PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

DYNAMICS
ENS 2310

Class Hours: 3.0  Credit Hours: 3.0
Laboratory Hours: 0.0  Date Revised: Summer 01

NOTE: This course is intended for University Parallel Transfer.

Catalog Course Description:
A continuation of ENS 1310 - Particle Dynamics, dealing with the kinetics and kinematics of Rigid Bodies rather than particles. Also covered are such topics as centers of mass and mass movements 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:
ENS 1310, MATH 1920

Textbook(s) and Other Reference Materials Basic to the Course:

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1-2</td>
<td>Review of Particle Dynamics</td>
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<tr>
<td>2-4</td>
<td>Kinetics of Systems of Particles</td>
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<tr>
<td>4-7</td>
<td>Planar Kinematics of Rigid Bodies</td>
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<tr>
<td>7-10</td>
<td>Kinematics of Rigid Bodies, Including Newton's Laws</td>
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<tr>
<td>10-14</td>
<td>Kinematics of Rigid Bodies Bodies Involving Work-Energy, and Impulse-Momentum</td>
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<tr>
<td>15</td>
<td>Review</td>
</tr>
<tr>
<td>16</td>
<td>Final Examination</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.5, III.1, III.2

B. Develop skills in problem solving. III.1, III.2

C. Understand the theory of motion of rigid bodies and systems of particles. I.5, III.1, III.2

*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. **Problem Solving and Decision Making 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. **Personal Development Outcome, Cultural Diversity and Social Adaptation Outcome, Transitional Strategy**

*Strategies and outcomes listed after instructional processes reference Pellissippi State’s goals for strengthening general education knowledge and skills, connecting coursework 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 Dishonesty:

The policy stated in the Student Handbook (found in the PSTCC catalog) will be followed in the event of cheating.