

Grande Prairie Regional College

Department of Science

PC 1310 A3 – Mechanics

Winter Session, 2009

4.3(3-1-1.5)UT

U of A Equivalent – ENPH 131

Course Outline

Kinematics and dynamics of particles; gravitation; work and energy; linear momentum; angular momentum; systems of particles; introduction to dynamics of rigid bodies are covered in the course.

Prerequisite: MA 1000, EG 1300

Corequisite: MA 1010, Pre- or Co-requisite: PC 1300

Note: Restricted to engineering students only.

Instructor	Tanvir Sadiq, Ph.D., P.Eng. J209 780-539-2865 tsadiq@gprc.ab.ca												
Lecture	TR 08:30 – 09:50 J201												
Laboratory	F 14:30 – 17:20 J103												
Seminar	R 13:00 – 13:50 J203												
Textbooks	<i>Engineering Mechanics, Statics and Dynamics, 11th Edition</i> R. C. Hibbeler, Prentice Hall <i>University Physics, 12th Edition</i> Hugh D. Young and Roger A. Freedman, Pearson/Addison-Wesley												
Laboratory Manual	<i>Physics 130, En Ph 131 Laboratory Manual</i> Department of Physics, University of Alberta												
Marks Distribution	<table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Class Participation</td> <td style="text-align: right;">2%</td> </tr> <tr> <td>Problem Sets</td> <td style="text-align: right;">5%</td> </tr> <tr> <td>Seminars</td> <td style="text-align: right;">10%</td> </tr> <tr> <td>Laboratory Work</td> <td style="text-align: right;">20% (Must pass the lab to pass the course.)</td> </tr> <tr> <td>Midterm Exam</td> <td style="text-align: right;">25% - (3 March 2008)</td> </tr> <tr> <td>Final Exam (Comprehensive)</td> <td style="text-align: right;">38%</td> </tr> </table> <p><i>Note that satisfactory performance on the final exam and the aggregate mark is required in order to pass this course. "Satisfactory performance" is defined by University of Alberta every year.</i></p>	Class Participation	2%	Problem Sets	5%	Seminars	10%	Laboratory Work	20% (Must pass the lab to pass the course.)	Midterm Exam	25% - (3 March 2008)	Final Exam (Comprehensive)	38%
Class Participation	2%												
Problem Sets	5%												
Seminars	10%												
Laboratory Work	20% (Must pass the lab to pass the course.)												
Midterm Exam	25% - (3 March 2008)												
Final Exam (Comprehensive)	38%												
Office Hours	1130 – 1330 T, W & R, Or by appointment (I am also around some evenings except when I have an evening class)												

Laboratory Work

Experiment No.	Week of	Title
6	January 18/25	Acceleration Due to Gravity
7	February 1/8	Non-Uniform Motion
8	February22/March 1	Atwood's Pulley
10	March 8/15	Collision: Ramp
11	March 22/29	Moment of Inertia (Lab instructions to be provided)

Note: *Lab reports are due at the end of the lab period. Late reports will not be accepted and will receive zero marks. There will be no exception to this rule. Graded reports will not be returned before all the lab sections have submitted their reports.*

Prerequisite, Seminars, Assignments and/or Reports

Prerequisite: A good background in Calculus (including Integral and Vector Calculus) is required for this course. Students are also expected to have a fairly good knowledge of trigonometry.

Seminars[#]: These are approximately one hour sessions held weekly in which students will be required to solve several problems. The problems will be handed in at the end of the seminar period for marking. **Late submissions will not be accepted and will receive zero mark.** Limited help in solving these problems will be available from the seminar instructor. The first seminar begins the week starting January 11, 2009. Last seminar will not be graded, however, solution will be posted.

Assignments[#]: There will be several assignments throughout the semester, each consisting of a number of problems. Due dates will be announced in the class. There will be approximately one assignment weekly. **Late assignments will NOT be accepted and will receive zero mark.** All assignments MUST be written neatly and submitted on 8.5 x 11 in. (Letter size) Engineering paper. All answers should be boxed. Leave space between problems. Format to solve a problem will be explained in the class and we will strictly adhere to the given format.

Laboratory: There are six lab sessions which introduce the student to the experimental process and report writing. Students must achieve a score of at least 50% in the lab component of the course in order to obtain an overall passing grade in PC1310. Students who achieve a grade of at least 65% in the lab, but fail the remaining parts of the course may not have to repeat the lab.

Midterm Exam: The midterm will be 1½ - 2 hours long (exact duration TBD), and is a closed-book, closed-notes exam with the formulae sheet provided by the instructor. Date and location will be announced in class. **There will be NO make-up midterm exam.**

Final Exam: The final exam will be comprehensive and 3 hours long. The final exam is a closed-book, closed-notes exam with the formulae sheet provided by the instructor. Date and location will be announced by the College. **There will be NO make-up final exam.**

[#] See "PC 1310 Assignment Requirements" provided separately for more information.

Lecture Topics

Topic	Sections in Hibbeler	Equivalent sections in Young & Freedman
Introductory Material	1.1 – 1.5	1.3 – 1.5
Kinematics of Rectilinear Motion	12.1 – 12.3	2.1 – 2.6
Kinematics of Planar Motion	12.4 – 12.7, 12.9, 12.10	3.1 – 3.5
Dynamics of a Particle	13.1, 13.2, 13.4, 13.5	4.1 – 4.6
Systems of Particles	13.3, 9.1, 9.3	5.1 – 5.5
Work and Energy	14.1 – 14.6	6.1 – 6.4, 7.1 – 7.3
Linear Momentum and Impulse	15.1 – 15.4	8.1 – 8.5
Introduction to Dynamics of a Rigid Body	16.1 – 16.3, Parts of Ch 17	9.1 – 9.6, 10.1 – 10.4
Angular Impulse and Momentum	15.5 – 15.7	10.5 – 10.6

Grades

<i>Letter Grade</i>	<i>4-Point Equivalent</i>	<i>Designation</i>
A+	4.0	Excellent
A	4.0	
A-	3.7	First Class Standing
B+	3.3	
B	3.0	Good
B-	2.7	
C+	2.3	Satisfactory
C	2.0	
C-	1.7	
D+	1.3	Minimal Pass
D	1.0	
F	0.0	Fail

The University of Alberta will only accept for transfer credit courses where a student obtains a grade of **C-** or higher.