# *ME214 – VECTOR STATICS* *SYLLABUS*

Dr. Todd D. Coburn, (909) 869-2235, tdcoburn@csupomona.edu, Office: 17-2111, Office Hours: 11 AM - 1 PM TTh, 10-11 AM W, or by appointment

**Instructor:** Dr. Todd D. Coburn
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**Required Text & Tools:**

- Beer, Johnston & Mazurek, Vector Mechanics for Engineers - Statics, 10th Edition (preferred).
- Pencil, Paper (Quad or Quint Pad Recommended), Engineering or Scientific Calculator

**Prerequisites:**

- Major in ARO, CE, CME, IE, ME, or MFE.
- ENG 104 or equivalent (Freshman English I).
- MAT 115 w/ C or better (Analytic Geometry and Calculus II)
- PHY 131 w/ C- or better (General Physics)

**Corequisite:** (required for ME majors only, recommended for other majors)

- ME 224L (Mechanics Laboratory).

**Course Description:** This course includes the study of force systems, equilibrium conditions, and analytical vector mechanics as applied to practical engineering problems. It also includes force and moment equilibrium analysis of solid bodies, beams, machine members, and structures in two and three dimensions, elementary bending moment and shear analysis of simple beams, distributed beam loading, centroids, friction forces, fluid forces on submerged surfaces, virtual work, and moment of inertia.

**Course Comment:** This course is one of the fundamental courses for Mechanical, Civil, & Aeronautical Engineering. It is used by many schools as a screening tool to scare the faint-at-heart from Engineering. Principles covered in this course will be reused and expanded in Strength of Materials I & II & Lab, Mechanics & Lab, Dynamics, Fluid Mechanics, Stress Analysis, Machine Design, Finite Element Analysis, Aerospace Structures, Aerospace Structural Analysis & Design, Mechanics of Composite Materials, Structural Analysis I & II, Structural Testing Lab, Hydraulic Engineering & Lab, Structural Design – Steel/Reinforced Concrete/Timber & Labs, Foundation & Retaining Wall Design, Slope Stability & Earth Dams, Masonry Design, Earthquake Engineering, Bridge Design, and in other upper division courses. These classes cannot be mastered without also mastering Statics. Few other classes are so pivotal to producing solid engineers. Do yourself a favor. Do all the homework. Study the book from cover to cover. Ask questions. Think about the principles and concepts. Master this course, and reap the benefits in your later studies and in your engineering career.

**Classroom Rules:**

- All exams & quizzes are closed book & closed notes, unless specifically stated otherwise.
- Quizzes will be given frequently and will be unannounced.
- No make-up exams or quizzes will be administered.
- Homework is due at the beginning of the class following when it is assigned.
- Late homework will drop 10% for each calendar day late, and will only be accepted until Solutions are posted.
- Collaboration on homework is recommended. Copying homework is considered cheating.
- Cheating is unacceptable at any time, and will result in immediate failure of the class.
- Attendance is required. Students who do not attend class may be dropped from the class.
- Any student who wishes to drop the class must do so by October 10, 2012.
- Cell Phones, pagers and laptops may not be used in class.
- Use of cell phones, pagers or laptops in class will result in loss of 10% credit on work of day.
- Eating or drinking is not allowed in the classroom.

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**Work Standards:** Engineering is a precise discipline. Analytical work should be neat, clear, concise, and easy to follow. Partial credit for homework, quizzes and tests will be highly dependant on how easy it is to follow the thoughts and judgments of the student. Work that is hard to follow will lose points, even if the final answer is correct. The following standards are expected and will result in maximum credit:

