

# PHY 3405.1

## Syllabus

Class time: 10:00am–11:15am TR.  
Class room: McNally Main 310.

Instructor: Dr. Joseph M. Hahn  
Office: McNalley Main 301-B  
Office hours: 2:30pm–3:30pm MWF  
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Class URL: <http://apwww.stmarys.ca/~jhahn/phy3405.html>

Text: *Classical Dynamics*, 5<sup>th</sup> edition, by Thorton & Marion.

### Course Content:

1. Single particle mechanics, chapter 2
2. Linear oscillations, chapter 3
3. Nonlinear oscillations and chaos, chapter 4
4. Gravity & central force motion, chapters 5 & 8
5. Calculus of variations, chapter 6
6. Langrangian and Hamiltonian dynamics, chapter 7
7. Systems of particles, chapter 9
8. Motion in a rotating reference frame, chapter 10
9. Rigid body motion, chapter 11

## Grading:

two exams, 25% each

final 25%

assigned problem sets 25%

Exam #1 will cover topics 1–4, exam #2 will cover topics 5–6, and the final exam will cover topics 7–9. Although the exams and the final are not formally comprehensive, you will still need to know how to apply the the earlier course content to the subsequent lectures, assignments, and exams.

## Expectations for the problem sets:

Your solutions to the assigned problem sets should be written in a manner that demonstrates that you understand each problem and its answer. Provide some commentary along with the math to explain key steps in the solution. Also provide sketches as needed to illustrate your solution. All sketches should be large, easily understood at a glance, and well annotated. Keep in mind that hard-to-understand solutions will score low.

Feel free to discuss the problems with your fellow students. But keep in mind that it is expected that each student will submit their own solutions that are written by their own hand in their own unique style. *Copied solutions are not evidence of a student's understanding, and both the copy as well as the source solutions will score very low.*

Examination problems will be drawn from the problems discussed in class and from the assigned problem sets. The purpose of the problem sets is to prepare you for the examinations, and majority of your time spent on this course will be consumed by these problem sets. Although the value of these problems sets is seemingly low, worth only 25% of the course's total score, do not treat them lightly since the time you invest in these assignments will pay off with higher examination scores. Also, keep in mind that I also tend to award lots of partial credit, so never leave any homework/exam problems blank.

It is recommended that you visit my office routinely to discuss the class, lectures, homework problems, exam preparations, etc. But please make an appointment in advance if you wish to visit during non-office hours.