NORTHWESTERN POLYTECHNIC

DEPARTMENT of Science

COURSE OUTLINE – Fall 2025

PC1240 (A2): Particles and Waves – 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	**PHONE:**	(780) 539-2985
OFFICE:	J216	**E-MAIL:**	gdelosreyes@nwpolytech.ca
OFFICE HOURS:	Monday 11:00 – 13:00 & Thursday 13:00 – 16:00 or drop-in whenever my office door is open.		

CALENDAR DESCRIPTION: *Algebra-based course primarily for students in life, environmental, and medical sciences. It guides the students through two distinct types of motions: motion of matter (particles) and wave motion. Vectors, forces, bodies in equilibrium, review of kinematics and basic dynamics; conservation of momentum and energy; circular motion; vibrations; elastic waves in matter; sound; wave optics; black body radiation, photons, de Broglie waves. Examples relevant in environmental, life, and medical sciences will be emphasized.*

PREREQUISITE(S): *Physics 20 or equivalent, Mathematics 30-1 or equivalent. Physics 30 is strongly recommended.*

REQUIRED MATERIALS: *PHYSICS by Walker 5th Edition,*
Physics 1240 Lab Manual

DELIVERY MODE(S): *Lectures A2 T&R 11:30 – 12:50 J204*
Laboratory L1 W 14:30 – 17:20 J103

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LEARNING OUTCOMES: *Upon successful completion, a student is expected to have:*

- *Reasonable understanding of concepts of kinematics, vectors, Newton's Laws, energy, rotational motion, oscillatory motion, superposition of waves, sound and electromagnetic waves.*
- *Experience with common mathematical and experimental tools, including problem solving for this course.*

TRANSFERABILITY: *Please consult the Alberta Transfer Guide for more information. You may check the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.alberta.ca.*

*** For courses with alpha (letter) grading, a 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:

Reading Quizzes	*10%*
Content Quizzes	*20%*
Laboratory	*20%*
Midterm Exams (2)	*20%*
Final Exam	*30%*

Reading Quizzes: *Reading quizzes will be given every week (10 quizzes in total) and due at 11:59 pm on Mondays. The quizzes are delivered directly through MyClass. Reading quizzes cover topics that will be discussed the following meetings. Each reading quiz will consist of multiple-choice questions about the read material. Only 9 out of 10 quizzes will be recorded. This implies that you are automatically excused from ~10% of Reading Quiz marks.*

Content Quizzes: *There will be 10 online quizzes that examine your knowledge of the course material. The quizzes are delivered directly through MyClass and will be due Fridays before 11:59 pm. Each quiz is weighted evenly in calculating your final Content Quiz Mark. Each quiz is 30 minutes – 1 hour and you can complete it between 11:59 pm Thursday to 11:59 pm Friday. You are only allowed one attempt and must finish the quiz once you started it. The quiz format is similar to midterm and final exams.*

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Laboratory: *This course has a lab component and an integral part of PC1240. You must get a score of at least 50% in the laboratory component of the course to pass PC1240. If you fail the lab, the whole course is automatically failed, independently on how well you did in the lecture part.*

Midterm Exams*: There will be two midterm exams, which will be weighted equally. The midterm exams will be given during regular class time and the dates for the midterm exams are in the Course Timeline.* ***If you missed one or both midterms for any reason, the weight of the missed midterm exam(s) will be automatically added to the final exam weight.*** *The midterm exam will consist of multiple choice and written response questions (problem solving questions that you need to show your complete solution). The midterm exams are closed book (notes) and you are only allowed to use a calculator and a formula sheet that is available on MyClass. You need to print the formula sheet prior to the midterm exam schedule.*

Final Exam: *The final exam is 3-hour long and composed of multiple choice and written response questions. It will be cumulative, testing all the materials from the lecture course. The same rules that apply for the Midterm exams will also apply for the Final exam. The final exam for lecture will be written during the exam period, between December 13 and December 20 inclusive (including Saturdays and evenings). Writing early is not permitted. Student must arrive on time, as no extension will be given to any late student. A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons can apply to write a deferred final examination. Such application must be made to the Office of the Registrar within 48 hours of the missed examination.*

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.*

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

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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

Grades for this course will be assigned as a percentage. The minimum passing grade is 60%.

COURSE SCHEDULE/TENTATIVE TIMELINE: *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.*

Week	Dates	Topic	Readings	Reading Quiz due (11:59 pm)	Content Quiz Due (11:59 pm)
1	Sept 4	Part 1: Introduction and Review 1D Motion	Chap 1		
2	Sept 9 &11	Part 1: Cont. of Review of 1D Motion	Chap 2&3	Sept 8	
	Sept 10	Lab Orientation			
3	Sept 16 & 18	Part 2: 2D Kinematics	Chap 4	Sept 15	Sept 19 (part1)
	Sept 17	Lab 1: Graphing and Spreadsheets			
4	Sept 23 & 25	Part 3: Newton's Laws	Chap 5	Sept 22	Sept 26 (part 2)
	Sept 24	Lab 2: Acceleration due to Gravity			
5	Sept 30 &Oct. 2	Part 4: Applications of Newton's Laws	Chap 6	Sept 29	Oct 3 (part 3)
	Oct 1	Lab 3: Projectile Motion			
6	Oct 7 & 9	Part 5: Work and Kinetic Energy	Chap 7	Oct 6	Oct 10 (part 4)

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	Oct 8	Lab 4 Human Arm			
7	Oct 14 & 16	Part 6: Conservative Forces and Potential Energy	Chap 8		**Midterm 1, Oct 16**
8	Oct 21 & 23	Part 7: Linear Momentum	Chap 9	Oct 20	Oct 24 (part 5)
9	Oct 28 & 30	Part 8: Rotational Motion	Chap 10	Oct 27	Oct 31 (part 6)
	Oct 29	Lab 5: Springs 1			
10	Nov 4 & 6	Part 9: Rotational Dynamics & Statics	Chap 11	Nov 3	Nov 7 (part 7)
	Nov 7	Lab 6: Springs 2			
11	Nov 11 & 13	**Fall Break**			Nov 14 (part 8)
12	Nov 18 & 20	Part10: Gravity	Chap 12		**Midterm 2, Nov 20**
13	Nov 25 & 27	Part 11: Simple Harmonic Motion	Chap 13	Nov 24	Nov 28 (part 9)
	Nov 26	Lab 7: Speed of Sound			
14	Dec 2 & 4	Part 12: Waves and Sound	Chap 14 & 28	Dec 1	Dec 5 (part 10)
	Dec 3	Lab 8: Diffraction			
15	Dec 9 & 11	Part 13: Quantum Mechanics	Chap 30		

STUDENT RESPONSIBILITIES: *Quizzes/exams must be written on the days announced in class. If an emergency prevents a student from writing the 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.nwpolytech.ca/about/administration/policies/fetch.php?ID=69

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available https://www.nwpolytech.ca/about/polytechnic-leadership/policies-directory.

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

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