

CE 99 Statics

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Office hours

T-Th 12:30 to 1:30 pm

M-W 9:00 to 9:50 am

Course objectives:

1. To learn the fundamentals of analysis of static equilibrium of a rigid body in two and three dimensions

Student learning outcomes: The student will demonstrate the ability to:

- a) Draw a free body diagram (FBD) of a structure and or its components, with all loads and reactions correctly applied.
- b) Calculate resultants and equivalent force systems
- c) Correctly apply equations of static equilibrium to solve for unknown forces acting on a statically determinate structure
- d) Correctly apply equations of static equilibrium to solve for internal forces in trusses, frames and beams
- e) Find centroids and centers of gravity of two dimensional shapes
- f) Calculate moments of inertia of various shapes
- g) Analyze simple structures acted on by friction

2. To gain experience in how to set up and systematically solve engineering problems

Student learning outcomes: The student will demonstrate the ability to:

Identify the known and unknown quantities, draw a free body diagram and systematically solve equations of equilibrium.

Text: Hibbeler, "Engineering Mechanics, Statics" 12<sup>th</sup> ed., 2010

Exams: All exams are closed book and closed notes. No computers, cell phone or similar devices are allowed.

Problems: In class Problems will be unannounced and due before the class session is over.

|         |                   |     |
|---------|-------------------|-----|
| Grades: | Midterm exam      | 35% |
|         | Final exam        | 50% |
|         | In class problems | 15% |

Prereq: Math 31 and Physics 50

- Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Judicial Affairs. The policy on academic integrity can be found at [http://sa.sjsu.edu/judicial\\_affairs](http://sa.sjsu.edu/judicial_affairs)
- If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03

requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability.

- You are responsible for understanding the policies and procedures about add/drops academic renewal, withdrawal, etc. found at <http://www2.sjsu.edu/senate/S05-12.htm>
- Expectations about classroom behavior; see Academic Senate Policy S90-5 on Student Rights and Responsibilities at [http://sa.sjsu.edu/judicial\\_affairs](http://sa.sjsu.edu/judicial_affairs)
- As appropriate to your particular class, a definition of plagiarism, such as that found on Judicial Affairs website at [http://sa.sjsu.edu/judicial\\_affairs](http://sa.sjsu.edu/judicial_affairs)
- If you would like to include in your paper any material you have submitted, or plan to submit, for another class, please note that SJSU's Academic Integrity policy S04-12 requires approval by instructors."

| <u>Meeting</u> | <u>Date</u> | <u>Topic</u>                               | <u>Text</u> | <u>Problems</u>                                    |
|----------------|-------------|--|-------------|--|
|                | 24-Aug      | Roll call, introduction and administration |             |  |
| 1              | 26-Aug      | General Principles                         | 1.1 - 1.6   | 1-1, 6, 15, 21                                     |
|                |             | Forces and vectors                         | 2.1 - 2.4   | 2-2, 6, 10, 14, 34, 51                             |
| 2              | 31-Aug      | More Forces and Vectors                    | 2.5 - 2.9   | 2-59, 66, 78, 91, 113                              |
| 3              | 2-Sep       | Particle Equilibrium, FBD's, 2D & 3D       | 3.1 - 3.4   | 3-2, 15, 19, 23                                    |
| 4              | 7-Sep       | Labor day, No class meeting                |             | 3-49, 51, 57, 58                                   |
| 5              | 10-Sep      | Chap 3 cont.                               |             |  |
| 6              | 14-Sep      | Moment, Moments about a point, X product   | 4.1 - 4.4   | 4-5, 11, 39, 42                                    |
| 7              | 16-Sep      | Moment about an axis, Moment of a couple   | 4.5 - 4.9   | 4-51, 61, 75, 85<br>4-109, 114, 118, 125, 143, 149 |
| 8              | 21-Sep      | Chap 4, cont.                              |             |  |
| 9              | 23-Sep      | Faculty furlough day, no meeting           |             |  |
| 10             | 28-Sep      | Equilibrium of rigid bodies, FBD's         | 5.1 - 5.4   | 5-2, 7, 13, 15, 22, 27, 35                         |
| 11             | 30-Sep      | Equations of equilibrium, supports         | 5.5 - 5.7   | 5-63, 66, 74                                       |
| 12             | 5-Oct       | Chap 5 cont.                               |             | 5-81, 83, 87                                       |
| 13             | 7-Oct       | 2-D trusses                                | 6.1 - 6.3   | 6-2, 6, 10   |
| 14             | 12-Oct      | Frames and machines                        | 6.4 - 6     | 6-35, 37, 50                                       |
| 15             | 14-Oct      | Chap 6 cont.                               |             | 6-67, 71, 75, 82, 103, 118                         |
| 16             | 19-Oct      | Review                                     |             |  |
| 17             | 21-Oct      | Faculty Furlough Day - no meeting          |             |  |
| 18             | 26-Oct      | Midterm                                    |             |  |
| 19             | 28-Oct      | Internal Forces                            | 7.1 - 7.3   | 7-2, 6, 15, 26, 41, 47, 57                         |
| 20             | 2-Nov       | Chap 7 cont.                               |             | 7-67, 69, 74, 86                                   |
| 21             | 4-Nov       | Friction                                   | 8.1 - 8.4   | 8-3, 6, 9, 27, 34                                  |
| 22             | 9-Nov       | Friction cont.                             |             | 8-66, 71, 74                                       |
| 23             | 16-Nov      | Chap 8 Cont.                               |             | 8-150  |
| 24             | 18-Nov      | Centroids and CG's                         | 9.1 - 9.2   | 9-1, 9, 18, 51, 57, 72                             |
| 25             | 23-Nov      | Fluid pressure                             | 9.5         | 9-106, 114   |
| 26             | 25-Nov      | Chap 9 cont.                               |             |  |
|                |             |  | 10.1 -      |  |
| 27             | 30-Nov      | Moments of Inertia                         | 10.3        | 10-2, 10, 16, 17                                   |
| 28             | 2-Dec       | Moments of Inertia of Composite areas      | 10.4        | 10-33, 37, 42, 43, 56                              |
| 29             | 7-Dec       | Review                                     |             |  |