



DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2017

PC 1260 FLUIDS, FIELDS AND RADIATION – 3.0 (3-0-3) UT (3) (90 HOURS)

INSTRUCTOR: Dr. Robert (Bert) **PHONE:** 780-539-2008
Hunt P. Eng., FEC,
FGC (Hons.)

OFFICE: C414 **E-MAIL:** bhunt@gprc.ab.ca

OFFICE HOURS: M 1-3 pm TR 2-3 pm WF 3 pm PC Lab in J103

PREREQUISITE(S)/COREQUISITE: PC1240

REQUIRED TEXT/RESOURCE MATERIALS: PHYSICS Walker 4th Edition

CALENDAR DESCRIPTION:

This course is a continuation of PC1240 for students in 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.

CREDIT/CONTACT HOURS: 3 hours lecture and 3 hours lab a week

DELIVERY MODE(S):

COURSE OUTLINE

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| Chapter 15 | Pressure, buoyancy, fluid flow and viscosity. |
| Chapter 19 | Charge, Coulomb's Law, electric field and conductors. |
| Chapter 20 | Electric potential, capacitance, dielectrics and applications. |
| Chapter 21 | Electric current, resistance, Ohm's Law, DC, AC and electrical energy. Resistors in series and parallel, Kirchhoff's Laws and hazards. |
| Chapter 22 | Magnetic fields, magnetic forces and current-carrying conductors. |
| Chapter 23 | Induction, Lenz's Law, generators and transformers. |
| Chapter 24 | Reactance, RLC circuits and resonance. |
| Chapter 32 | Nuclear energy, radioactivity, decay and applications. |

TRANSFERABILITY: It is a University of Alberta Transfer Course

** 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

GRADING CRITERIA:

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A⁺	4.0	90 – 100	EXCELLENT
A	4.0	85 – 89	
A⁻	3.7	80 – 84	FIRST CLASS STANDING
B⁺	3.3	77 – 79	
B	3.0	73 – 76	GOOD
B⁻	2.7	70 – 72	
C⁺	2.3	67 – 69	SATISFACTORY
C	2.0	63 – 66	
C⁻	1.7	60 – 62	
D⁺	1.3	55 – 59	MINIMAL PASS
D	1.0	50 – 54	
F	0.0	0 – 49	FAIL
WF	0.0	0	FAIL, withdrawal after the deadline

EVALUATIONS:	Assignments	15%	
	Laboratories	20%	
	Mid-Term Examination	20%	(Feb. 15/17)
	Final Examination	45%	(TBA)

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the College Admission Guide at <http://www.gprc.ab.ca/programs/calendar/> or the College Policy on Student Misconduct: Plagiarism and Cheating at www.gprc.ab.ca/about/administration/policies/**

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

LEARNING OBJECTIVES:

The Instructor will provide a simple algebraic understanding of the 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 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 and electrical motors and generators behave as they do. Comprehension of radioactivity and the general products of fission and fusion will be understood.

COURSE SCHEDULE/TENTATIVE TIMELINE:

Lecture	T R	8:30 - 9:50 a.m.	J202
Laboratory	W	2:30 - 5:20 p.m.	J103

LABORATORY COMPONENT

Lab #	Content	Day
11	Fluid Properties	Jan. 11
12	Terminal Velocity	Jan. 18
13	Coulomb's Law	Jan. 25
Handout	Inverse Square Law	Feb. 1
14	Mapping of Electric Fields	Feb. 8
15	Capacitance	Mar. 1
16	Simple Electric Currents	Mar. 8
17	e/m for Electrons	Mar. 15
18	Magnetic Fields	Mar. 22
Handout	Balmer Series	Mar. 29