PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

STATICS
ENS 2110

Class Hours: 3.0  Credit Hours: 3.0
Laboratory Hours: 0.0  Date Revised: Fall 2015

Catalog Course Description:
A traditional study of static equilibrium including vectors, forces, moments, equivalent force systems, free-body diagrams, shear and bending moment diagrams, equilibrium, frames, trusses and friction.

Entry Level Standards:
Students entering this course should be adept to applying mathematical techniques involving calculus to the solution of problems.

Co-requisites:
MATH 1920

Textbook(s) and Other Course Materials:

Required: Beer and Johnson. Connect Plus Engineering 2 Sem Access Card For Vector Mechanics (for Pellissippi State Community College)


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Mechanics</td>
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<tr>
<td>2-4</td>
<td>Force Systems</td>
</tr>
<tr>
<td>5-9</td>
<td>Equilibrium, Distributed Forces, Shear/Bending Moment Diagrams</td>
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<tr>
<td>10-11</td>
<td>Structures</td>
</tr>
<tr>
<td>12-13</td>
<td>Friction</td>
</tr>
<tr>
<td>14</td>
<td>Centers of Mass, Centroids, Distributed Forces</td>
</tr>
<tr>
<td>15</td>
<td>Comprehensive Final Exam</td>
</tr>
</tbody>
</table>

II. Course Goals*:
The course will:

A. Expand the student’s understanding of vector based mechanics of objects at rest or moving
with constant velocity. V.4

B. Extend the student’s comprehension of static equilibrium for two and three dimensional rigid bodies. V.4

C. Guide the student to a better understanding of how to use static analysis to design mechanical components and structures. V.4

D. Enhance the student’s critical thinking and problem solving skills. I.1

E. Expand the student’s ability to analyze and evaluate written technical information. I.1

*Roman numerals after course objectives reference goals of the Engineering Science program.

III. Expected Student Learning Outcomes*:  

Students will be able to:

1. Apply the basics of trigonometry in breaking forces down into a system of components. A
2. Compute the moment about a designated point caused by various force systems. A
3. Apply dimensional analysis to insure correctness of the solution as far as units are concerned. A
4. Find the resultant of more than two forces in both a coplanar and non-coplanar situation. A
5. Apply the basics of force analysis to the equilibrium of a system. B
6. Draw a complete free body diagram of a system. B
7. Solve equilibrium problems involving distributed forces. A
8. Draw shear and bending moment diagrams to evaluate internal conditions of an object C
9. Solve for forces in the members of a truss by the method of sections and the methods of joints. B
10. Solve for forces in the members of frames or machines C
11. Solve for frictional forces due to sliding friction on level surfaces and on an inclined plane. B
12. Solve for belt friction
13. Find the centroid or center of gravity of both a homogeneous and non-homogeneous body. C

* Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

IV. Evaluation:

A. Testing Procedures: 100% of Total Grade

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:
Unit Tests 60% of Total Grade
Homework Problems 10% of Total Grade
Quizzes 10% of Total Grade
Final Exam 20% of Total Grade

B. Laboratory Expectations:

NA

C. Field Work:

Outside reading is recommended, and the Pellissippi State library will be utilized in the conduct of this course.

D. Other Evaluation Methods:

NA

E. Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100</td>
</tr>
<tr>
<td>B+</td>
<td>87 - 89</td>
</tr>
<tr>
<td>B</td>
<td>80 - 86</td>
</tr>
<tr>
<td>C+</td>
<td>77 - 79</td>
</tr>
<tr>
<td>C</td>
<td>70 - 76</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69</td>
</tr>
<tr>
<td>F</td>
<td>Below 60</td>
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</table>

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 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.

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.

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

C. 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 may be contacted by sending email to disabilityservices@pstcc.edu, or by visiting Alexander 130. More information is available at http://www.pstcc.edu/sswd/.