If a lab period is missed, the report for that experiment cannot be submitted unless arrangements are made with the instructor. Expectations for the labs are outlined in the lab manual.

Delivery format

In-person, additional will be posted on the YukonU Moodle site. On the Moodle site will be items such as lecture notes, quizzes, practice assignments, course announcements, suggested practice problems, and other useful or interesting material related to the course.

EVALUATION

Reading quizzes	10%
In-class quizzes	15%
Midterm Test	15%
Final Exam	30%
Laboratory	30%
Total	100%

Reading Quizzes (10%)

There will be weekly reading quizzes during the term, worth a total of 10% of the final grade. The quizzes will be based on the pre-lecture textbook readings and will focus on concepts. Missed quizzes cannot be made up, but the lowest quiz result will be discarded.

In-class quizzes (15%)

There will be in-class quizzes held during the term, worth a total of 15% of the final grade. I will notify you at least one lecture before a quiz is scheduled.

Midterm Test (15%)

There will be one midterm test held during the term, worth 15% of the final grade.

Final Examination (30%)

The final examination will cover the entire course and is worth 30% of the final grade. It will be held at the end of the term during the exam period. **A minimum mark of 50% on the final exam is required in order to pass the course.**

Laboratory (30%)

The laboratory component is worth 30% of the final grade. This will be based on lab performance and lab reports. The specific evaluation criteria for the lab are detailed in the lab manual.

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for important dates. <https://www.yukonu.ca/current-students/important-dates>

TEXTBOOKS & LEARNING MATERIALS

- Not required to purchase textbook. I will post lecture slides that follow the textbook content. Please review lecture slides for corresponding chapter before coming to class.
- Textbook slides are based on: Halliday D, Resnick R, Walker J. *Fundamentals of Physics*. Wiley, 2018.
- Laboratory Manual for PHYS 102 (handed out in the first lab period)
- Scientific calculator

ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website). It is the student's responsibility to seek these accommodations by contacting the Learning Assistance Centre (LAC): LearningAssistanceCentre@yukonu.ca.

TOPIC OUTLINE

Week	Dates	Chapter	Topic, Notes
1	Jan. 6-10	-	Course Intro & Review
2	Jan. 13-17	15	Oscillations & Simple Harmonic Motion
3	Jan. 20-24	21	Coulomb's Law & Electric Charge
4	Jan. 27-31	22	Electric Fields
5	Feb. 3-7	23	Gauss' Law
6	Feb. 10-14	24	Electric Potential
7	Feb. 17-21	-	READING WEEK
8	Feb. 24-28	25	Capacitance; Midterm exam (Date/time to be confirmed) (ch. 15, 21, 22, 23, 24)
9	Mar. 3-7	26	Current, Resistance, Simple Circuits
10	Mar. 10-14	27	Multiloop and RC Circuits
11	Mar. 17-21	28	Magnetic Fields
12	Mar. 24-28	29	Magnetic Fields Due to Currents

13	Mar. 31-Apr. 4	30	Induction & Inductance
14	Apr. 7-11	-	Special Topics/Review
	Apr. 17 1:00 0 4:00 PM		Final Exam (date and time to be confirmed) (Ch. 25, 26, 27, 28, 29, 30)

Specific dates of topic coverage and assessments may be subject to change.