

Physics 221 – 2013

Sections: 221 DEN

Instructor: Dr. George R. Bart
Office: Rm. 3850 tel.(773) 907-4096;
Email: gbart@ccc.edu Blackboard course site: <https://ccc.blackboard.com/>
See online Teacher Profile & below for recommended website links, e.g.,
Course Links Website: <http://faculty.ccc.edu/tr-scimath/Physics.htm>
Textbook Companion Help Website: http://www.aw-bc.com/young_geller/

Office Hours: Best: Mon. & Wed., 4:50-5:15 pm; other times available by appointment

Meeting Time: Mon. & Wed., 1:00 - 4:50 pm in Rm. 3833 and, occasionally, in 3186.

Required Text etc.: COLLEGE PHYSICS, 9th Edition, H. D. Young; Pearson/ Addison Wesley 2012, ISBN10: 0321749804 OR ISBN13: 9780321749802. The text includes Mastering Physics online access OR CD to an advanced tutorial and homework system. **Other supplies** needed: A pocket scientific calculator having all functions. You are expected to know how to use your calculator. If you don't know how to use your calculator, then learn how to use it during the first week of class. Please, carry it with you in class, always; you will be asked to use it in class.

Course Content: These are a lecture, workshop, and laboratory trigonometry-based first course in physics. The Physics 221 courses serve the same purpose as the courses Physics 104, 105 & 106 jointly serve at the University of Illinois Chicago, where many of our students seek to transfer. Thus, it provides discussion, lab, tutorial, workshop, and computer simulation activity time. At UIC the courses 104, 105 & 106 total 9 contact hours and additionally have evening examinations. At Truman the course 221 totals 8 contact hours. Thus, transferring credit to UIC, or elsewhere, is no problem. The course is intended for students who already have taken a trigonometry course but it may be taken concurrently. Subject matter includes the study of mechanics, fluid mechanics, elasticity theory, waves in elastic media and sound. Specifically, the course covers the study of vectors, forces, equilibrium of a particle and rigid body, rectilinear motion, plane motion, Newton's laws, gravitation, work and energy, impulse and momentum, rotation, harmonic motion, elasticity, hydrostatics, hydrodynamics, waves in elastic media, sound waves, some relativity theory and heat. **The Catalog Description is below.**

WAC: Writing Across the Curriculum (WAC) assignments will be required as appropriate to the topics.

Laboratory work: The lab components reinforce concepts introduced in the course lectures. These are done in a contextual, hands-on, small group settings. Often individual quizzes will be given at the end of the period to assess what each student learned from the lab. Then the lab grade will be the quiz grade. Students are allowed to use their lab notes when completing the quizzes. For some labs, there will not be an associated lab quiz. In these cases, lab reports may be collected and graded.

A longer more detailed syllabus is provided on the first day of class.

**CONCISE COURSE INFORMATION
PHYSICS 221 - DR. BART**

Truman Gen Ed Goals

This course addresses the Truman College General Education Goals:

- The student exhibits social and ethical responsibility and is aware of her or his place in the global community.
- The student performs effectively in the workplace and has the ability to work and make effective use of a wide variety of current technologies.
- The student communicates effectively in both written and oral formats.
- The student demonstrates the ability to think critically, abstractly, and logically.
- The student gathers interprets and analyzes data.

CATALOG LISTING OF PHYSICS 077 0221 – Mechanics, Waves and Heat Credit Hours: 5

Foundations and concepts in Physics, including elementary problems in mechanics, wave, motion and heat. Writing assignments, as appropriate to the discipline, are part of the course.

Prerequisites: Grade of C or better in Math 141, or higher or concurrent enrollment in Math 141 or Math 143, and Eligibility for English 101 or Consent of Department Chairperson.. 4 lecture hours and 4 lab hours per week based on 16 weeks.

ASSIGNMENTS

A standing assignment is to read the current textual material before coming to class, as stated in the course outline and as handed out in class. Additional assignments will be given out at appropriate times. These are to be done at home after you have studied the chapter. If they are to serve their purpose, you should do them alone. Bring them to the next session so that we may discuss any points you don't understand. The weekly assignment provides a check of how well you are studying.

Because you will encounter a large number of definitions in this course that will probably be new to you, I suggest that you keep good notes or at least a vocabulary list of the new words you encounter and their meanings. The notes will be an aid in reviewing for exams. It is important not to get behind on memorizing the meaning of words and concepts new to you. Otherwise, you will be overwhelmed by the end of the course.

