

**Dynamics**  
 Phys-UA 120  
 Spring 2020  
 Monday, Wednesday 12:30 – 1:45  
 Room 1045, 726 Broadway

Professor: Frank A. Moscatelli, Rm 838, 726 Broadway

Office Hours: Tu, Th, 2 – 3 PM or by appointment.

Text: **Classical Mechanics** by John R. Taylor, University Science Books

Recitation: Wednesday 2:00 – 3:15 and 3:30 - 4:45 Rm 1067 in 726 Broadway

Recitation instructor: Aditya Hardikar

**Tentative Syllabus with Calendar**

**Monday**

**Wednesday**

Jan.27: Polar coordinates	Ch.1	Jan. 29: Lagrangian introduction	Ch.6
Feb. 3: Generalized Coordinates	Ch. 6	Feb.5: Calculus of variations	Ch. 6
Feb. 10: Lagrange's equations	Ch. 6	Feb. 12: Lagrange's equations	Ch. 7
Feb.17: Holiday (day off)	Ch. 7	Feb. 19: Constraints	Ch. 7
Feb. 24: Central force motion	Ch. 8	Feb. 26: Central force motion	Ch. 8
Mar. 2: Central force motion	Ch. 8	Mar. 4: Test 1	
Mar. 9: Non-inertial frames	Ch. 9	Mar.11: Non-inertial frames	Ch. 9
Mar.16: Spring Break	Ch. 9	Mar.18: Spring Break	Ch. 10
Mar. 23: Rigid body	Ch. 10	Mar. 25: Rigid body rotation	Ch. 10
Mar. 30: Rigid body rotation	Ch. 10	Apr. 1: Test 2	
Apr. 6: Hamiltonian Mechanics	Ch. 13	Apr. 8: Hamiltonian Mechanics	Ch. 13
Apr. 13: Hamiltonian Mechanics	Ch. 13	Apr. 15: Hamilton Jacobi theory	Notes
Apr. 20: Hamilton Jacobi theory	Notes	Apr. 22: Test 3	
Apr. 27: Collision theory	Ch. 14	Apr. 29: Collision theory	Ch.14
May 4: Buffer		May 6: Review	
May 11: Review			
May. 15: <b>Final 12:00 Noon – 1:50</b>			

## CLASS ORGANIZATION

The lectures serve as an introduction, but the real work of learning starts in recitation and when you do the homework. Lecture is most useful to you if you ask questions when there is something you do not understand. Do not imagine that you are the only person in the room who does not understand something. We are small enough to be quite informal.

A very important part of your physics education is the homework you do. Physics is a collaborative science; I encourage you to work together with one or more friends on the homework assignments. You learn by explaining things to each other. Of course, merely copying solutions is not only disallowed, but a violation of academic honesty codes.

The weekly homework assignments will be given out on Wednesday and will be collected the following Wednesday. The recitation instructor will review the homework problems handed in the previous week and may help you with difficulties you encounter in the assignment that is due.

Late homework assignments will not be accepted. However, your lowest grade on the homework — which may be an assignment that you do not hand in — will be dropped when calculating your grade.

There will be 3 tests in class, as you see on the tentative calendar above. They will be designed to easily fit in the one-hour time slot — maybe just one, or two, short problems. The questions on the tests will be similar to the problems you have done on the homework. The questions on the final exam will be similar to the tests. The system is designed to keep you up-to-date and prepared for the final exam.

Your overall grade will be calculated as follows: 10% homework, 45% tests, 45% final. Of course, other *qualitative aspects* will be considered as well. For example, if a student gets 100 on the final, then a poor performance on a test, say, may to some extent be deemphasized. Another *qualitative aspect* might be a monotonically increasing grade throughout the term.