

PHYS 161 – Term Syllabus – Spring 2019

Department of Engineering, Physical & Computer Sciences
Montgomery College, Rockville

PHYSICS 161 - GENERAL PHYSICS I

Course Description: First of three related courses (with PHYS 262 and PHYS 263). A calculus-based general physics course, required for students majoring in engineering or one of the physical sciences. This sequence is planned as a unified course of study with continuity of presentation across the semester boundaries. It is strongly recommended that students plan to complete the sequence in consecutive semesters. PHYS 161, Mechanics, covers fundamental laws of motion, force and energy, particle collisions, rotational mechanics, gravitation, simple harmonic motion, and pendula. (NSND) (CE: G and T)

PREREQUISITES: MATH 181 and concurrent enrollment in MATH 182, or consent of department. Three hours lecture, one hour discussion each week.

Course Outcomes:

Students will be able to:

- Demonstrate a conceptual understanding of physical principles associated with mechanics.
- Solve physics problems involving mechanics and heat using both mathematical and physical principles.
- Apply the scientific method to investigations of physical concepts associated with mechanics.
- Clearly communicate the results of investigations of physical concepts associated with mechanics.

PHYS161/262 Course Center:

SW 314. Coaching, Peer tutoring. Hours: MW 9 to 10, 11 to 12, 1 to 2, 3 to 4, TR 4 to 5.

| | | |
|--------------------|---------------------------|-------------------|
| Exams: | Sat 2/9, 3/9, 4/13 | 10-11:30am |
| Final Exam: | Sat 5/11 | 10-12 Noon |

- Make-up exams will not be administered following each of these dates.
- Must bring MC ID and signed printout of exam cover page to examination hall.

Instructor Coordinates:

Instructor: Dr. Arya Akmal
Office/Phone: SC 436G, (240)567-7606
Office Hours: TBA
email: Arya.Akmal@montgomerycollege.edu

Instructor: Dr. Joe Connor
Office/Phone: SC 441, (240)567-5230
Office Hours: By Appt.
email: Joseph.Connor@montgomerycollege.edu

Instructor: Dr. Tania De
Office/Phone: SC 436A, (240)567-5230
Office Hours: TBA
email: Tania.De@montgomerycollege.edu

Instructor: Dr. Hollis Williams
Office/Phone: SC 436K, (240)567-4129
Office Hours: TBA
email: Hollis.Williams@montgomerycollege.edu

Instructor: Dr. Helio Zwi
Office/Phone: SC 436P, (240)567-4129
Office Hours: MW 11–12 at SW 314, M 2–3 at SC 436P, W 2–4 at SC 436P
email: Helio.Zwi@montgomerycollege.edu

Required Course Materials:

- **Website:** access to FlipItPhysics.com
- **Textbook:** One of the following is required:
 - *Sears and Zemansky's University Physics, Vol.I, 13th or 14th Ed.* by Young & Freedman
 - [*Openstax University Physics, Volume I*](#)

Grading:(3 Credits): A, B, C, D, F, I (P, AU, S, U, W)

Note that this policy is intended as a guide and is subject to change with notification

(1) 3 Tests @15%: 45%

2/9, 3/9/ 4/13

NO CALCULATORS PERMITTED

(2) Final Exam: 25%

5/11

Comprehensive final exam

(3) Quizzes/HW: 15%

In-class most Fridays.

(4) Online Exercises: 5%

Due each week, with additional partial credit deadlines before each exam.

(5) Pre-lecture and Checkpoint Assignments: 5%

Completed online on Flippit Physics

(6) Classwork: 5%

Mini-labs and discussion problems completed in class on weeks without quizzes.

Grading scale: A >90%, B >80%, C >70%, D >60%, F <60%

| Week | Date | PL/CP | Lecture | HW | Quiz | Mini-Lab |
|------|----------------------|--|-------------------------------|------|---------|-----------------------|
| 1 | Mon 1/21 | MLK Holiday | | | | |
| | Wed 1/23 | | 0, 1: Intro / 1-D kinematics | | | |
| | Fri 1/25 | 1 | 1: 1-D Kinematics | | | (discussion problems) |
| 2 | Mon 1/28 | 2 | 2: 2-D Kinematics | 1 | | |
| | Wed 1/30 | | Problem solving | | | |
| | Fri 2/1 | | review | 2 | Quiz #1 | #2 – Adding vectors |
| 3 | Mon 2/4 | 3 | 3. Relative & Circular Motion | | | |
| | Wed 2/6 | | | | | (discussion problems) |
| | Fri 2/8 | | Problem solving | 3 | Quiz #2 | (discussion problems) |
| | Sat 2/9 | Exam 1 (units 1–3) 10:00–11:30 AM SW301 (Science West Lecture Hall) | | | | |
| 4 | Mon 2/11 | 4, 5 | 4. Newton's Laws | | | |
| | Wed 2/13 | | 5. Free body Diagrams | | | |
| | Fri 2/15 | | review | 4, 5 | Quiz #3 | #4 – Friction |
| 5 | Mon 2/18 | 6, 7 | 6. Friction | | | |
| | Wed 2/20 | | 7. Work & Energy | | | |
| | Fri 2/22 | | review | 6, 7 | Quiz #4 | #5 – Inclined Plane |
| 6 | Mon 2/25 | 8, 9 | 8. Potential Energy | | | |
| | Wed 2/27 | | 9. General Work and Energy | | | |
| | Fri 3/1 | | review | 8, 9 | Quiz #5 | |
| 7 | Mon 3/4 | | Problem solving | | | (discussion problems) |
| | Wed 3/6 | | Problem solving | | | (discussion problems) |
| | Fri 3/8 | | Review | | | |
| | Sat 3/9 | Exam 2 (units 4–9) 10:00–11:30 AM SW301 (Science West Lecture Hall) | | | | |
| 8 | Mon 3/11 to Fri 3/15 | SPRING BREAK | | | | |

