DYNAMICS
ENS 2310

Class Hours: 3.0 Credit Hours: 3.0
Laboratory Hours: 0.0 Revised: Fall 06

NOTE: This course is intended for University Parallel Transfer.

Catalog Course Description:

Study of the kinetics and kinematics of rigid bodies. Also covered are such topics as centers of mass and mass moments of inertia.

Entry Level Standards:

Students entering this course should be adept to applying mathematical techniques involving calculus to the solution of problems. They must have a knowledge of particle dynamics.

Prerequisites:

MATH 1920

Corequisites:

ENS 1520

Textbook(s) and Other Course Materials:


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Review of Particle Dynamics</td>
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<tr>
<td>2</td>
<td>Kinetics of Systems of Particles</td>
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<tr>
<td>3-7</td>
<td>Planar Kinematics of Rigid Bodies</td>
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<tr>
<td>8-11</td>
<td>Kinematics of Rigid Bodies, Including Newton's Laws</td>
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<tr>
<td>12-14</td>
<td>Kinematics of Rigid Bodies Bodies Involving Work-Energy, and Impulse-Momentum</td>
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<tr>
<td>15</td>
<td>Final Exam Period</td>
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II. Course Objectives*:
A. Use mathematical principles to analyze and solve problems dealing with the kinetics of kinematics of rigid bodies. I.6, VI.2, VI.3, VI.4, VI.5, VII.4, VII.5, VII.6
B. Develop skills in problem solving. I.6, VI.2, VI.3, VI.4, VI.5, VII.4, VII.5, VII.6
C. Understand the theory of motion of rigid bodies and systems of particles. I.6, VI.2, VI.3, VI.4, VI.5, VII.4, VII.5, VII.6
D. Develop skills in problem solving. I.6, VII.4, VII.5, VII.6
E. Understand the theory of motion of rigid bodies and systems of particles. I.6, VII.4, VII.5

*Roman numerals after course objectives reference goals of the university parallel program.

**III. Instructional Processes***:

Students will:

1. Participate in classroom discussions which challenge their abilities to think creatively and visualize complex spatial and mathematical relationships to solve problems. Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategy
2. Discuss the importance of personal qualities such as personal responsibility, time management principles, self-esteem, sociability, self-management, integrity and honesty in school and in the workplace, and dynamics of change in the workplace. Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Transitional Strategy
3. Discuss the importance of personal qualities such as personal responsibility, time management principles, self-esteem, sociability, self-management, integrity and honesty in school and in the workplace, and dynamics of change in the workplace. Communication Outcome, Transitional Strategy

*Strategies and outcomes listed after instructional processes reference TBR's goals for strengthening general education knowledge and skills, connecting course work to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

**IV. Expectations for Student Performance***:

Upon successful completion of this course, the student should be able to:

1. Solve problems dealing with systems of particles. A, B
2. Apply the calculus to the solution of problems dealing with plane kinematics of rigid bodies. A, B, C
3. Understand Newton's Laws and their applicability to the dynamics of rigid bodies. A, B, C
4. Solve problems dealing with motion of rigid bodies. A, B, C
5. Apply the theory of impulse and momentum to the solution of dynamics problems. A, B, C
6. Apply principles of work and energy to rigid bodies. A, B, C
7. Find moments of inertia of rigid bodies. A, B, C
8. Calculate the radius of gyration of a rigid body. A, B, C
9. Develop the powers of analysis so as to reach a logical conclusion. A, B, C

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

V. Evaluation:

A. Testing Procedures:

The percentage that each of the above factors count and the frequency of tests and homework is left to the discretion of the instructor, but the following is offered as a guide:
- Homework: 10%
- Quizzes: 10%
- Chapter or Topic Tests: 60%
- Final Exam: 20%

No make-up tests will be administered. In case of medical problems, notify the instructor prior to the absence.

B. Laboratory Expectations:

N/A

C. Field Work:

Outside reading of material in the college library will be required in this course.

D. Other Evaluation Methods:

N/A

E. Grading Scale:

- A 93 - 100
- B+ 88 - 92
- B 83 - 87
- C+ 78 - 82
- C 70 - 77
- D 60 - 69
- F Below 60

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course (Pellissippi State Catalog). Individual departments/programs/disciplines, with the approval of the vice president of Academic
and Student Affairs, may have requirements that are more stringent. Regular attendance in this course is required. Students who miss the equivalent of 10% of classroom hours may, at the discretion of the instructor, be dropped one letter grade. Students who arrive late for class after the roll has been called have the responsibility of seeing the instructor after class to change their status from A (absent) to T (tardy).

B. Academic and Classroom Misconduct:

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. In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or zero for the assignment or (2) an F for the course.

C. Accommodations for disabilities:

If you need accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Please see the instructor privately after class or in his/her 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 or 131 or by phone: 694-6751(Voice/TTY) or 539-7153.