

PHYS 6321: Classical Mechanics Syllabus

Professor Allison Deiana
Spring 2021

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1 Course Information

Where?	FOSC 158
When?	Monday, Wednesday, Friday: 3:00 – 3:50 PM
Instructor	Professor Allison Deiana Office: 32A Fondren Science Phone: (214)-768-1476 Email: adeiana@smu.edu Twitter/Instagram: DeianaDr
Office Hours	Where: 045 Fondren Science Building When: By appointment, please contact me via email.
Course Website	https://smu.instructure.com/courses/106041
Course Textbook	Classical Mechanics. (2nd or 3rd Edition) by Herbert Goldstein
Optional References	Classical Mechanics with Applications, by Porter Wear Johnson Mechanics, by Keith R. Symon Classical Dynamics of Particles and Systems. by Thornton and Marion Schaum's Outline of Mathematical Handbook of Formulas and Tables

Class will consist primarily of lecture and example problems to demonstrate the derived principles. As frequently as is feasible, students will be encouraged to work problems on the board together. This will be useful as a means of active participation in the learning process, and to clarify ideas through instructor feedback and support.

Students are expected to attend class regularly, to participate in class example problems and discussion of concepts, to complete homework assignments on time, and to prepare for in-class tests. It is also expected that the students will read and study the Goldstein material that is covered in each lecture period, and will contact the instructor to arrange office hours for going over additional questions.

2 Course Objectives

As described in the SMU Graduate Course Catalog:

“Topics in classical mechanics, including the mechanics of a system of particles, the two-body central-force problem, Lagrange’s and Hamilton’s formulations, the special theory of relativity, Hamilton-Jacobi theory, and continuous systems and fields.”

The objective of the course is that students will be able to apply their knowledge of Classical Mechanics in solving graduate-level physics problems.

3 Tests, Assignments and Grading

Your course grade will be based on homework (40%), two tests (40% total), and a final exam (20%). Questions concerning grading of returned assignments will be accepted by the instructor via email **only** within 7 days of the posting of grades. While attendance does not impact your grade, attendance in class is strongly encouraged for understanding the material and performing well on tests/homework. Make-up tests, if a test is missed due to an excusable reason (e.g. health, university-excused absences), will be allowed. Please contact the instructor as soon as you are aware that this will happen, if this is the case.

The grading scale used in this course is standard and that recommended for courses at SMU. For the ranges, a “[“ or “]” indicates the adjacent number is included in the range, while a “(“ or “)” indicates the adjacent number is excluded from the range.

Grade	Range	Interpretation
A	[94,100]	Excellent Scholarship
A-	[90,94)	Excellent Scholarship
B+	[87,90)	Good Scholarship
B	[84,87)	Good Scholarship
B-	[80,84)	Good Scholarship
C+	[77,80)	Fair Scholarship
C	[74,77)	Fair Scholarship
C-	[70,74)	Fair Scholarship
D+	[67,70)	Poor Scholarship
D	[64,67)	Poor Scholarship
D-	[61,64)	Poor Scholarship
F	[0,61)	Fail

3.1 Class Preparation

Reading will be assigned from the textbook for each class period, as a resource to you for class preparation. This will be announced on the course Canvas page. You will get the most out of lecture periods if you have taken some time to familiarize yourself with the material in advance.

3.2 Homework

- Homework will generally be assigned on Wednesday and will be due the following Wednesday, though I will not assign homework on test weeks. Thus, homework is expected to be due on Jan. 25, Feb. 1, Feb. 8, Feb. 15, March 1, March 8, March 22, March 29, April 12, and April 19, April 26.
- Homework will be assigned on Canvas, to be turned in during class on the deadline.
- It is permitted to work in study groups for homework, provided that individual work is turned in.
- If you are not able to turn your homework in on time, the maximum score you can receive for the homework diminishes by 10% for each late day (e.g. 1 day late = maximum score of 90%).
- If you are unable to turn your homework in on Wednesday in class, and are unable to locate me when you do turn it in, please just scan it and email it to me. That way it will have a date stamp for grading purposes. It will count as turned-in at the time you successfully sent the email.

3.3 Exams

There will be two exams (Exam 1: Wednesday, Feb. 22nd, Exam 2: Wednesday, April 5th,) and a cumulative final exam (Tuesday May 4, 3-6 PM).

4 Homework and Other Written Materials Policy

This policy applies to homework, tests, or any other written material that you submit for grading. The following information must **always** be at the **top of the front page**.

- Your full **name**.
- The **name of the assignment** (e.g. Homework 1)
- The **date** you have turned it in.

For full credit, your work must also satisfy the following criteria:

- Each question is **titled** (e.g. Problem 1).
- Writing/image quality must be **legible**.
- **Work done** in obtaining the solution must be included. It must be possible to follow the logic of your solution.
- Final answers must be **boxed** and have **correct units**.

5 University Honor Code

The student code of conduct can be found in the 2018 - 2019 Student Handbook which is available on the SMU website (<http://smu.edu/catalogs/>). All students will be expected to adhere to it. Any student found cheating or plagiarizing another's work will be given a zero for that assignment and a complaint will be filed through the Vice President for Student Affairs Office.