| Week | Date | PL/CP | Lecture | HW | Quiz | Mini-Lab |
|------|------------------------|--|----------------------------------|--------|----------|-------------------------|
| 9 | Mon 3/18 | 10, 11 | 10. Center of Mass | | | |
| | Wed 3/20 | | 11. Momentum Conservation | | | |
| | Fri 3/22 | | discussion | 10, 11 | Quiz #6 | |
| 10 | Mon 3/25 | 12, 13 | 12. Elastic Collisions | | | |
| | Wed 3/27 | | 13. Impulse | | | |
| | Fri 3/29 | | discussion | 12, 13 | Quiz #7 | #7 – Ballistic Pendulum |
| 11 | Mon 4/1 | 14, 15 | 14. Rotational Kinematics | | | |
| | Wed 4/3 | | 15. Par. Axis Theor. & Torque | | | |
| | Fri 4/5 | | discussion | 14, 15 | Quiz #8 | #8 – Moment of Inertia |
| 12 | Mon 4/8 | 16 | 16. Rotational Dynamics | | | |
| | Wed 4/10 | | Problem Solving | | | (discussion problems) |
| | Fri 4/12 | | Problem Solving | 16 | | (discussion problems) |
| | Sat 4/13 | Exam 3 (units 10–16) 10:00–11:30 AM SW301 (Science West Lecture Hall) | | | | |
| 13 | Mon 4/15 | 17, 18 | 17. Rotational Equilibrium | | | |
| | Wed 4/17 | | 18. Stability | | | |
| | Fri 4/19 | | | 17, 18 | Quiz #9 | |
| 14 | Mon 4/22 | 19, 20 | 19. Angular Momentum I | | | |
| | Wed 4/24 | | 20. Simple Harmonic Motion | | | |
| | Fri 4/26 | | | 19, 20 | Quiz #10 | |
| 15 | Mon 4/29 | 21 | 21. Pendula | | | |
| | Wed 5/1 | | Problem Solving | | | (discussion problems) |
| | Fri 5/3 | | Problem Solving | 21 | | (discussion problems) |
| 16 | Mon 5/6 | | Final review (last day of class) | | | |
| | Tue 5/7 to Fri 5/10 | Finals Week | | | | |
| | Sat 5/11 | FINAL EXAM 10 AM–12 PM SW301 (Science West Lecture Hall) | | | | |

CLASSROOM POLICIES

Policy on Late Assignments: Absolutely no assignments will be accepted after official deadlines. Missing assignments will be dropped only in cases of *bona fide*, documented emergencies. Under certain circumstances, assignments will be accepted after due date (not deadline) with 10% deducted per day until graded assignments are returned to the class.

Attendance

Students are expected to attend all class sessions. "Excessive absence" is defined as one more absence than the number of times the class meets per week during a fall or spring semester (with the number of absences to be prorated for accelerated sessions.) For example, in a Monday-Wednesday-Friday class, four absences would be considered excessive. If you miss a class session, it is your responsibility to find out what you have missed.

Source: Collegewide Policies and Procedures Manual: Academic Regulations: Class Attendance (Section 9.823).

Academic Honesty

Common examples of academic dishonesty and misconduct can be found below and in the Student Code of Conduct, Section IV. These examples are not an exhaustive list of all prohibited behavior. If you are in doubt about what constitutes academic dishonesty, consult your instructor or the Student Code of Conduct.

Faculty members may choose to impose grade sanctions for violations of academic ethics, normally ranging from a minimum of an "F" on the assignment in which dishonesty occurred, to a maximum of an "F" in the course. Faculty members may choose to impose different sanctions. Faculty members also have the prerogative of referring a case to the campus Dean of Student Development with a specific request that the dean consider imposing additional sanctions. *Source: Collegewide Policies and Procedures Manual: Student Code of Conduct: Academic Dishonesty and Misconduct (Section IV).*

Classroom Conduct

The College seeks to provide an environment where discussion and expression of all views relevant to the subject matter of the class are recognized as necessary to the educational process. However, students do not have the right to interfere with the freedom of faculty to teach or the rights of other students to learn. *Source: Collegewide Policies and Procedures Manual: Student Code of Conduct: Classroom Behavior (Section III).*

Student Services

Any student who may need an accommodation due to a disability is asked to make an appointment to see me during my office hour. A letter from Disability Support Services authorizing your accommodations will be needed. Any student who may need assistance in the event of an emergency evacuation must identify to the Disability Support Services Office; guidelines for emergency evacuations for individuals with disabilities are found at: <http://www.montgomerycollege.edu/dss/evacprocedures.htm>.

Student e-mail

Student e-mail (montgomerycollege.edu) is an official means of communication for the College. You are expected to check your student e-mail account regularly, as you are responsible for information and announcements that will be sent to you from the College. For this class, student e-mail will be used only for situations where timing is essential.

Veterans

If you are a veteran on active or reserve status and you are interested in information regarding opportunities, programs and/or services, please visit the Combat2College website at: <http://www.montgomerycollege.edu/combat2college>.

Arya Akmal 2012-01-11