



**DEPARTMENT SCIENCE**

**COURSE OUTLINE –WINTER 2021**

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

**INSTRUCTOR:** GLENDA DELOS REYES, Ph.D.   **PHONE:** 780-539-2826  
**OFFICE:** J220   **E-MAIL:** [gdelosreyes@gprc.ab.ca](mailto:gdelosreyes@gprc.ab.ca)  
**OFFICE HOURS:** Tuesday & Thursday 1 – 5 pm (remote)

**WINTER 2021 DELIVERY:**

Mixed Delivery – Remote and Onsite. This course is delivered remotely with some face-to-face/onsite components at the GPRC [*Grande Prairie*] campus.

- For the remote delivery components: students must have a computer with a webcam and reliable internet connection. Technological support is available through [helpdesk@gprc.ab.ca](mailto:helpdesk@gprc.ab.ca).
- For the onsite components: students must supply their own mask [and/or face shield] and follow [GPRC Campus Access Guidelines and Expectations](#).

Note: GPRC reserves the right to change the course delivery.

**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 5<sup>th</sup> Edition, Physics 1260 Lab Manual

**DELIVERY MODE(S):** 3 hours of lecture (TR 8:30-9:50 remote) and 3 hours of lab (F 14:30-17:20 J103/remote)

**COURSE OBJECTIVES:** This course will provide a simple algebraic understanding of basic fluid statics and dynamics. The students will be shown how to draw and evaluate the basic constituents associated with simple electrical circuits. Applications will be presented for charges at rest and charges in motion. The relationship between electricity and magnetism will be presented and laboratory experiments will be conducted to verify the principles presented in class. Nuclear radiation and its behavior will be discussed with applications for the modern world.

**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:

Assignments	10%
Labs	15% (Must pass Lab (50%) to pass course)
*Midterm #1	10% February 9, 2021 (remote over Zoom)
*Midterm #2	20% March 16, 2021 (remote over Zoom)
Final Exam	45% Cumulative. Time and Location TBA by Registrar's Office

\* The higher midterm will be weighted 20% and the other midterm 10%.

**Midterm Exams:** Students are allowed a formula sheet (handwritten 8.5 x 11 inch both sides), a calculator (any calculator WITHOUT communication features) and pens or pencils and eraser. This is conducted remotely over Zoom. Students are required to download the internet locking browser to access the exam.

**Final Exam:** This exam is cumulative. Students are allowed the same items as for the midterm exam. This is conducted remotely over Zoom. Students are required to download the internet locking browser to access the exam.

### GRADING CRITERIA:

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	90-100	C+	2.3	67-69
A	4.0	85-89	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.

<b>Date</b>	<b>Topic</b>	<b>Section in Walker</b>
Jan 5	Introduction	
Jan 7	Fluid Statics	15-1, 15-2, 15-3, 15-4
Jan 12	Fluid Dynamics	15-5, 15-6, 15-7, 15-8, 15-9
Jan 14	Coulomb's Law, Insulators, Conductors	19-1, 19-2, 19-3
Jan 15	<i>Lab 1- Fluid Properties (remotely)</i>	
Jan 19	Electric Fields	19-4, 19-5, 19-6, 19-7
Jan 21	Voltage, Potential difference,	20-1, 20-2, 20-3,
Jan 22	<i>Lab 2- Terminal velocity</i>	
Jan 26	Capacitance, Capacitor circuits, Dielectrics	20-4, 20-5, 20-6
Jan 28	Electric Current, Ohm's Law, Power	21-1, 21-2, 21-3
Jan 29	<i>Lab 3-Coulomb's Law</i>	
Feb 2	Kirchhoff's Laws, Complex Circuits	21-4, 21-5, 21-8
Feb 4	RC Circuits	21-6, 21-7
Feb 5	Problem Set#1	
Feb 9	<b>Midterm #1 Exam</b>	
Feb 11	Magnets, Magnetic field forces	22-1, 22-2, 22-3, 22-8
Feb 12	<i>Lab 4- Inverse square Law</i>	
Feb 23	Ampere's Law, Magnetic Field in Wires	22-4, 22-5, 22-6, 22-7
Feb 25	Induced EMF, Magnetic Flux	23-1, 23-2
Feb 26	<i>Lab 5- Mapping of Electric Fields</i>	
Mar 2	Lenz and Faraday's Laws	23-3, 23-4, 23-5, 23-9
Mar 4	Generators and Transformers	23-6, 23-10
Mar 5	<i>Lab 6- Capacitance</i>	
Mar 9	Inductors	23-7, 23-8
Mar 11	Problem Set #2	
Mar 12	<i>Lab 7- Resistance</i>	
Mar 16	<b>Midterm #2 Exam</b>	
Mar 18	AC Circuits	24-1, 24-2
Mar 19	<i>Lab 8- e/m for Electrons</i>	
Mar 23	RC, RL and RLC Circuits	24-3, 24-4, 24-5
Mar 25	Resonance, Phasors	24-6
Mar 26	<i>Lab 9- Magnetic Fields</i>	
Mar 30	Nuclei, Radioactivity, Half- Life, Nuclear Binding Energy	32-1, 32-2, 32-3, 32-4, 32-5, 32-6
Apr 1	Applications, Fundamental Particles+ Forces	32-7, 32-8, 32-9
Apr 6 & 8	Problem Set #3, Conclusion	
Apr 9	<i>Lab 10- Balmer Series</i>	

**STUDENT RESPONSIBILITIES:**

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 College Calendar at <http://www.gprc.ab.ca/programs/calendar/> or the College Policy on Student Misconduct: Plagiarism and Cheating at <https://www.gprc.ab.ca/about/administration/policies>

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