

**PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS**

**ENGINEERING FUNDAMENTALS I
ENS 1510**

Lecture/Lab Hours: 3 / 3

Credit Hours: 4

Date Revised: Spring 2017

Catalog Course Description

Calculus-based study of basic physics concepts, including vectors, kinematics, Newton's Laws, work-energy and impulse-momentum. Introduction to teamwork. Introduction to the engineering disciplines, examination of engineering principles and design issues; oral and written presentation skills.

Co-requisites

MATH 1910

Textbooks and Other Supplies

Physics for Scientists and Engineers eBook: Tipler and Mosca, Webassign Premium 1 semester access.

Week/Unit/Topic Basis

Week	Topic
1	Introduction to Physics for Engineers
2	One Dimensional Kinematics
3	Two and Three Dimensional Kinematics
4-7	Newton's Laws and Forces
8-9	Work and Energy
10	Momentum and Collision
11-12	Rotation of Rigid Bodies
13-14	Angular Momentum and Torque, Review
15	Final Exam Period

Course Goals

NOTE: Roman numerals after course goals reference the University Parallel Transfer program (General Education Goals).

The course will

- A. Develop the student's awareness of the need to use a variety of learning methods in order to grasp fundamental engineering concepts. (I, V, VI,VII)
- B. Expand the student's knowledge particle dynamics using the kinematics of particles, kinetics of particles and work-energy methods of solving problems. (V, VI)
- C. Expand the student's knowledge of basic rigid body dynamics for objects in pure rotation and constrained general plane motion. (V, VI)
- D. Enhance the student's ability to work with a team and to complete hands-on laboratory experiments and projects. (I, V, VI,VII)

Expected Student Learning Outcomes

NOTE: Capital letters after Expected Learning Outcomes reference the course goals listed above.

The student will

1. Take responsibility for their learning by reading the textbook material prior to the lecture, attending and participating in lecture and laboratory, completing all assignments and laboratories, collaborating with peers, using tutors in the PSCC Learning Center, meeting with the instructor during office hours, and using outside sources such as study guides and internet sites. (A)
2. Use mathematical techniques, including calculus, to determine displacement, velocity, and acceleration of particles, including rectilinear and curvilinear motion. (B)
3. Employ vectors and vector math to analyze dynamics problems. (B, C, D)
4. Apply dimensional analysis to insure correctness of solution concerning units. (B, C,D)
5. Use Newton's First Law to solve problems dealing with forces on an object at rest or moving at a constant velocity. (B)
6. Use Newton's Second and Third Laws to solve problems dealing with force and acceleration, including rectilinear and curvilinear motion. (B)
7. Apply Newton's Laws of gravitation and motion to determine friction and drag forces on objects in motion. (B)
8. Use a work-energy analysis to determine forces, velocities, or displacements for objects in motion. (B)
9. Use an impulse-momentum analysis to determine forces, velocities or time elapsed for objects in motion. (B)
10. Apply mathematical techniques, including calculus, to determine linear as well as angular displacement, velocity, and acceleration of rigid bodies in both pure rotation and constrained general plane motion. (C)
11. Calculate angular and linear momentum of rigid bodies in motion.(C)

12. Participate in a positive manner with a group to complete experiments and team projects. (D)
13. Analyze a set of laboratory instructions and complete the tasks in an accurate and timely manner. (D)
14. Complete written reports and oral presentations employing correct diction, syntax, usage, grammar, and mechanics (D)

Evaluation

Testing Procedures

Five Module Exams	52%
Online Homework	15%
Comprehensive Final Exam	18%

Laboratory

Laboratory Expectations **15%**

Group experiments/projects will be completed and results will be documented in a laboratory report. All lab material will be kept in a portfolio which will also be part of the laboratory grade.

Field Work

N/A

Other Evaluation Methods

N/A

Grading Scale

A	90-100
B+	87-89
B	80-86
C+	77-79
C	70-76
D	60-69
F	Below 60

Policies

Attendance Policy

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

Academic Dishonesty

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

Accommodations for Disabilities

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. [Disability Services](#) (<http://www.pstcc.edu/sswd/>) may be contacted via [Disability Services email](#) or by visiting Alexander 130.

Safety and Equipment Abuse

Repeated safety violations will result in a reduction of final grade, at the instructor's discretion. Flagrant violations which result in equipment damage or personal injury could result in automatic failure of the course