Division of Applied Science & Management
School of Science
Winter, 2016

COURSE OUTLINE

PHYS 102

ELEMENTARY PHYSICS II

45 **HOURS**
3 **CREDITS**

PREPARED BY: Ernie Prokopchuk, Instructor DATE: November 4, 2015

APPROVED BY: Margaret Dumkee, Dean DATE: November 26, 2015

APPROVED BY ACADEMIC COUNCIL: (date)

RENEWED BY ACADEMIC COUNCIL: (date)

Division of Applied Science & Management
PHYS 102
Credit Course
Winter, 2016

PHYS 102 ELEMENTARY PHYSICS II

INSTRUCTOR: Ernie Prokopchuk, PhD

OFFICE HOURS: Friday 9:00 am – noon
**Open door policy is in effect*

OFFICE LOCATION: A2513

CLASSROOM: A2603

E-MAIL: eprokopchuk@yukoncollege.yk.ca

TIME: Tues & Thurs 2:30–4:30 (class)
Wednesday 1:00 – 4:00 (lab)

TELEPHONE: (867) 668-8865

DATES: January 7 – April 27, 2016

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 this semester are: 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 followed by Physics 102 constitute a full course and satisfy requirements for 6 credits of first-year physics in the science degree programs at most Canadian universities.

PREREQUISITES

Physics 101
Math 101 is co-requisite.

EQUIVALENCY OR TRANSFERABILITY

UBC	Phys 102 (3)	UAF	Phys 103X (3)
UNBC	Phys 101 (4)	UAS	Phys S103 (3)
UR	Phys 111 (3)	TRU	Phys 1200 (3)

SFU	SFU PHYS 102 (3) - Q/B-Sci; Yukon PHYS 101 & Yukon PHYS 102 = SFU PHYS 101 (3) - Q/B-Sci & SFU PHYS 102 (3) - Q/B-Sci & SFU PHYS 130 (0) - Q
UVIC	Phys 100 lev (1.5); Yukon Phys 101+102 = Phys 112 (3)

See the http://bctransferguide.ca/ for a complete list of transfers in British Columbia and http://alis.alberta.ca/ps/tsp/ta/tbi/onlinesearch.html for a complete list of transfers in Alberta.

LEARNING OUTCOMES

Upon successful completion of this course, students will:

- have an understanding of fundamental concepts of electricity and magnetism.
- have developed critical thinking skills.
- have developed basic laboratory skills.

COURSE FORMAT:

Classes are a blend of lecture and tutorial for 4 hours per week and labs are 3 hours per week.

Material is regularly posted on the course LMS. This material will include links to lecture capture videos, assignments, course announcements, suggested textbook problems, an exact copy of everything written on the screen during class, and other useful or interesting material related to the course.

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.

ASSESSMENTS

Assignments

There will be at least 8 assignments due on an approximately weekly basis. Assignments as a whole are worth 10% of the final grade which is determined based on the total mark obtained on all assignments. Assignments will involve a number of questions or problems related to the course material. You will have at least one week to complete each assignment. Late assignments will be penalized 10% for each day

late. Late assignments will not be accepted (receiving a mark of 0) once graded assignments have been returned to the class, which usually happens at the next class.

Tests

There will be two 60-minute term tests (February 2 and March 8, 2016) held during scheduled class time. Each test is worth 14% of the final grade. Please note that after the term tests the remaining class time will be used for a lesson. The final examination, worth 28% of the final grade, will take place during Final Exam period (April 13 – April 27). The exam date will be announced as soon as it is known.

"Question of the week"

Most weeks will be capped with a question relating to the material covered. The answer to the question will be submitted before leaving class. Each week will be weighted equally with only the eight best marks being counted towards 4% of the final grade.

Laboratory component

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

EVALUATION

Assignments	10%
Term Test 1	14%
Term Test 2	14%
Question of the week	4%
Final Exam	28%
Laboratory	30%
Total	100%

Students must pass (get at least 50%) both the laboratory and the lecture component in order to pass the course.

REQUIRED TEXTBOOKS AND MATERIALS

Halliday D, Resnick R, Walker J. Fundamentals of Physics. 9th ed. Hoboken (NJ): John Wiley & Sons, Inc..

Laboratory Manual for Physics 102 (available for the first lab period)

ACADEMIC AND STUDENT CONDUCT

While attendance is not graded, it is strongly recommended. There is usually a strong correlation between regular attendance and academic performance.

Information on academic standing and student rights and responsibilities can be found in the Academic Regulations:
http://www.yukoncollege.yk.ca//downloads/Yukon_College_Academic_Regulations_and_Procedures_-_August_2013_final_v1.pdf

PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

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 College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

TOPIC OUTLINE

Week	Chapter	Topic
0.5	21	Electric charge - conductors & insulators - Coulomb's law - quantization of charge - conservation of charge
1, 2	22	Electric fields - electric field lines - electric field due to point charge, dipole, line of charge, charged disk - point charge and dipole in an electric field
2,3	23	Gauss' law - flux - Gauss' law for isolated conductor - symmetry: cylinder, plane, sphere
4,5	24	Electric potential - electric potential energy - equipotential surfaces - potential and electric field - potential due to point charge, dipole, continuous charge distribution - potential of charged conductor
5,6	25	Capacitance - plates, cylindrical, spherical - capacitors in parallel and series - energy stored in electric field - dielectrics
7	26	Current & resistance - current density, drift speed - resistivity - Ohm's law - power in circuits - semiconductors and superconductors
8,9	27	Circuits - emf, work, energy - current and potential difference in single-loop and multi-loop circuits - resistance in parallel and series

		- RC circuits
10	28	Magnetic fields - magnetic field lines - crossed fields, the Hall effect - circulating charged particle - magnetic force on current-carrying wire - torque on current loop - magnetic dipole moment
11	29	Magnetic fields due to currents - straight, circular arc - force between parallel currents - Ampere's law - solenoids and toroids - coil as a magnetic dipole
12, 12.5	30	Induction and inductance - Faraday's law - Lenz's law - energy transfer - induced electric fields - RL circuits - energy stored in magnetic field - mutual induction

**Specific dates of topic coverage may be subject to change. Some topics may not be covered depending on time constraints.*