CHAMINADE UNIVERSITY
PHY-251-01-1: UNIVERSITY PHYSICS I
COURSE SYLLABUS – FALL 2012

**Instructor:** Matthew Cochran
**Email Address:** matthew.cochran@chaminade.edu
**Office:** Henry Hall room 7
**Office Phone:** 739-8361
**Course Time:** Monday, Wednesday, and Friday from 8:30 to 9:20 and Thursday from 5:30 to 6:20
**Course Room:** Henry Hall 202
**Prerequisites:** MA-210 Concurrent enrollment in PHY-251L is assumed.
**Required Text:** R. Knight, *Physics for Scientists and Engineers,* 3rd ed., Pearson, New York, 2013.
**Other Materials:** Scientific Calculator

**COURSE DESCRIPTION:**
This course is the first part of a yearlong introductory physics sequence focusing on the application of physical principles, logical reasoning, and mathematical analysis needed to understand a broad range of natural phenomena. Topics include classical mechanics, fluid dynamics, and thermodynamics.

**EVALUATIONS AND GRADING SCALE:**

| | |
|---|---|
| Exam 1 | 20% |
| Exam 2 | 20% |
| Exam 3 | 20% |
| Final | 20% |
| Quizzes and Homework | 20% |

| | | | |
|---|---|---|---|
| 90% | – | 100% | A |
| 80% | – | 90% | B |
| 70% | – | 80% | C |
| 60% | – | 70% | D |
| 0% | – | 60% | F |

Incomplete grades (I) will be given in accordance with college regulations as outlined in the college catalog. Withdrawals (W) from the class are the responsibility of the student and deadlines are set by the college.

**EXAMS:**
There will be four examinations as part of the requirements for the course. The exams will be, by necessity, cumulative. Physics is sequential and its concepts must be learned in order. Material for exams will be drawn primarily from homework problems. Hence, the best way to review for an exam is to review homework assignments. Make-up exams will only be given under extenuating circumstances beyond the student's control.

**QUIZZES:**
A ten minute quiz will be given most weeks. Material for the quizzes will be drawn from material covered during the last week. Quizzes may be given at the beginning of class, so arrive on time. Make-up quizzes are not given.

**HOMEWORK:**
To be successful in this course, it is essential that you complete all homework assignments. Be prepared to spend three hours or more on homework every week. If you are having trouble, get help from the instructor or your classmates. Do not fall behind. Homework is due at the beginning of class. Late homework is not accepted.

**ATTENDENCE:**
Regular attendance is expected of all students. Read material prior to lecture. If a topic is still not clear after it has been discussed in class, ask questions. Time will be spent working through homework problems and reviewing for exams in addition to lecturing. You will work with partners in class. It is important that partners engage in discussion of their work and avoid working as isolated individuals.

**COURSE OBJECTIVES:**
Upon successful completion of the course, the student will be able to:

- Solve problems involving linear and rotational mechanics using algebra and trigonometry.
- Solve problems involving pressure and fluid dynamics using algebra and trigonometry.
- Solve problems involving heat and thermodynamics using algebra and trigonometry.

**MUSIC DEVICES AND CELLPHONES:**
Unless specifically permitted by your instructor, use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes at Chaminade, as it is discourteous and may lead to suspicion of academic misconduct. Students unable to comply will be asked to leave class.

**ADA ACCOMODATIONS:**
Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from CUH Counseling Center (Dr. June Yasuhara, 735-4845) by the end of the third week of classes. Failure to provide written documentation will prevent your instructor from making necessary accommodations. Please refer any questions to the Dean of Students and review procedures at:

