Physics 341 - Classical Physics I: Particle Mechanics - Fall 19

Instructor
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phone: 474-6108
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Open Office hours
Walk-ins are very welcome; appointments help; email is effective for straight-forward questions.

Course Info
Phys341, 4 credits

Prerequisites
Phys220, 301; or permission of instructor.

Lectures
MWF 2:15 to 3:15 am, T 1:15-2:15, NSCI 207.

Noyes Lab
Access to the Noyes Computer Lab (Rm 101 NSCI) is provided to all students enrolled in a Physics course. Your polar express card lets you in.

Text

Required text:

Supplementary readings:
Classical dynamics of particles and systems, by Marion, Thornton, Brooks/Cole (1995) - many examples and pictures
Mechanics by K.R. Symon, Prentice Hall (3rd edition, 2001) - that's the book we have used before in phys311/312
Introduction to Classical Mechanics, by A. Ayra, Prentice Hall (1998) - not as complete as symon, but more examples
Classical Mechanics, by H. Goldstein, Addison-Wesley (2002) - for advanced reading, usually at graduate level

There are many books on introductory classical mechanics in the library that almost all cover the material presented in the lectures. Please explore them to see different approaches to our topics.

Course Content

Tentative course calendar
Newtonian mechanics, conserved mechanical quantities, motion of systems of particles, rigid body statics and dynamics, moving and accelerated coordinate systems, rigid body rotations, and Lagrangian mechanics.

Course Goals
This course provides an introduction into the theoretical principles of classical mechanics. First we explore particle dynamics based on Newton's laws of motion. Then we discuss particle dynamics in terms of the Lagrangian concept, which is based on energy concepts.

Student Learning Outcomes
Students learn,
--how to describe and solve problems in theoretical classical mechanics
--how to describe particle dynamics with Newton's and Lagrangian concepts
--to critically compare Newton's concept and Lagrange's concept for certain physical proble

Homework

Homework (10 assignments, each counting 100pts) will be assigned weekly and will be due at the beginning of class, unless explicitly altered at the time of assignment. Late homework will not be accepted. Relevant homework solutions will be posted in the glass case in the Physics Department hallway. I HIGHLY appreciate it if you RECYCLE paper for your homework! You can earn 100 bonus points in the homework by giving a 10min presentation to class on a topic related to class, for example the life of a classical physicist, an application of classical mechanics, experiments on classical mechanics, etc.
in case of issues with the homework link use: ffden-2.phys.uaf.edu/wacker/CLASS/341.html

Examinations
Two one-hour in-term examinations and a two hour final examination will be held during the semester. In-term exams will be held in the classroom. Upon request, an additional review class may be scheduled before each exam. The exams will be closed books and closed notes. No calculators, computers, or communication devices are allowed.

<table>
<thead>
<tr>
<th>Examination</th>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Instructor Notes</th>
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<tbody>
<tr>
<td>Exam 1 (in class)</td>
<td>Friday, Oct 4</td>
<td></td>
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<td>Taylor: approx. chapt. 1-5</td>
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<tr>
<td>Exam 2 (in class)</td>
<td>Friday, Nov 8</td>
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<td>Taylor: approx. chapt. 6-8, 13</td>
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<tr>
<td>Final Exam</td>
<td>Wednesday, Dec 11, 1-3pm</td>
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<td>Taylor: approx. chapt. 1-10, 13, 14</td>
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Grading
The maximum score for each homework will be 100 points. A solution (homework, exam) that presents nothing more than a restatement of the problem will receive zero credit. *Ineligible work will not be graded.* To pass the course with a grade higher than an "F", you need 40% of the total credits. Grades A to D are assigned equal weight for total credits between 40% and 100%. So, A+ (>97.5), A (>87.5), A- (>85), B+ (>82.5), B (>72.5), B- (>70), C+ (>67.5), C (>57.5), C- (>55), D+ (>52.5), D (>42.5), D- (>40). If this class is in your major you need at least a grade C- for passing the course and fulfilling prerequisites. For the final grade, homework, exams, etc. will be weighted as follows:

<table>
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<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
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<tr>
<td>Exam 1</td>
<td>25%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>25%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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Course Policies
Attendance at lectures is expected. Active class participation, questions are extremely welcome in the lectures. A missed exam will receive 0 credit unless the instructor is notified by email, phone, etc before the exam starts. Make-up exams will
be individually scheduled with the student.

<table>
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<tr>
<th>Student Obligations</th>
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<tr>
<td>As students of UAF, you are bound by the policies and regulations of the University of Alaska, UAF rules and procedures, and the Student Honor Code. You are obligated to make yourselves familiar with all conditions presented in the UAF Catalog. <em>Plagiarism on homework or on an exam will result in a failing grade.</em></td>
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<tr>
<th>Student Protection and Services Statement</th>
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<tr>
<td>Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: <a href="http://www.uaf.edu/handbook/">www.uaf.edu/handbook/</a>.</td>
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<tr>
<td>UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: <a href="https://alaska.edu/nondiscrimination/">https://alaska.edu/nondiscrimination/</a>.</td>
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<tr>
<td>Your instructor follows the University of Alaska Fairbanks Incomplete Grade Policy: “The letter “I” (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of work in a course but for personal reasons beyond the student’s control, such as sickness, has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an “I” grade.”</td>
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<td>Effective communication: Students who have difficulties with oral presentations and/or writing are strongly encouraged to get help from the UAF Department of Communication's Speaking Center (907-474-5470, <a href="mailto:speak@uaf.edu">speak@uaf.edu</a>) and the UAF English Department's Writing Center (907-474-5314, Gruening 8th floor), and/or CTC's Learning Center (604 Barnette Street, 907-455- 2860).</td>
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