GPRC

DEPARTMENT OF ACADEMIC UPGRADING
COURSE OUTLINE FALL 2015
PHYSICS 0120 5(4 – 0 – 2)
PC 0120 A2 PHYSICS GRADE 11 EQUIVALENT

Instructor	NANCY FRASER	**Phone**	539 – 2980
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Office Hours	AS POSTED ON MY OFFICE DOOR.		

PREQUISITES/COREQUISITE(S):   MA 0110, & SC 0110 or PC 0110/ MA 0120

A minimum grade of 60 % in Ma 0110 and PC 0110 is recommended.

REQUIRED TEXT/RESOURCE MATERIAL: **College Physics by Wilson 7TH Edition (any edition is OK but course outline goes with the 7th edition is the current edition)**

– Lab notebook (250 page coiled notebook is fine do not spend the money on a real lab notebook)
– **Non**programmable calculator – this is the only electronic devise allowed during tests or exams.
– 10 quad to 1 cm graph paper are also required.

SUPPLEMENTARY TEXTS: *These textbooks are available in the library*

1. Elements of Physics by Smith and Copper (1979) (Especially good for waves.)
2. Physics: Principles and Problems, by Zitzewitz (any edition)
3. Modern Physics by Trenklein (1990, and 1994)

CALENDAR

DESCRIPTION: The topics to be covered include: linear and two dimensional velocity, acceleration, forces; vector verses scalar quantities from mathematical and graphical perspectives; Newton's three laws of motion; equilibrium forces, incline planes; centripetal force and acceleration, Kepler's three laws of planetary motion, Newton's law of gravity; work, power kinetic, gravitational potential and conservation of energy; transverse and longitudinal waves and interference of waves, resonance and Doppler effect.

CREDIT/CONTACT HOURS: This is a 5 credit course and meets 6 hours per week (4 hour lecture and 2 hours lab).

DELIVERY MODE(S):   Lecture will be the main method of delivery. There will also be several experiments throughout the course.

OBJECTIVES:

The following are the topics that I be covering in this course:

1.   review of formulae from SC 0110.
2.   how to solve problems mathematically and graphically.
3.   review trigonometry required to add vectors.
4.   2-dimensional displacement, velocity, and acceleration.
5.   how to add vectors using components.
6.   how to draw vector diagrams.
7.   Newton's three laws of motion.
8.   how to solve related problems and draw vector diagrams.
9.   centripetal acceleration and centripetal force.
10.   how to solve related problems.
11.   Kepler's three laws of planetary motion. Explain why February is the shortest month of the year.
12.   Derive Newton's Law of Gravitation.
13.   how to solve related problems.

14. explain and derive equations related to work, power, kinetic energy, potential energy and the conservation of energy.
15. how to solve related problems.
16. explain waves.
17. define and distinguish between transverse and longitudinal wave.
18. give examples of each.
19. draw and label parts of the wave and define each part.
20. discuss and define reflection, refraction and diffraction of waves.
21. draw and label diagrams illustrating reflection, refraction and diffraction of waves.
22. discuss and define constructive and destructive interference of waves.
23. discuss and define beats and resonance.
24. discuss resonance in general and resonance in an open and closed air column.
25. discuss and draw a diagram illustrating Doppler effect with a stationary listener and a moving sound source; and then with a stationary sound source and a moving listener.
26. the proper way to conduct oneself in a laboratory situation.
27. how to write up a formal lab report.

OUTCOMES:

Students should

1. understand theory, memorize formulae related to kinematics and be able to solve problems in which acceleration is constant.
2. be able to interpret and draw x-t, v-t, and a-t graphs.
3. be able to do calculations from x-t, v-t, and a-t graphs.
4. understand theory related to relative velocity and be able to solve related problems.
5. be able to add vectors using the component method.
6. understand theory, memorize formulae related to projectile motion and be able to solve related problems.
7. understand theory, memorize formulae related to Newton's three laws of forces and be able to solve related 2–dimensional problems.
8. understand theory, memorize formulae related to use work, power, and energy and solve related problems.
9. understand theory, memorize formulae related to centripetal motion and be able to solve related problems.

10. understand theory, memorize formulae related to Newton's Law of Gravitation and be able to solve related problems.
11. understand theory, memorize formulae related to waves: water, and sound be able to solve related problems.
12. understand theory, memorize formulae related to reflection, refraction, diffraction and interference of each type of wave and be able to solve related problems.
13. understand theory, memorize formulae related to Doppler Effect, beats, resonance, supersonic velocities, shock waves and be able to solve related problems.

