



**DEPARTMENT OF SCIENCE
COURSE OUTLINE – WINTER 2012**

PC 1310 A3 – MECHANICS – 4.3(3-1-3/2) UT

INSTRUCTOR: Tanvir Sadiq, PhD, P.Eng. **PHONE:** 780.539.2865
OFFICE: J209 **E-MAIL:** tsadiq@gprc.ab.ca
OFFICE HOURS: TBA or By Appointment

PREREQUISITE(S)/COREQUISITE: MA 1000, EG 1300, PC 1300/MA 1010, PC 1300
(NOTE: RESTRICTED TO ENGINEERING STUDENTS ONLY)

REQUIRED TEXT/RESOURCE MATERIALS:

Engineering Mechanics, Statics and Dynamics, 13th Ed., R. C. Hibbeler, Prentice Hall
Fundamentals of Physics, 9th Ed., Authors: Halliday, Resnick & Walker, Wiley
Physics 130/ En Ph 131 Laboratory Manual, Dept. of Physics, University of Alberta

CALENDAR DESCRIPTION: 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.

CREDIT/CONTACT HOURS: PC1310 is a 4.3 credit University Transfer course. There will be two lectures and a seminar every week. Each lab will be approximately three-hour long.

DELIVERY MODE(S):

| | | | |
|-----------|--------|-------------|-----------|
| LECTURES: | WF | 1300 – 1420 | J228 |
| SEMINAR: | R (S1) | 1300 – 1350 | J228 |
| | T (S2) | 1600 – 1650 | J228 |
| LAB: | F | 1430 – 1720 | J103/J107 |

TRANSFERABILITY:

University of Alberta, University of Calgary, University of Lethbridge, Athabasca University, Augustana Faculty - University of Alberta, Concordia University College, Canadian University College, King's University College. Other (transfers in combination with other courses or to other institutions)

** 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:

| | |
|----------------------------|--|
| HW/Quizzes | 10% |
| Seminars | 5% |
| Laboratory Work | 15% (Must pass the lab to pass the course) |
| Midterm Exam | 25% (1 March 2013, possibly an evening exam) |
| Final Exam (Comprehensive) | 45% (Date and Location TBA) |

STUDENT RESPONSIBILITIES: Students are responsible for all lecture, seminar and lab material, and readings. Students are expected to practice the material by doing textbook examples as well as problems at the end of every section covered.

COURSE SCHEDULE:

Lecture Topics

| Topic | Sections in Hibbeler | Equivalent sections in HRW* |
|---|-----------------------------------|-----------------------------|
| Introductory Material | 1.1 – 1.5 | 1.1 – 1.7 |
| Kinematics of Rectilinear Motion | 12.1 – 12.3 | 2.1 – 2.10 |
| Kinematics of Planar Motion | 12.4 – 12.7, 12.9, 12.10 | 4.1 – 4.9 |
| Dynamics of a Particle | 13.1 - 13.5 | 5.1 – 5.9, 6.1 – 6.5 |
| Work and Energy | 14.1 – 14.6 | 7.1 – 7.9, 8.1 – 8.8 |
| Linear Momentum and Impulse | 15.1 – 15.4 | 9.1 – 9.12 |
| Angular Impulse and Momentum | 15.5 – 15.7 | 11.7 – 11.11 |
| Introduction to Kinematics and Dynamics of a Rigid Body | 16.1 – 16.3, 17.1 – 17.5, 18.1 | 10.1 – 10.6, 11.1 – 11.6 |

* Note: Corresponding sections from “Fundamentals of Physics”, 9th Ed. by Halliday, Resnick & Walker (HRW) are listed as an additional reference since most students have this text from PC 1300.

Laboratory Work

| Experiment No. | Title |
|----------------|--|
| 6 | Acceleration Due to Gravity |
| 7 | Non-Uniform Motion |
| 8 | Atwood's Pulley |
| 9 | Collision: Ramp |
| 10 | Moment of Inertia (<i>Lab instructions to be provided</i>) |

Note: *Lab reports are due at the end of the lab period, unless announced otherwise. 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 13, 2013. Last seminar will not be graded; however, solution will be posted.

Quizzes/Assignments[#]: Assignments will be done online using Mastering Engineering. Details on how to access Mastering Engineering will be provided. Assignments must be completed by the due date and time to receive credit. All assignments will be due by 19:00 on the due date. There will be 10 assignments each consisting of 5 problems. Only 9 of the 10 assignments will be used in the calculation of the total assignment mark.

You should come prepared for a quiz based on assigned problems in the class immediately following the due date. There will be 10 assignments for this class.

Laboratory: There are five 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.

Midterm Exam: The midterm will be 1½ - 2 hours long (exact duration TBD), and is a closed-book, closed-notes exam with a formulae sheet provided by the instructor. **There will be NO make-up midterm exam.** Students who miss the midterm exam due to a valid reason, such as illness, will have the weight transferred to the final exam. A supporting document such as doctor's note and a phone message or email will be required in such case.

Final Exam: The final exam will be approximately 3 hours long, cumulative, closed-book, closed-notes exam with the formulae sheet provided by the instructor. If the final is missed due to illness it will be deferred (see calendar for information). A doctor's note and a phone message or email will be required in such cases. *Your final grade will be available through the Registrar's office or on myGPRC portal.* Grades or marks cannot be disclosed by email or phone and all such requests will be disregarded.

GRADING CRITERIA:

| GRADING CONVERSION CHART – THIS IS A GENERAL GUIDELINE ONLY | | | |
|---|--------------------|-----------------------|-------------------------------------|
| 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 |

STUDENTS WITH DISABILITIES: Students who require accommodation in this course due to a disability are advised to discuss their needs with student services. Please ensure that the required forms for exams are submitted to the instructor at least four business days before the date of the midterm or by the last lecture class for the final exam.

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/

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class.