- Homework should be worked on Quad (4 squares/inch) or Quint (5 squares/inch) paper. Ampad's Engineering paper (22-141, 22-142, or equivalent) is one of the best for this.
- Typically, problems should be worked on only one side of the paper, unless the paper is heavy enough that marks on the other side of the sheet are not visible at all.
- Each separate sheet of homework, quiz, or test should clearly identify the student's full name, assignment number (HW #1, HW #2, Quiz #1, Test, etc.), and page number (1 of 5, etc).
- Each problem should be clearly identified with the circled Problem Number.
- Each problem should be clearly identified with three primary sections, GIVEN, FIND, & SOLUTION, with each section title identified & underlined.
- GIVEN: List the data given in the problem statement. Usually this should be preceded or accompanied by a sketch with appropriate dimensioning and/or labeling that contains most, if not all of the given information. Absence of a piece of given information or key word often makes a problem difficult or impossible to solve.
- FIND: State what you are trying to find in this problem.
- SOLUTION: Solve the problem in a neat and logical manner. This should usually be preceded by one or more free-body-diagrams, when applicable. Each equation used should be first identified prior to substituting the appropriate values. Each step in solving the equation should be clearly shown in a linear fashion as you proceed down the page. All solutions to the problems identified in the "FIND" section should be shown to the appropriate number of significant figures and enclosed in a box, including the appropriate units and direction (as appropriate).

**Course Grading**

| | |
|---|---|
| Homework | 20% |
| Quizzes | 25% |
| Midterm | 25% |
| Final | 30% |

**Grading Scale**

| | | | | | |
|---|---|---|---|---|---|
| A | 100 % - 93 % | A- | 92 % - 90 % | | |
| B | 86 % - 83% | B- | 82 % - 80% | B+ | 89 % - 87% |
| C | 76 % - 73% | C- | 72 % - 70% | C+ | 79 % - 77% |
| D | 65 % - 61% | D- | 60 % - 56% | D+ | 69 % - 66% |
| F | 55 % - 0% | | | | |

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**Class:** ME 214, Section 8 **Lecture:** 1:00 pm – 2:15 pm TTh
**Class Number:** 21456 **Location:** Bldg 9, Room 305

## CLASS SCHEDULE

| Mtg | Date | Week | Day | Topics | Asn | Problems Assigned |
|---|---|---|---|---|---|---|
| 1 | 9/20 | 1 | Th | Intro., Chpt. 1 | 1 | HW #1 |
| 2 | 9/25 | 2 | Tu | 2.1-2.6 | 2 | HW #2 |
| 3 | 9/27 | | Th | 2.7-2.11 | 3 | HW #3 |
| 4 | 10/02 | 3 | Tu | 2.12-2.15 | 4 | HW #4 |
| 5 | 10/04 | | Th | 3.1-3.11 | 5 | HW #5 |
| 6 | 10/09 | 4 | Tu | 3.12-3.16 | 6 | HW #6 |
| 7 | 10/11 | | Th | 3.17-3.20 | 7 | HW #7 |
| 8 | 10/16 | 5 | Tu | 4.1-4.7 | 8 | HW #8 |
| 9 | 10/18 | | Th | 4.8-4.9 | 9 | HW #9 |
| 10 | 10/23 | 6 | Tu | Review | - | --- |
| 11 | 10/25 | | Th | MIDTERM | - | --- |
| 12 | 10/30 | 7 | Tu | 6.1-6.5, 6.7 | 10 | HW #10 |
| 13 | 11/01 | | Th | 6.9-6.12 | 11 | HW #11 |
| 14 | 11/06 | 8 | Tu | 8.1-8.4 | 12 | HW #12 |
| 15 | 11/08 | | Th | 8.5, 8.10 | 13 | HW #13 |
| 16 | 11/13 | 9 | Tu | 5.1-5.7 | 14 | HW #14 |
| 17 | 11/15 | | Th | 5.8, 5.10, 5.11 | 15 | HW #15 |
| 18 | 11/20 | 10 | Tu | 9.1-9.5 | 16 | HW #16 |
| --- | 11/22 | | Th | HOLIDAY | | |
| 19 | 11/27 | 11 | Tu | 9.6-9.7 | 17 | HW #17 |
| 20 | 11/29 | | Th | Review | - | --- |
| -- | 12/04 | 12 | Tu | NO CLASS | - | --- |
| 21 | 12/06 | | Th | FINAL EXAM | - | 11:30 AM – 1:30 PM |