

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

**ENGINEERING MECHANICS
ENS 2021**

Class Hours: 2.0

Credit Hours: 2.0

Lab Hours: 0.0

Revised: Spring 2011

Catalog Course Description:

Review of vector algebra. Statics of two-dimensional trusses and frames, including methods of joints and sections. Geometric properties of cross-sections, including first and second moments and location of centroid. Inertial properties of rigid bodies, including moment of inertia and location of mass center.

Entry Level Standards:

Students entering this course must have a comprehensive knowledge of mathematics, including knowledge of algebra, trigonometry, and geometry, and basic engineering physics concepts including vectors and Newton's Laws. They must have demonstrated a capacity for solving problems.

Prerequisites:

None

Corequisites:

ENS 1520

Textbook(s) and Other Course Materials:

Beer and Johnson. *Vector Mechanics for Engineers: Statics*. Most current edition. McGraw-Hill.

I. Week/Unit/Topic Basis:

Week	Topic
1	Vectors
2	Force Vectors
3	Moments of a Force
4	Particle Equilibrium
5	Particle Equilibrium
6	Rigid Body Equilibrium
7	Rigid Body Equilibrium

8	Trusses
9	Trusses
10	Frames
11	Frames
12	Mass Center
13	Second Moment of Area
14	Moment of Inertia
15	Final Exam Period

II. Course Goals*:

The course will:

- A. Develop the student's awareness of the need to use a variety of learning methods in order to grasp engineering concepts. (I, V, VI,VII)
- B. Expand the student's knowledge of vector math and how it is used in mechanics. (V, VI)
- C. Expand the student's knowledge of two and three dimensional equilibrium statics problems. (V, VI)

*Roman numerals after course objectives reference TBRs general education goals.

III. Expected Student Learning Outcomes*:

The student will be able to:

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. Perform vector operations. (B)*
3. Split forces into Cartesian vector format. (B)*
4. Add and subtract forces using vector analysis. (B)*
5. Calculate the moment of a force about a point, an axis, and a line using both scalar and vector analysis. (B,C)*
6. Calculate the moment of a couple using both scalar and vector analysis. (B,C)*
7. Draw Free Body Diagrams. (C)*
8. Calculate forces in coplanar two and three dimensional force systems. (B,C)*
9. Calculate forces at supports in two and three dimensional rigid body systems. (B,C)*

10. Determine the internal forces in each member of a two dimensional truss using both the method of joints analysis and the method of sections analysis. (B,C)*
11. Calculate the forces at each support and connection in a two dimensional frame. (B,C)*
12. Determine the center of gravity, centroid and center of mass for a body. (C)*
13. Calculate the moment of inertia for an area using the basic definition, integration, parallel axis theorem, and radius of gyration. (C)*

*Letters after performance expectations reference the course objectives listed above.

IV. Evaluation:

A. Testing Procedures: 100%

Five in-class exams (60%)
 Homework (10%)
 Comprehensive Final Exam (20%)
 Quizzes (10%)

B. Laboratory Expectations:

N/A

C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

A 92 - 100
 B+ 87 - 92
 B 82 - 86
 C+ 77 - 81
 C 70 - 76
 D 60 - 69
 F Below 60

V. Policies:

A. 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 the Learning Division, 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 the Learning Division.

B. 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.

C. Accommodations for disabilities:

Students who 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 Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at www.pstcc.edu/departments/swd/.