6 Disabilities Accomodation

Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit <http://www.smu.edu/Provost/SASP/DASS> to begin the process. Once approved and registered, students will submit a DASS Accommodation letter to faculty through the electronic portal DASS Link and then communicate directly with each instructor to make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

7 Policies Regarding Planned Absences

7.1 Religious Observance

Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (<https://www.smu.edu/StudentAffairs/ChaplainandReligiousLife/ReligiousHolidays>).

7.2 Excused Absences for University Extracurricular Activities

Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (See 2020-2021 SMU Undergraduate Catalog under "Enrollment and Academic Records/Enrollment Policies/Excused Absences.")

7.3 Pregnant or Parenting Students

Accommodations for pregnant and parenting students: Under Title IX students who are pregnant or parenting may request academic adjustments by contacting Elsie Johnson

(elsiej@smu.edu) in the Office of the Dean of Students, or by calling 214-768-4564. Students seeking assistance must schedule an appointment with their professors as early as possible, present a letter from the Office of the Dean of Students, and make appropriate arrangements. Please note that academic adjustments are not retroactive and, when feasible, require advance notice to implement.

7.4 Covid-19

Students who are experiencing COVID-19 symptoms or who have been notified through contact tracing of potential exposure and need to self-quarantine or isolate must follow the protocols laid out in SMU's Contact Tracing Protocol. To ensure academic continuity, students in these situations will not be penalized and will be provided appropriate modifications to assignments, deadlines, and testing. Please also note that SMUFlex classes might, in rare circumstances, go remote for two week periods to accommodate COVID-related issues. To ensure these necessary accommodations, affected students must:

- Provide as much advance notification as possible to the instructor about a change in circumstances. Students must notify their instructor about a potential absence as well as plans for a return to class. For cases in which students test positive for COVID-19, they should fill out a CCC form at [this link](#)
- Communicate promptly with the instructor to establish, as necessary, alternative assignments and/or changes to deadlines and exams. Students are then responsible for meeting the expectations laid out in these alternative arrangements.
- Continue participation in class via Zoom, as health circumstances permit. Attend class regularly, when not in a situation outlined above, in accordance with safety measures laid out by SMU CAN in the Pledge to Protect (including wearing masks, maintaining social distancing, and cleaning personal space after class). In-person participation in SMUFlex classes is required on students' assigned red/blue rotation days except in cases when students are experiencing illness, are in self-quarantine or in isolation.
- Students facing multiple or extended COVID-19-related absences or illness can work with the Office of the Dean of Students to consider options such as fully remote learning or medical withdrawal.

This policy, aligned with the SMU Honor Code and the SMU Pledge to Protect relies on mutual trust and respect between students and faculty to ensure safety, academic integrity, and instructional continuity.

8 Sexual Harassment

All forms of sexual harassment including sexual assault, dating violence, domestic violence and stalking are violations of SMU's Title IX Sexual Harassment Policy and may also violate Texas law. Students who wish to file a complaint or receive more information about the grievance process may contact Samantha Thomas, SMU's Title IX Coordinator, at accessequity@smu.edu or 214-768-3601. Please note that faculty are mandatory reporters. If students notify faculty of sexual harassment, they must report it to the Title IX Coordinator. For more information about sexual harassment including resources available to assist students, please visit www.smu.edu/sexualmisconduct.

9 Course Schedule Overview

The material expected to be covered on a week-by-week basis is as follows:

- Week 1: Goldstein, 2nd Edition, Chapter 1.1-1.4: Survey of Elementary Principles
- Week 2: Goldstein, 2nd Edition, Chapter 1.5-2.4: Lagrange's Equations and Calculus of Variations
- Week 3: Goldstein, 2nd Edition, Chapter 2.4-3.6: Two-body Problems
- Week 4: Test 1, Goldstein, 2nd Edition, Chapter 3.7-3.11
- Week 5: Goldstein, 2nd Edition, Chapter 4.1-4.4: Rigid Body Motion
- Week 6: Goldstein, 2nd Edition, Chapter 4.4-5.6
- Week 7: Goldstein, 2nd Edition, Chapter 5.7-6.4: Small Oscillations
- Week 8: Test 2, 6.4-6.5, beginning Special Relativity (not from Goldstein)
- Week 9: Special Relativity (not from Goldstein), Goldstein, 2nd Edition, Chapter 8.1-8.3
- Week 10: Goldstein, 2nd Edition, Chapter 8.3-9.4: Hamilton equations of motion
- Week 11: Goldstein, 2nd Edition, Chapter 9.4-10.2: Canonical Transformations
- Week 12: Test 3, Goldstein, 2nd Edition, Chapter 10.2-10.5: Hamilton-Jacobi Theory
- Week 13: Goldstein, 2nd Edition, Chapter 10.6-11.2
- Thursday, May 4: Final Exam

The designated “weeks” of class begin on the week of January 16th (we do not meet on Monday for this first week), and continue to the final “week” of April 24th plus the following Monday (May 1st). Some slippage of this schedule may occur, given the usual uncertainties on the speed of covering material in a given class. I do not consider spring break a class week (since we have no class), so it is not numbered.

10 Important Dates

Please see this page ([link in pdf](#)) for the full academic calendar.