

UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE OUTLINE

1. **Course:** Physics 321, Harmonic Motion, Waves, and Rotation

Lecture Sections:

L01: MWF, 08:00-08:50, ENA 03

Tutorial: Th 14:00-15:50, ST 131

Dr. Jeroen M. Stil, Science B SB 519, 403-220-8015, jstil@ucalgary.ca, Office Hours: Monday 13:30 – 15:30

Course information: <http://d2l.ucalgary.ca>

Department of Physics and Astronomy, Science B SB605, 403-220-5385, office@phas.ucalgary.ca

2. **Prerequisites:** Physics 211 or 221 and Mathematics 211 or 213 and 253 or Applied Mathematics 219.
Antirequisites: Credit for Physics 321 and 227 will not be allowed.

3. **Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Assignments (8)	20%	Administered through TopHat Monocle
Midterm test	40%	Thursday, February 27, 14:00-15:50 Location: ST 131
Final Examination	40%	(To be scheduled by the Registrar)
Bonus credit	2%	Tutorial participation
	1%	Lecture participation

The course grade is calculated from the percentage grades of the separate course components with weights indicated above. A table for the conversion of percentage grades to letter grades is provided on page 3 of this course outline. **The percentage grades in this table are threshold values.** The percentage grade for the course must be **equal to or larger than** the stated value to obtain a certain letter grade.

A **passing grade for the final exam is required** in order to obtain a letter grade higher than D+ for this course. Students who do not score a passing grade on the final exam can only obtain a letter grade D+ or less for the course. **Exams are cumulative.** Use of books is not allowed on the exams. Use of a calculator is allowed and recommended. Exams can include multiple-choice questions and open-answer questions. Exam regulations as outlined in the university calendar are also applicable to the midterm exam.

Grading of exams will be based on **clarity and completeness of the method used to derive the answer, and correctness of the answer including correct units.** Illegible text will not be marked. Scratched-out sections of exam papers will not be marked.

Any **missed course component** will be assigned a **zero grade**, unless a valid reason as described in the University Calendar is presented with appropriate documentation (for example a doctor's note).

Homework. Eight assignments are due at 23:59 on Sundays as listed on page 4 of this document. Answers must be entered through TopHat Monocle before the set due date. **Last-minute technical problems are not a valid excuse for missing the due date of any assignment.**

In-class participation. We will use the TopHat Monocle system during class time and during tutorials for in-class questions that will only be open to submit answers during the lecture or tutorial in which they are presented. Bonus credit for tutorial participation will be calculated as follows (percentages mean as a fraction of total number of questions during the period that participation for bonus credit is recorded): **Tutorial participation:** Less than 30% participation: no bonus credit. From 30% to 75% participation: 1%. More than 75% participation: 2% bonus credit. **Lecture participation:** More than 50% participation: 1% bonus credit, 0% otherwise. The in-class participation credit does not depend on the submitted answers. **Participation credit will commence on January 20.** In-class questions before this date are considered practice rounds and will not be counted towards participation.

Grading of in-class participation credit is exclusively based on information provided by TopHat Monocle. Concerns regarding completeness of submitted answers or technical problems must be resolved through TopHat support (<http://support.tophatmonocle.com>).

Students are responsible for accuracy and completeness of their personal information in the TopHat system. Failure to provide accurate and complete information may result in delay of grading, or even a zero mark for every affected course component.

Students unable to participate with TopHat Monocle in class and during the tutorials can apply to the instructor to apply 3% bonus credit to the final exam grade. This application must be done on or before **Monday, March 3, 2014**.

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.6](#) of the University Calendar

5. **Scheduled out-of-class activities:** There are no scheduled out-of-class activities for this course.

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. **Course Materials:** *"Physics for Scientists and Engineers – a Strategic Approach", 3^d Edition, Volume 1, by Randall A. Knight, Pearson*

Online Course Components: Students are required to register for use of TopHat Monocle through the website <http://ca.tophatmonocle.com>. Use of the TopHat system is free of charge for all students enrolled in the course. We will use TopHat for on-line assignments and for interactive work during the lectures and the tutorials. A small bonus credit is awarded for students participating in the lectures and the tutorials (see section 3, Grading).

