



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE OUTLINE

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

Lecture Sections:

L01: MWF, 08:00-08:50 in ST 131, Dr. Jeroen M. Stil, Science B SB 519, 403-220-8015, jstil@ucalgary.ca, Office Hours: Wednesday 13:30 – 15:30. Tutorial: Th 14:00-15:50 ENE 243

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

Departmental Office: SB 605, 403-220-5385, phasugrd@ucalgary.ca

2. **Prerequisites:** [Physics 211](#) or [221](#) and [Mathematics 211](#) or [213](#) and [Mathematics 267](#) or [277](#) or [253](#) or Applied Mathematics 217. 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% (See schedule on page 4 for due dates)
Midterm test	40% (Thursday, March 5 14:00-15:30 in ENE 243; 90 min. writing)
Final Examination	40% (To be scheduled by the Registrar)

The course grade expressed as a percentage is calculated from the percentage grades of the separate course components with weights indicated above. A table for the conversion of percentage grades for the course to letter grades is provided below. The percentage grade for the course must be **equal to or larger than** the stated value to obtain a certain letter grade, without rounding.

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 obtain a passing grade for the final must expect a letter grade for the course no higher than D+, possibly less depending on the percentage grade for the 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).

Percentage to letter grade conversion scale:

> = 90.00 %	A +	> = 75.00 %	B +	> = 60.00 %	C +	> = 47.00 %	D +
> = 85.00 %	A	> = 70.00 %	B	> = 55.00 %	C	> = 45.00 %	D
> = 80.00 %	A -	> = 65.00 %	B -	> = 50.00 %	C -	< 45.00 %	F

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 Monday, January 26.** 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. Any individual that registers more than once for the same on-line course component is subject to the affected course work being rejected with a zero grade, and may be subject to a charge of academic misconduct.

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 by email to the instructor on or before **Monday, March 2, 2015**. The percentage grade for the final examination will then be inserted instead of the TopHat participation percentage in the calculation of the bonus credit.

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", 3rd Edition, Volume 1, by Randall A. Knight, Pearson*

The text book has no chapter about waves. Readings on waves will be provided to enrolled students in the PHYS 321 D2L area.

Online Course Components: TopHat Monocle <http://ca.tophatmonocle.com> is used in this course in two different ways: in-class participation and homework assignments. Students can apply for an alternative to the in-class participation component as explained in item 3 of this course outline. However, every student in the course is expected to register with TopHat Monocle for completion of the homework assignments.

7. Examination Policy: Exams are cumulative. 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. Calculator software on mobile phones or similar devices, and "smart watches" are not allowed on the exams. Use of a ruler is allowed, and may be recommended for exams that include problems with graphs. 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) Misconduct: 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: Students with Disabilities: <http://www.ucalgary.ca/pubs/calendar/current/b-1.html> [B.1](#) and Student Accessibility Services: <http://www.ucalgary.ca/access/>.

- (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 (FOIPP). 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](#)
- (g) **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.
- (h) **U.S.R.I.:** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

Signatures:

Department Approval _____ Date _____

Appendix: The following table gives an approximate week-by-week break-down of the course schedule

Week	Dates	Topics	Reading
1	January 12 – 16, 2015 No tutorial this week	Introduction to course Rotational motion	Course Outline 12.1
2	January 19 – 23, 2015	Rotation about the centre of mass Rotational energy Assignment 1 Due 23:59 on January 25	12.2 12.3
3	January 26 – 30, 2015	Calculating moment of inertia Torque Assignment 2 Due 23:59 on February 1	12.4 12.5
4	February 2 – 6, 2015	Rotational dynamics Rotation about a fixed axis Static equilibrium Assignment 3 Due 23:59 on February 8	12.6 12.7 12.8
5	February 9 – 13, 2015	Rolling motion Right hand rule for vectors Angular momentum	12.9 12.10 12.11
6	February 16 – 20, 2015	Reading Week. No Lectures or Tutorials Assignment 4 Due 23:59 on February 22	
7	February 23 – 27, 2015	Angular momentum (continued) Simple harmonic motion Simple harmonic motion and circular motion Assignment 5 Due 23:59 on March 1	12.11 14.1 14.2
8	March 2 – 6, 2015	Energy in simple harmonic motion The dynamics of simple harmonic motion Vertical oscillations MIDTERM EXAM Thursday, March 5 14:00-15:30 in ENE 243	14.3 14.4 14.5
9	March 9 – 13, 2015	The pendulum Summary on damped oscillations Driven oscillations and resonance Assignment 6 Due 23:59 on March 15	14.6 14.7 (partial) 14.8
10	March 16 – 20, 2015	Waves	Lecture notes
11	March 23 – 27, 2015	Waves Fluids Pressure Assignment 7 Due 23:59 on March 22	Lecture notes 15.1 15.2
12	March 30 – April 3, 2015	Measuring and using pressure Buoyancy No lecture April 3, University closed.	15.3 15.4
13	April 6 – April 10, 2015	Fluid dynamics Elasticity Assignment 8 Due 23:59 on April 12	15.5 15.6
14	April 13 – April 15, 2015	Elasticity (continued)	15.6