CIVL 2131 - Statics

Introduction

“He did each single thing as if he did nothing else.”
– Charles Dickens

Syllabus Information

- Prerequisites: MATH 1920 and PHYS 2110 and PHYS 2111
- Course Meetings: Lecture: MWF; 8:00 to 8:55 AM; ET 233
- Instructor: Dr. Paul Palazolo; Office EN 108 A
Syllabus Information

- email: ppalazol@memphis.edu
- Office Hours: “Open Door” or by appointment
  R. C. Hibbeler – Prentice Hall, 13th
  Turning Technologies, ResponseCardNXT
- CourseWeb: www.ce.memphis.edu/2131

Course Description

- Analysis of two and three dimensional force systems; centroids and moments of inertia; friction
Learning Objectives

- Correctly determine the reactions from common supports, incorporate these into a correct free body diagram of a system in static equilibrium, and solve for unknown forces and moments based on the expressions of static equilibrium.

Learning Objectives

- Correctly calculate the centroid and moment of inertia of a two dimensional shape using methods of calculus.
Learning Objectives

- Correctly calculate the centroid and moment of inertia of a two dimensional shape using methods of composite sections.

Learning Objectives

- Utilize friction concepts when appropriate in the solution of a system in static equilibrium.
Learning Objectives

- These are the minimum outcomes that you must be able to do to pass the class.

Syllabus

- The final grade for the class will be based on the following:

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<thead>
<tr>
<th>Grade</th>
<th>Composite Average</th>
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<tbody>
<tr>
<td>A</td>
<td>&gt;=90</td>
</tr>
<tr>
<td>A-</td>
<td>&gt;=87</td>
</tr>
<tr>
<td>B+</td>
<td>&gt;=83</td>
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<tr>
<td>B</td>
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<tr>
<td>B-</td>
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<td>C+</td>
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<td>&gt;=60</td>
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Homework

- Homework problems will be assigned almost every class. AT THE BEGINNING of each class, students will be selected at random to submit the assignment from the previous class.
- Absent or tardy students will automatically receive a 0 on that assignment if their name is called for submission.
- You may not submit a homework problem if you arrive late.
### The When

- Class starts at 8 AM
- Just like a job, you are expected to be on time
- It may seem like a pain to you but that is the way "real" jobs are and this is your current job

### The Why

- You cannot predict the behavior of a mechanical system unless you can correctly identify all of the forces acting on the system
- This is a fundamental course in the engineering problem solving method
- Statics questions are some of the easiest on the Fundamentals of Engineering exam
What Tools You Should Have

- Algebra
- Trig (Sine, Cosine, Tangent)
- Simple Integration
- Some geometry (no proofs necessary)
- Vectors
- Cross Product
- Dot Product
- Unit Vector

1. The force that is aligned along B is perpendicular to the force that is aligned along A, what is the value for the angle θ?
2. What are the horizontal and vertical components of the force $F_1$?

3. What is the magnitude of the sum of the force vectors $F_1$ and $F_2$?
4. What is the angle between the vector $F_1$ and the line parallel to $F_2$ at the top of the drawing?

5. What is the unit vector along the force $F_1$?

- $F_1 = 80$ lb
- $F_2 = 130$ lb
6. What is the length of the vector $\mathbf{r}$?