

# Syllabus: PHYS5153 Classical Mechanics (Fall 2021)

August 21, 2021

## Important details

- **Instructor:** Dr. Robert Lewis-Swan (Office: Lin Hall 245, Email: lewisswan@ou.edu)
- **Lectures:** 1:30-2:45pm, Monday and Wednesday, Nielsen Hall 203
- **Office hours:** Mondays 3:00pm-4:00pm in-person or via Zoom. You can also contact me by email and drop by my office (outside scheduled office hours I cannot guarantee I will be available).
- **Course website:** canvas.ou.edu
- **Textbook:** Classical Mechanics (3rd Ed.) by Goldstein, Poole and Safko, ISBN 978-0201657029

## Course prerequisites

PHYS3053 (Physical Mechanics II) or equivalent.

## Subject matter and concepts

Hamilton's principle, Lagrange's equations, mechanics of particles and rigid bodies, Hamilton's equations, canonical transformations, Poisson brackets, classical chaos.

## Assessment

There will be a total of 11 homework assignments, *with your 9 best marks counting towards your final grade*. These are typically due each Wednesday of the semester, and should be handed to myself or submitted digitally via Canvas. Assignments will be posted on Canvas, typical on the Thursday preceding the due date. **Late submissions will not be accepted (i.e., *you will receive zero marks*) unless you provide me with a documented medical reason or other emergency.** Solutions should be presented *legibly* (handwritten or LaTeX is equally acceptable) so that the grader can follow your line of thinking and any mathematical working should be appropriately explained/described. If you provide only equations you will be marked zero. If you provide equations that are completely wrong but can demonstrate some accompanying logical reasoning then you increase your chances of receiving more than zero. If any of your solution has relied on a reference or material other than the textbook or lectures, please note this and provide details.

There will three exams (two midsemester exams and one final exam).

- Midsemester 1 (1.5 hrs): Tentatively scheduled for 1:30pm-3:00pm Wednesday Sept. 29, 2021. Location: Nielsen Hall 203.
- Midsemester 2 (1.5 hrs): Tentatively scheduled for 1:30pm-3:00pm Wednesday Nov. 3, 2021. Location: Nielsen Hall 203.
- Final (3 hrs): Tentatively scheduled for 8:00am-11:00am Friday Dec 17, 2021. Location: Nielsen Hall 203.

The midsemester exams will focus on material from the first and second portions of the course, respectively. Material from the entire course may be covered in the final exam. There will be no assignment *due* in the week of each exam so that you can focus on revision. If we need to make any changes to these details (e.g., scheduling or location of exams due to conflicts) I will notify you immediately and communicate the changes on Canvas.

Your marks from the exams and homework assignments will be combined for your final grade: Homework assignments (best 9 out of 11) 40%, Midsemester 1 15%, Midsemester 2 15%, Final Exam 30%. Your final mark will be given as a letter grade (A, B, ...) as stipulated by the University, and the course will *not* be curved (i.e., all students assessment is graded on an identical linear scale). However, I do not set prescriptive cutoffs for each letter grade at the beginning of the course. As a guide:

- Grade of A: indicates that you have demonstrated strong competency of the graduate material covered in the class.
- Grade of B: indicates that you have demonstrated essential competency of the graduate material covered in the class.
- Grade of C: indicates that you have demonstrated rudimentary competency of the graduate material covered in the class.

## Additional resources

- Mechanics (Course of Theoretical Physics Vol. 1, 3rd Ed.) by Landau and Lifshitz, ISBN 978-0750628969
- An introduction to mechanics (2nd Ed.), Kleppner and Kolenkow, ISBN 978-0521198110

## Policies and notices

- **Academic integrity:** Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Students Guide to Academic Integrity at <http://integrity.ou.edu/students/guide.html>. To be successful in this class, all work on exams must be yours and yours alone (see above for comments on HW). You may not receive outside help. On exams you are not permitted to use your notes, textbooks, calculators, or any other study aids. Should you see someone else engaging in this behavior, I encourage you to report it to myself or directly to the Office of Academic Integrity Programs. That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to report academic misconduct, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and an F in this course, so do not cheat. It is simply not worth it.
- **Religious observance:** It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty. Please inform the instructor far in advance of any time conflicts.
- **Reasonable accommodation policy:** Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website <http://www.ou.edu/drc/home.html>. Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.
- **Title IX resources and reporting requirement:** For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, the University offers

a variety of resources. To learn more or to report an incident, please contact the Sexual Misconduct Office at 405/325-2215 (8 to 5, M-F) or [smo@ou.edu](mailto:smo@ou.edu). Incidents can also be reported confidentially to OU Advocates at 405/615-0013 (phones are answered 24 hours a day, 7 days a week). Also, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. Inquiries regarding non-discrimination policies may be directed to: Bobby J. Mason, University Equal Opportunity Officer and Title IX Coordinator at 405/325-3546 or [bjm@ou.edu](mailto:bjm@ou.edu). For more information, visit <http://www.ou.edu/eoo.html>.

- **Adjustments for Pregnancy/Childbirth Related Issues:** Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Disability Resource Center at 405/325-3852 as soon as possible. Also, see <http://www.ou.edu/eoo/faqs/pregnancy-faqs.html> for answers to commonly asked questions.
- **Attendance due to COVID-19:** A temporary university policy has been established to protect the OU community by ensuring that students who are ill or required to isolate feel encouraged to remain at home. Missing a class session or other class activity due to illness or isolation will not result in a penalty for the absence, and the student will not be asked to provide formal documentation from a healthcare provider to excuse the absence. This policy is based on all students and faculty adhering to the principles of integrity, honesty, and concern for others. Students who are experiencing symptoms of COVID-19, including cough, fever, shortness of breath, muscle pain, headache, chills, sore throat, loss of taste or smell, congestion or runny nose, nausea or vomiting, or diarrhea or who have been in close contact with others who have symptoms should:
  - Remain at home to protect others
  - Ensure that any needed screening has been conducted (COVID-19 Screening and Reporting Tool - <https://covidreporting.ouhsc.edu>) and any needed treatment obtained
  - Contact the instructor prior to absence or inability to participate, if possible, and provide an honest report of the reason for which you cannot attend class or complete a course activity
  - Continue to complete coursework to the extent possible, using Canvas, zoom, and other online tools
  - Submit assignments electronically to the extent possible and as directed by the instructor
  - Communicate with the instructor to arrange modifications to deadlines or work requirements or reschedule exams or other important course activities, when it is necessary