HOMEWORK and CLASS PARTICIPATION

Doing homework will increase your chances of success in this class. It typically will consist of doing weekly problems, reading the weekly lab instruction handout, and writing a lab report. If you miss a class you will need to request, any handouts or homework assignments you missed. Some classes will involve interactive class participation using a clicker personal response system. Class participation points will be awarded to augment the homework grade.

EXAMS

There will be several short quizzes at the end of several of the lab sessions. All quizzes will be multiple choices and will be announced in advance.

GRADING

The final course grade in Physics 221 will be determined by the following system. For performance reference the individual activities can be graded on a raw score percentage scale.

F = less than 45%

D = 45 - 54%

C = 55 - 64%

B = 65 - 74%

A = 75% or above

The final average lab and homework grades will be combined with the other grades to arrive at the final letter grade. Normally this enhances the overall grade, which is the main grade for transfer purposes.

MIDTERM GRADES

At midterm, overall assessment letter grades A, B, . . . , F will be recorded for each student based upon their scores on required assessment assignments such as major tests, lab reports, homework, and quizzes. Any missing assignments are scored as zero. However, if one major test or any two or more other assignments of one type are scored zero, the midterm evaluation will be that the student is not actively pursuing the course and the midterm grade will be recorded as ADW (administrative withdrawal). You must complete assignments to avoid an ADW.

ATTENDANCE

A student with more than 3 absences and a current test average below D will be given an automatic F. A missed activity of any kind will be scored zero. **No make-ups will be allowed for unexcused missed activities!** A make-up test for a missed activity may be allowed, depending on a serious excuse and a promptly made appointment with the teacher.

GradesFirst will be used to provide early notice of personal student difficulty in this class. *If your coursework is deficient in the course initial weeks, the GradesFirst system will generate an email to you and will also keep track of that. Your advisor should be listed in GradesFirst. If there is not an advisor listed, we recommend that you reach out to the Advising Office and ask that one be assigned. Advisors can be very helpful as you navigate your academic path at CCC. Log in to GradesFirst at ccc.gradesfirst.com using your CCC username and password. This is the same username and password you would use for Blackboard and email.*

ACADEMIC INTEGRITY

This course implements the CCC Academic Integrity policy. The CCC has no tolerance for violations of academic integrity. The student policy manual states, "Plagiarism and cheating of any kind are serious violations of these standards and will result, minimally, in the grade of 'F' by the instructor" (39). All course work will be checked for Academic Integrity. In this course, the first violation will result in an "F" for the assignment; the second violation will result in course failure. Make-ups and revisions are not available after an infraction of academic integrity.

ACADEMIC SUPPORT SERVICES

Numerous academic support services are available to students of Truman College. Some are:

Student Services Department. It assists students in selecting an academic pathway that aligns with their career goals, provides ongoing support through completion and graduation, offers career and transfer assistance, supports student clubs and organizations, and provides support for veterans and students with disabilities. See:

<http://tinyurl.com/6prvec5>

Tutoring Center. For students who need help with their assignments: McKeon Administrative Building Room 162, 773-907-4785 or 4790, <http://tinyurl.com/7a8o9ty>.

Student Success and Leadership Institute (SSLI). For students who need various other support services to achieve their educational goals: McKeon Administrative Building Room 162, 773-907-4714. <http://tinyurl.com/75avz7a>

TRIO Student Support Services. For low-income students, first generation college students, or students with disabilities who need academic support: Room 1435, 773-907-4797, <http://tinyurl.com/6qdwmc9>.

Registration is required at the start of each semester.

Disability Access Center. The Center verifies needs pursuant to the American Disabilities Act (ADA), determines student academic accommodations, and issues accommodation letters. Registration is required at the start of each semester. : Room 1435, 773-907-4725, <http://tinyurl.com/7tkvh88>.

THE WELLNESS CENTER. Support and help is provided via:

- Personal counseling
- Support groups
- Stress and time management coaching
- Referrals to Community Resources

It is located in Room 1946 of the Main Building, 773-907- 4786. See: <http://tinyurl.com/8uvzd6v>

FERPA

FERPA (Family Educational Rights and Privacy Act) is a federal law that protects the privacy of student educational records. Faculty cannot reveal information about students, or discuss student records over the phone or unsecure e-mail. CCC student e-mail meets FERPA requirements. See: www.ed.gov/policy/gen/guid/fpco/ferpa/index.html.

TOPICAL OUTLINE AND SCHEDULE FOR PHYSICS I

TEXT BOOK:

**COLLEGE PHYSICS, 9th Edition,
Young, Pearson/ Addison Wesley 2012.**

The text includes Mastering Physics online access or
a CD with advanced tutorial and homework system for optional use.