www.chaminade.edu/student_life/sss/counseling_services.php

## TENTATIVE WEEKLY SCHEDULE:

| Week | Date | L# | Topic | Reading | Due |
|---|---|---|---|---|---|
| | Aug 27 | 1 | Course Intro; Motion Diagrams | | |
| **1** | Aug 29 | 2 | Position; Velocity; Acceleration | 1.1 to 1.7 | |
| | Aug 31 | 3 | Units | 1.8 | |
| | Sep 03 | **H1** | **Labor Day – No Class** | | |
| **2** | Sep 05 | 4 | Velocity in 1D; **Q1** | 2.1 to 2.3 | **HW1** |
| | Sep 07 | 5 | Acceleration in 1D | 2.4 to 2.6 | |
| | Sep 10 | 6 | Vectors; Trig Review; **Q2** | 3.1 to 3.4 | **HW2** |
| **3** | Sep 12 | 7 | Motion in Two Dimensions | 4.1 to 4.3 | |
| | Sep 14 | 8 | Projectile Motion | | |
| | Sep 17 | 9 | Circular Motion; **Q3** | 4.5 & 4.6 | **HW3** |
| **4** | Sep 19 | 10 | Catch Up; Review | | |
| | Sep 21 | **E1** | **EXAM 1 – Chapters 1 to 4** | | |
| | Sep 24 | 11 | Forces and Newton's Laws | 5.1 to 5.7 | |
| **5** | Sep 26 | 12 | Free Body Diagrams | | |
| | Sep 28 | 13 | Statics | 6.1 | |
| | Oct 01 | 14 | Mass and Weight; **Q4** | 6.2 & 6.3 | **HW4** |
| **6** | Oct 03 | 15 | Friction and Drag | 6.4 to 6.6 | |
| | Oct 05 | 16 | Second Law Examples | | |
| | Oct 08 | **H2** | **Discoverer's Day – No Class** | | |
| **7** | Oct 10 | 17 | Newton's Third Law; **Q5** | 7.1 to 7.3 | **HW5** |
| | Oct 12 | 18 | Ropes and Pulleys | 7.4 & 7.5 | |
| | Oct 15 | 19 | Dynamics in Two Dimensions; **Q6** | 8.1 & 8.2 | **HW6** |
| **8** | Oct 17 | 20 | Fictitious Forces | 8.4 | |
| | Oct 19 | **E2** | **EXAM 2 – Chapters 5 to 8** | | |
| | Oct 22 | 21 | Momentum and Impulse | 9.1 & 9.2 | |
| **9** | Oct 24 | 22 | Conservation of Momentum; Momentum in 2D | 9.3 to 9.6 | |
| | Oct 26 | 23 | Conservation of Energy | 10.1 to 10.3 | |
| | Oct 29 | 24 | Hook's Law and Energy; Elastic Collisions; **Q7** | 10.4 to 10.7 | **HW7** |
| **10** | Oct 31 | 25 | Work; Dot Product | 11.1 to 11.3 | |
| | Nov 02 | 26 | Work and Potential Energy; Power | 11.4 to 11.6 | |
| | Nov 05 | 27 | Rotational Motion; **Q8** | 12.1 to 12.3 | **HW8** |
| **11** | Nov 07 | 28 | Torque and Statics | 12.5 & 12.8 | |
| | Nov 09 | 29 | Simple Harmonic Motion | 14.1 to 14.4 | |
| | Nov 12 | **H3** | **Veteran's Day – No Class** | | |
| **12** | Nov 14 | 30 | Simple Harmonic Motion Examples; **Q9** | 14.5 & 14.6 | **HW9** |
| | Nov 16 | **E3** | **EXAM 3 – Chapters 9 to 12, 14** | | |
| | Nov 19 | 31 | Fluids; Density; Pressure | 15.1 to 15.4 | |
| **13** | Nov 21 | 32 | Buoyancy; Dynamics | 15.4 to 15.5 | |
| | Nov 23 | **H4** | **Thanksgiving – No Class** | | |
| | Nov 26 | 33 | Ideal Gas Law; **Q10** | 16.1 to 16.4 | **HW10** |
| **14** | Nov 28 | 34 | Ideal Gas Processes | 16.5 | |
| | Nov 30 | 35 | Work and Ideal Gasses | 17.1 & 17.2 | |
| | Dec 03 | 36 | Heat and the First Law of Thermodynamics; **Q11** | 17.3 & 17.4 | **HW11** |
| **15** | Dec 05 | 37 | Thermal Properties of Matter | 17.5 & 17.6 | |
| | Dec 07 | 38 | Review | | |
| finals | Dec 13 | **FE** | **CUMULATIVE FINAL – 8:30 to 10:30** | | |