

Physics 523 Fall 2017 Syllabus

Prof. Jay Hubisz

Course Objectives

In this course, you will be learning about advanced methods in classical mechanics. While it is in principle true that you can solve any classical system through brute force application of Newton's 3 laws, this is intractable or at least overly tedious for a wide range of interesting and relevant mechanical systems which yield only with more advanced techniques.

In this course, we will:

- Review/strengthen/generalize the concepts of force, coordinates, trajectories, rotational motion and energy
- Review theory of oscillations
- Introduce concepts associated with the calculus of variations
- Lagrangian Mechanics
- Central Force Motion
- Mechanics in non-inertial frames
- Rigid body rotation
- Coupled systems
- Hamiltonian mechanics
- Additional Special Topics (Chaos? Classical field theory? Fluid dynamics?)

Course Webpage/Blog

I will maintain a repositories of homeworks/solutions/mathematica notebooks etc at the following location: <https://jhubisz.expressions.syr.edu/phy523-f17/>

Main Textbook

“Classical Mechanics” By John R. Taylor

<http://www.amazon.com/Classical-Mechanics-John-R-Taylor/dp/189138922X/>

ISBN-10: 189138922X

ISBN-13: 978-1891389221

Other Recommended Textbooks

1. Fowles & Cassiday - “Analytical Mechanics” (a similar level to what we are doing, but less verbose in wording)
2. Marion & Thornton - “Classical Dynamics of Particles and Systems” (a similar level to what we are doing, but less verbose in wording)
3. Landau & Lifshitz - “Mechanics” - more advanced, and extremely terse, but done by the masters in classic Russian style - a great source of problems to work out
4. Goldstein: “Classical Mechanics” (a more advanced treatment - generally a graduate level course)

Instructor

Prof. Jay Hubisz

Physics Building 311

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315-443-2653

Office Hours: Thursdays 2pm - 3pm or by appointment

Lectures

Lectures are held twice a week, Tuesdays and Thursdays from 11:00am to 12:20pm, in Physics Building Rm 104N.

Reading Assignments

Reading assignments will be posted weekly, on the course webpage, before the material is covered in lecture. You are strongly encouraged to do the reading in advance, since the lectures will not contain a complete presentation of all material but instead emphasize important (and possibly difficult) points.

Homeworks

Your focus throughout the semester should be on the homework. Understanding the homework problems are the best way to ensure high performance on the exams. Homework will be made available on Tuesdays in lecture, and on the course website as well. They will be due one week later, to be turned in to the professor. Homework will account for 30% of the final grade. Your two lowest homework scores will be dropped.

Midterm Exam

A mid-term exam will be given at the lecture hours on Tuesday October 17th. The midterm will account for 30% of your final grade.

Final Exam

Comprehensive Final Exam is scheduled for Tuesday December 14th, from 3-5pm, in Physics Building Room B126. The exam will be open book. The final exam will account for 40% of your total grade.

Exam Illness Policy

Students will be allowed to make up for exams they miss due to illness. Students must present a note from the student health center, dated either previous to or the day of the exam being offered. The note must state that the student was ill at the time of the exam being offered. The makeup exam must be scheduled with Prof. Hubisz, and will be 7-10 days after the original date of the exam missed.

Grading

Homework:	30%
Midterm:	30%
Final Exam:	40%

The following grading scale will be used:

Your score (%)	Letter grade
94-100	A
90-93	A-
87-89	B+
84-86	B
80-83	B-
75-79	C+
70-74	C
60-69	C-
50-59	D
0-49	F

Grades are rounded to the nearest integer (e.g. 80.3 \rightarrow 80, 80.8 \rightarrow 81, 80.50 \rightarrow 81, so an 89.8 qualifies as an A-, while an 89.49 is a B+).

Absence Policy

In general late homework will not be accepted. Exams can be made up, but only in the case of illness or emergency with a note from Student Assistance: 315-443-4357. Do not become late on homework assignments early in the semester or your losses will compound! Save the drop policy for real emergencies which may come later. No accommodations will be made if you get sick, but skipped earlier classes or assignments without excuse from student assistance. Contact Prof. Hubisz immediately if you get sick or are unable to participate for extended periods of time. The final exam cannot be missed, and you must take it to pass the course.

Academic Integrity

The statement endorsed by Syracuse University reads:

Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and

Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice.

The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level.

I will further add the following:

In an institution of higher learning I expect students to develop both personally and professionally. Part of this involves developing a code of honor and responsibility regarding your intellectual pursuits and endeavors. Your goal should be personal development and enrichment, with numerical scores merely a by-product of the extent to which you achieve this goal, not the aim itself. I ask you to conduct yourselves in a manner befitting this goal, which tangentially prohibits any conduct in violation of scholastic integrity rules, and further requires that you continually examine your methods and ethics to maximize your personal and professional growth as scientists.

Students with Disabilities

If you believe that you need academic adjustments (accommodations) for a disability, please contact the Office of Disability Services (ODS), located in Room 309 of 804 University Avenue, visit the ODS website <http://disabilityservices.syr.edu>, or call (315) 443-4498 or TDD: (315) 443-1371 for an appointment to discuss your needs and the process for requesting academic adjustments. ODS is responsible for coordinating disability-related academic adjustments and will issue students with documented Disabilities Accommodation Authorization Letters, as appropriate. Since academic adjustments may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

Religion Observance Policies

SU religious observances notification and policy, found at <http://hendricks.syr.edu/spiritual-life/index.html>, recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes and by the submission deadline for flexibly formatted classes. For fall and spring semesters, an online notification process is available for students in My Slice / StudentServices / Enrollment / MyReligiousObservances / Add a Notification. Instructors

may access a list of their students who have submitted a notification in My Slice Faculty Center.