7. **Examination Policy:** Exams are closed-book. Use of books is not allowed on the exams. Use of a calculator is allowed and recommended. Use of electronic devices with a camera, mass storage, or wireless communication is not allowed on exams, except when determined a necessity for students that qualify under section 11(c) below. Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory and Optional Course Supplemental Fees:** There are no mandatory or optional supplemental fees.

9. **Writing across the curriculum statement:** Exams will be graded based on clarity and completeness of answers provided. Otherwise, there is no assessment of student's writing in this course. See also [Section E.2](#) of the University Calendar.

10. **Human studies statement:** Students will not be asked to participate in or be subjects of any human studies. See also [Section E.5](#) of the University Calendar.

11. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

(a) **Academic Misconduct:** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#), Student Misconduct to inform yourself of definitions, processes and penalties

(b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

(c) **Academic Accommodation Policy:** Students with documentable disabilities are referred to the following links: [Calendar entry on students with disabilities](#) and [Student Accessibility Services](#).

(d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

(e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.

(f) **Student Union Information:** [VP Academic](#) Phone: 220-3911 Email: suvpaca@ucalgary.ca.

SU Faculty Rep. Phone: 220-3913 Email: sciencerep@su.ucalgary.ca
[Student Ombudsman](#)

(i) Internet and Electronic Device Information: You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

The following signature lines should be added to the course outline as appropriate

Department Approval _____ Date _____

Associate Dean's Approval for out of regular class-time activity: _____ Date: _____

Associate Dean's Approval for Alternate final examination arrangements: _____ Date: _____

Grading scheme

Your Course Letter Grade for ASTR 207 will be based on the weighted average percentages of the various course components (Test 1, Test 2, in-class participation, homework challenge questions, and final examination) using the weighting scheme on the first page of this course outline. The conversion from weighted average percentage to course letter grade is (minimum scores required to obtain a letter grade):

90%	A+	75%	B+	60%	C+	47%	D+
85%	A	70%	B	55%	C	45%	D
80%	A-	65%	B-	50%	C-	<45%	F

YOU MUST PASS THE FINAL EXAM TO GET A LETTER GRADE HIGHER THAN D+ FOR THE COURSE

Course Syllabus

At the end of the term, students are expected to apply with confidence the physics of rotation, waves, and a simple harmonic oscillator in a wide variety of applications. We will cover the subjects outlined in the schedule on the next page. Problems on the exams will cover sections in the outline below, plus assignments plus tutorials plus course notes. For example, 12.1 means Chapter 12, Section 1 of the text book. The subject of waves is covered by course notes only.

Week	Dates	Topics	Reading
1	January 8 – 10, 2014 No tutorial this week	Introduction to course Rotational motion	Course Outline 12.1
2	January 13 – 17, 2014	Rotation about the centre of mass Rotational energy Assignment 1 Due 23:59 on January 19	12.2 12.3
3	January 20 – 24, 2014	Calculating moment of inertia Torque Assignment 2 Due 23:59 on January 26	12.4 12.5
4	January 27 – 31, 2014	Rotational dynamics Rotation about a fixed axis Static equilibrium Assignment 3 Due 23:59 on February 2	12.6 12.7 12.8
5	February 3 – 7, 2014	Rolling motion Right hand rule for vectors Angular momentum Assignment 4 Due 23:59 on February 9	12.9 12.10 12.11
6	February 10 – 14, 2014	Angular momentum (continued) Simple harmonic motion Simple harmonic motion and circular motion	12.11 14.1 14.2
7	February 17 – 21, 2014	Reading Week. No Lectures or Tutorials	
8	February 24 – 28, 2014	Energy in simple harmonic motion The dynamics of simple harmonic motion Vertical oscillations MIDTERM EXAM Thursday, February 27 Assignment 5 Due 23:59 on February 23	14.3 14.4 14.5
9	March 3 – 7, 2014	The pendulum Summary on damped oscillations Driven oscillations and resonance Assignment 6 Due 23:59 on March 2	14.6 14.7 (partial) 14.8
10	March 10 – 14, 2014	Waves	Lecture notes
11	March 17 – 21, 2014	Waves Fluids Pressure Assignment 7 Due 23:59 on March 9	Lecture notes 15.1 15.2
12	March 24 – 28, 2014	Measuring and using pressure Buoyancy	15.3 15.4
13	March 31 – April 4, 2014	Fluid dynamics Elasticity Assignment 8 Due 23:59 on April	15.5 15.6
14	April 7 – April 11, 2014	Elasticity (continued)	15.6