**Dr. Bart
Office 3850
773-907-4096
MW 4:50-5:15**

SUPPLEMENTARY MATERIALS:

See the recommended Internet links at on the CCC Blackboard Course Website

<u>UNIT</u>	<u>ASSIGNMENT</u>	<u>YOUNG'S TEXT</u>	
		<u>PAGES</u>	<u>CHAPTER</u>
1	Review: Math, Vectors Measurement	0-28 A1-A6	0; 1 Appendices A-E
2	One Dimensional Motion Planar Motion	29-67 68-98	2 3
3	Particle Dynamics & Forces I	99-127	4
4	Particle Dynamics & Forces II	128-144; 161-169	5.1 - 5.3; 6.1 - 6.2
TEST I			
5	Work and Energy	188-208	7.1 -7.5
6	The Conservation of Energy	208-230	7.6 - 7.8
7	Particle Systems Dynamics	231-239, 251-253	8.1 - 8.2, 8.6 - 8.7
8	Collisions: Impulse & Momentum	239-251	8.3 - 8.5
TEST II			
9	Rotational Motion I	267-281	9-1 thru 9-4
10	Rotational Motion II	281-293; 294-311	9-5, 10-1 thru 10-5
11	Rigid Body Equilibria	311-332	10-6, 7
12	Oscillations	145-147, 333-364	5-4, 11
13	Gravitation	170-187	6-3, 4, 5
TEST III			
14	Elementary Fluid Mechanics	407-441	13
15	Classical Wave Theory & Sound Waves	365-406	12
16	Heat	441-476	14
FINAL EXAM			

BRIEF PHYSICS 221 COURSE OBJECTIVES (STUDENT LEARNING OUTCOMES)

Upon completion of these courses, the student should be able using algebra and trigonometry to:

1. Use skills of scientific reasoning and conceptual and computational problem solving.
2. Apply vectors to solve problems.
3. Use the equations of rectilinear motion and free fall to solve problems.
4. Apply the concepts of plane motion to solve problems.
5. Use the equations of projectile and circular motion to solve problems.
6. Apply Newton's three laws of motion to practical situations.
7. Use work, energy and heat principles to analyze physical situations.
8. State and apply conservation of energy and momentum principles.
9. Analyze and solve rotational kinematics and dynamics problems involving moments of inertia and angular acceleration.
10. Solve problems related to the equilibrium of a rigid body.
11. Solve problems related to mechanical oscillations including springs, simple and physical pendulums and other oscillatory systems.
12. Apply the principles of fluid mechanics to solve problems.
13. Use Newton's law of universal gravitation to various problems in physics and astronomy.
14. Apply the principles of wave motion to solve problems transverse and longitudinal waves, superposition, etc.
15. In a clear manner, describe problems and present their solutions in homework, exams and laboratory reports.
16. Use various instruments to measure physical quantities in the lab.
17. Use modern technology to analyze and solve physics problems (computers, etc.).

LIST OF PHYSICS EXPERIMENTS/ACTIVITIES

Students will perform a selection of activities, like those in this list, as determined by the instructor.

1. Introduction (reports, hand and computer graphing, computer algebra calculations, errors and error analysis)
2. Measurement of Length with Vernier Caliper
3. Measurement of small Lengths with Micrometer Caliper- Density of Solids
4. Graphs and Tracks Computer Simulation
5. Composition of Concurrent Forces- Force Table
6. Interactive Internet Software Activities
7. Coefficient of Friction
8. Uniformly Accelerated Motion- Atwood's Machine
9. Equilibrium of a rigid body
10. Centripetal Force
11. Momentum Ballistics- Ballistic Pendulum
12. Balanced Torques and Center of Gravity
13. Young's Modulus of Elasticity
14. Simple Pendulum
15. Simple Harmonic Motion- Spring Force Constant
16. Archimedes' Principle
17. Torsional Pendulum-Determination of the Newtonian Constant of Gravitation G
18. Resonance in air columns
19. Laws of vibrating strings- Standing waves in a string

By Using the Air Cushion Table (ACT):

20. Introduction of ACT-Analysis of a trace-Uniform Motion
21. Rectilinear Motion with constant acceleration a
22. Plane Motion- Projectile Motion
23. Newton's second Law
24. Conservation of Momentum- Elastic and Inelastic Collisions
25. Conservation of Energy in an isolated system
26. Study of Angular Momentum
27. Determination of an unknown force by energy measurements