

DEPARTMENT Science

COURSE OUTLINE –WINTER 2024

PC1260 (A3): FLUIDS, FIELDS and RADIATION – 3 (3-0-3) UT 90 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR: GLENDA DELOS REYES, Ph.D.

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OFFICE: J220

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OFFICE HOURS: Tuesday 1:00 – 2:45 p.m.
Wednesday 11:00 – 1:00 p.m.

CALENDAR DESCRIPTION: This course is a continuation of PC1240 for students in the life and medical sciences. It includes fluid statics and dynamics, gases, kinetic interpretation; electrostatics, current and circuits; magnetic fields; electromagnetic induction; nuclear radiation, its interaction with matter and applications.

PREREQUISITE(S)/COREQUISITE: Physics 1240

REQUIRED TEXT/RESOURCE MATERIALS: PHYSICS Walker 5th Edition, Physics 1260 Lab Manual

DELIVERY MODE(S): 3 hours of lecture (TTh 10:00 – 11:20 a.m. J201)
3 hours of lab (Th 14:30-17:20 J103)

LEARNING OUTCOMES: Students will have the knowledge to be able to analyze (with algebra) the general behavior of fluids. Students will know and be able to explain the underlying principles associated with charge at rest plus the moving charges of basic electricity and magnetism and why simple circuits, electrical motors and generators behave as they do. The basics of radioactivity and the general products of fission and fusion will be understood.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page <http://www.transferalberta.ca>.

**** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability**

EVALUATIONS:

Assignment	10%	
*Midterm #1	15%	February 15 th
*Midterm #2	20%	March 28 th
Laboratory	15%	(Must get at least 50% in the lab to pass the course)
Final Exam	40%	Cumulative (Time and Location TBA by Registrar's office)

**The higher midterm mark will have 20% weight.*

NOTE: There will be no makeup or deferral available for any missed Quizzes, Tests or Labs. Lab reports must be submitted a week after the experiment and at the beginning of the class. Late lab reports will not be accepted. Students who missed the lab due to sickness/unavoidable reason will get the average class mark for the missed experiment.

Midterm Exams: Students are allowed a formula sheet (8.5 x 11 inch both sides) and calculator (any calculator WITHOUT communication features).

Final Exam: This exam is cumulative. Students are allowed the same items as for the midterm exam. Writing early is not permitted. No final exam for laboratory.

GRADING CRITERIA: (The following criteria may be changed to suite the particular course/instructor)

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines	Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	95-100	C+	2.3	67-69
A	4.0	85-94	C	2.0	63-66
A-	3.7	80-84	C-	1.7	60-62
B+	3.3	77-79	D+	1.3	55-59
B	3.0	73-76	D	1.0	50-54
B-	2.7	70-72	F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

NOTE: The course schedule is on myClass and may be updated there if necessary. This schedule is preliminary but gives a good idea of which sections in the textbooks you should read to be caught up with the class lectures.

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Date	Topic	Section in Walker
Jan 9	<i>Introduction & Lab Orientation</i>	
Jan 11	Fluid Statics	15-1, 15-2, 15-3, 15-4
Jan 16	Fluid Dynamics	15-5, 15-6, 15-7, 15-8, 15-9
Jan 17	<i>Lab 1– Fluid Properties</i>	
Jan 18	Coulomb’s Law, Insulators, Conductors	19-1, 19-2, 19-3
Jan 13	Electric Fields	19-4, 19-5, 19-6, 19-7
Jan 24	<i>Lab 2– Terminal velocity</i>	
Jan 25	Voltage , Potential difference	20-1, 20-2, 20-3
Jan 30	Capacitance, Capacitor circuits, Dielectrics	20-4, 20-5, 20-6
Jan 31	<i>Lab 3-Coulomb’s Law</i>	
Feb 1	Electric Current, Ohm’s Law, Power	21-1, 21-2, 21-3
Feb 6	Resistors in Series and Parallel, Complex Circuits	21-4, 21-8
Feb 7	<i>Lab 4- Inverse square Law RC Circuits</i>	
Feb 8	Kirchhoff’s Laws	21-5
Feb 13	RC Circuits	21-6, 21-7
Feb 14	<i>Lab 5- Mapping of Electric Fields</i>	
Feb 15	Midterm #1 Exam	
Feb 27	Magnets, Magnetic field forces	22-1, 22-2, 22-3, 22-8
Feb 28	<i>Lab 6- Capacitance</i>	
Feb 29	Ampere’s Law, Magnetic Field in Wires	22-4, 22-5, 22-6, 22-7
Mar 5	Induced EMF, Magnetic Flux	23-1, 23-2
Mar 6	<i>Lab 7- Resistance</i>	
Mar 7	Lenz and Faraday’s Laws	23-3, 23-4
Mar 12	Generators and Transformers, Inductors	23-6, 23-10, 23-7
Mar 13	<i>Lab 8- e/m for Electrons</i>	
Mar 14	RL Circuits, Energy Stored in Magnetic Field	23-5, 23-8, 23-9
Mar 19	AC Circuits	24-1, 24-2

Mar 20	Lab 9- Magnetic Fields	
Mar 21	RC and RL Circuits	24-3, 24-4,
Mar 26	RLC, Resonance, Phasors	24-5, 24-6
Mar 27	Lab 10- Balmer Series	
Mar 28	Midterm #2 Exam	
April 2	Nuclei, Radioactivity, Half- Life,	32-1, 32-2,
April 3	Radioactive Dating, Nuclear Binding Energy	32-3, 32-4
Apr 4	Nuclear Fission and Fusion	32-5, 32-6, 32-7
Apr 9	Fundamental Particles+ Forces	32-8, 32-9
Apr 11	Conclusion	

STUDENT RESPONSIBILITIES: Assignments must be handed in on time, and tests/exams must be written on the days announced in class. If an emergency prevents a student from writing a test/exam on the scheduled day, the student must contact the instructor immediately to make other arrangements. Otherwise, the student will receive a zero grade for that component of the course.

For more information, refer to the College Policy on Student Rights and Responsibilities at <https://www.gprc.ab.ca/about/administration/policies/fetch.php?ID=69>

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the Northwestern Polytechnic Calendar at <https://www.nwpolytech.ca/programs/calendar/> or the Student Rights and Responsibilities policy which can be found at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

**Note: all Academic and Administrative policies are available on the same page.