TRANSFERABILITY: ** 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: Regular attendance is expected of all students, and is crucial to passing this course. Students who miss classes will soon find themselves falling behind and failing. Lateness will **not** be tolerated as it interrupts the instructor and fellow classmates. As per Department Policy, if you miss more than 10 per semester of classes in any course, you may be debarred from the final exam for that course.

If a student is going to miss a test or midterm he/she **must** contact the instructor prior to the test or midterm in order to be considered for a rewrite. There may be a deduction of 10% for test rewrites. A certificate (a doctor's or a note from the funeral home) will be required to make up the final exam. **You will receive a grade of F if you do not write the final exam.**

Laboratory attendance to each specific experiment is compulsory. There are <u>NO</u> 'makeup' labs in this course. Missed labs will result in a grade of 0 %.

Penalties for late **complete assignments** are as follows: (Assuming that I have not returned the marked assignments)

1 day late – 20%, 2 days late – 50%, 3 days late – 100%

Late **partial assignments** are not accepted.

Penalties for late **lab reports** are as follows:
5 minutes after due time - 10 %, 24 hours after due time - 100%

Marking Scheme:

Complete Assignments:	5%
Partial Assignments:	5%
Labs	15%
Major test	20%
Tests	15%
Final Exam	40%
Total	100%

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	**4-point Equivalent**	**Percentage Guidelines**	**Designation**
A$^+$	4	90 – 100	**EXCELLENT**
A	4	85 – 89	
A$^-$	3.7	80 – 84	**FIRST CLASS STANDING**
B$^+$	3.3	77 – 79	
B	3	73 – 76	**GOOD**
B$^-$	2.7	70 – 72	
C$^+$	2.3	67 – 69	**SATISFACTORY**
C	2	63 – 66	
C$^-$	1.7	60 – 62	
D$^+$	1.3	55 – 59	**MINIMAL PASS**
D	1	50 – 54	
F	0	0 – 49	**FAIL**
WF	0	0	**FAIL, withdrawal after the deadline**

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It is recommended that you have a grade of 60 % or better to continue to PC 0130.

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STUDENT RESPONSIBILITIES:

Students will:

– review material that is prerequisite to this course quickly so it does not slow you down. (See Assumed Background Knowledge on pages 2 & 3. Especially the section on nomenclature.)

– be at class regularly and on time. (If you miss more than 10 per semester of classes in any course, you may be debarred from the final exam for that course.)

– complete all pre class and pre-lab assignments before arriving in class.

- keep up with course material.
- if experiencing difficulties with course get help immediately.
- catch up on missed material before the next class.
- provide documentation for missed midterms or finals.
- be aware of penalty for failing the lab component and not writing the final.

STATEMENT ON PLAGIARISM AND CHEATING:

Please refer to pages 50 – 51 of the College calendar regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely. The College calendar is available on line.

COURSE SCHEDULE/TENTATIVE TIME LINE:

Days	Topic	Required Reading
2	Review metric conversion, and significant figures	Chapter 1
6	*Kinematics 1-dimension (Formulae and Graphically)	Chapter 2
3	Vector addition (omit Triangular Method and vector subtraction)	Pgs 68 – 79
2	Relative velocity	Pgs 88 – 94
2	**Projectile motion (Kinematics 2 – dimensions)	Pgs 80 – 88
8	*** Newton's three laws of forces***	Pgs 103 – 132
1	Work, power	Pgs 141 – 147, 166 – 168
1	Energy	Pgs 150 – 166
2	Centripetal motion	Pgs 228 – 235

1	**Newton's Law of Gravitation, Kepler's Three Laws	Pgs 238 – 251
1	Define waves and elasticity (In this section you will NOT be responsible for all the formulae. You are responsible for the concepts.)	Pgs 455 – 470
1	Hooke's law, period of a simple pendulum, simple harmonic motion	Pgs 456 – 470
3	Transverse waves, reflection, refraction, diffraction interference, principle of superposition as they relate to water waves.	Pgs 470 – 479 450 – 460
8	Sound: Definition, speed of sound in air, reflection, refraction, diffraction Interference of sound: principle of superposition beats, resonance in open and closed air columns, 2-point interference, as they relate to sound waves.	Pgs 471– 521
1	Doppler effect	Pgs 507 – 510
1	Supersonic velocities	Pgs 510 – 512

* Test 1

** Test 2

*** Midterm***