

# GRANDE PRAIRIE REGIONAL COLLEGE

## DEPARTMENT OF SCIENCE

PC 1310 – Mechanics, 4.3 (3-1-1.5) UT

U of A Equivalent – ENPH131

WINTER SEMESTER 2010 - 2011

### COURSE OUTLINE

Lecture	Section A3	T R	8:30 - 9:50	Room J201
Labs	Section L1	F	14:30 - 17:20	Room J103 and J101
Seminar	Section S1	R	13:00 – 13:50	Room J202

**INSTRUCTOR:**

**Dr. Desh Mitra**

**Office: J215**

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**TRANSFER CREDIT:**

U. of Alberta	PC 131	82 Hours
U. of Calgary	GLGY 201	3 credits
U. of Lethbridge	GEOL 2060	3 credits
Athabasca Univ.	GEOL 200	6 credits

**OBJECTIVE**

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:**

**MA1000, EG1300**

**Co-requisite:**

**MA1010 Pre- or Co-requisite: PC1300**

**Note:**

*Restricted to engineering students only.*

**TEXTBOOKS**

**Engineering Mechanics**, Statics and Dynamics, 12<sup>th</sup> Edition  
by R. C. Hibbeler, Pearson/Prentice Hall

**University Physics**, 12<sup>th</sup> Edition

by Hugh D. Young and Roger A. Freedman, Pearson/Addison-Wesley

**LAB BOOK**

**Phys 130/En Ph 131 Laboratory Manual**

Department of Physics, University of Alberta

### Lecture Topics

Topic	Sections in Hibbeler	Sections in Young & Freedman
Introductory Material	Chapters 1 & 2	Chapter 1
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, 8.1	4.1-4.6, 5.1
Systems of Particles	13.3, 9.1, 9.3	5.2-5.5
Work and Energy	14.1-14.6	6.1-6.4, 7.1-7.4
Linear Momentum and Impulse	15.1-15.4	8.1-8.5
Introduction to Dynamics of a Rigid Body	16.1-16.3, 17.1-17.4	9.1-9.3, 10.1-10.3
Angular Impulse and Momentum	15.5-15.7	10.5-10.7

## Laboratory Component

Experiment No.	Week of	Title
6	January 7/14	Acceleration Due to Gravity
7	January 21/28	Non-Uniform Motion
8	February 4/11	Atwood's Pulley
9	February 18/March 4	Conservation of Mechanical Energy
10	March 11/18	Collision: Ramp
11	March 25/April 8	Moment of Inertia

## 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. There will be no exception to this rule.** Limited help in solving these problems will be available from the instructor. The first seminar begins the week starting January 13, 2011.

**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. There will be no exception to this rule.** 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.

**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 makeup midterm exam.** If you miss the midterm, your final exam weight will be equal to the combined weight of midterm and regular final 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 makeup final exam.**

**Note:** (1) *If I cannot read your work, I cannot grade it. Please write neatly and legibly.*  
 (2) *A correct answer without a correct solution will not carry any grade. I do not award marks for writing irrelevant stuff. For more info see separate sheet provided today.*

**Last Day of Classes: April 12, 2011**

**Marks Distribution**

Assignments	10%
Seminars	10%
Laboratory	20% (Note: Student must pass lab component to pass the course)
Midterm	25%
Comprehensive Final Exam	35%

**Grade Distribution:**

<i>Descriptor</i>	<i>Grade</i>	<i>Points</i>	<i>Descriptor</i>	<i>Grade</i>	<i>Points</i>
<i>Excellent</i> <i>84 – 100%</i>	<i>A+</i>	<i>4.0</i>	<i>Satisfactory</i> <i>60 – 71 %</i>	<i>C+</i>	<i>2.3</i>
	<i>A</i>	<i>4.0</i>		<i>C</i>	<i>2.0</i>
	<i>A-</i>	<i>3.7</i>		<i>C-</i>	<i>1.7</i>
<i>Good</i> <i>72 – 83 %</i>	<i>B+</i>	<i>3.3</i>	<i>Poor</i>	<i>D+</i>	<i>1.3</i>
	<i>B</i>	<i>3.0</i>	<i>Minimal Pass</i>	<i>D</i>	<i>1.0</i>
	<i>B-</i>	<i>2.7</i>	<i>Fail</i>	<i>F</i>	<i>0</i>

Note: Other institutions may not consider grades of **D** sufficient to award transfer credit.

**Note** - All books and materials are available at the Bookstore