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## Department of Architecture, Engineering, & Technology

## West Campus Building 9 room 140 – 407.582.1902

# EGN 2312 –Engineering Mechanics - Statics Fall 2018

# Textbooks: Engineering Mechanics: Statics, 14th Edition, by R.C. Hibbeler. Publisher: Prentice Hall.

# Make sure that the textbook includes MasteringEngineering student access code. If you buy a used textbook, you will have to pay to register for MasteringEngineering website access separately.

**Instructor:** Prof. M. Kar

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**Email:** [mkar@valenciaccollege.edu](mailto:mkar@valenciaccollege.edu) (prefer BlackBoard email)

**Class location**: Building 11, room 239

**Office Hours:** Tuesday / Thursday: 9:00 AM to 10:00 AM

Monday /Wednesday : 11:30 AM to 1:00 PM

Tuesday / Thursday: 1:00 PM to 2:00 PM

Friday: 9 AM to 12:00 AM (on-line)

**Prerequisite: A minimum grade of “C” in MAC 2311, MAC 2312, and PHY 2048C**

**Catalog Course Description:** (Credit: 3 hours)

Fundamental concepts of mechanics, including resultants of force systems, freebody diagrams, equilibrium of rigid bodies, and analysis of structures.

**Grading Policy:**

**Homework** 10 % **A** 90 -100 %

**Quizzes1** 10% **B** 80 – 89 %

**Two Tests**1 50% **C** 70 – 79 %

**Final Exam2** 30% **D** 60 – 69 %

**F** < 59 %

1 *No make-up* quizzes or exams will be given.

2 **Final Exam** will be ***comprehensive*.**

**Notes:**

* Even though most of the course material is from the textbook, the lectures may or may not necessarily follow the text word-by-word. Therefore, it is the student’s responsibility to be in class and take notes. Exams will cover all material covered ***in class*** and **homework**.

**Course Objective:** With successful completion of this course, students will gain a fundamental understanding of basic engineering mechanics. The concepts and problem-solving techniques learned in this class will help form a solid foundation for all future engineering work**.**

**Course Outcome:**

• Student will learn the principles of Statics.

• Student will learn the operations associated with vectors and components of vectors.

• Student will develop an understanding of Equilibrium and the Free Body Diagram.

• Student will learn how to calculate moments associated with forces and couples.

• Student will be able to replace a system of forces with an equivalent system.

• Student will learn how to determine the centroid of an object.

• Student will be able to determine forces on structures in equilibrium composed of interconnected members.

• Student will learn how to calculate moments of inertia of area.

• Student will be able to demonstrate knowledge of distributed loads, concentrated loads and moments on structural members.

**DISCLAIMER:** Any Changes in the policy and/or schedule of this syllabus may be made at anytime during the semester at the discretion of the instructor

**Class schedule:**

*The following is a tentative schedule based upon class needs. The Instructor reserves the right to make any schedule changes necessary.*

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| --- | --- | --- | --- |
| Date | Lecture on | Homework to be finished | Quiz / Test |
| 08/27/18 | Sections 1.1 – 1.6 | Introduction |  |
| 08/29/18 | Sections 2.1 – 2.6 | Basic Vector operations, Force vectors and component | Quiz/Activity |
| 09/03/18 | College is closed |  |  |
| 09/05/18 | Sections 2.7 – 2.9 | Position Vectors, Dot product | Quiz/Activity |
| 09/10/18 | Sections 3.1 – 3.4 | Particle equilibrium | Quiz/Activity |
| 09/12/18 | Sections 3.1 – 3.4 | Particle equilibrium | Quiz/Activity |
| 09/17/18 | Sections 4.1 – 4.4 | Cross product, Moment of a force | Quiz/Activity |
| 09/19/18 | Sections 4.5 – 4.6 | Moment about an axis, couple | Quiz/Activity |
| 09/24/18 | Sections 4.7 – 4.9 | Equivalent systems, Distributed loading | Quiz/Activity |
| 09/26/18 |  | *Test#1 - Chapters 1, 2, 3, 4* | Test #1 |
| 10/01/18 | Sections 5.1 – 5.2 | 2-D Rigid Body equilibrium |  |
| 10/03/18 | Sections 5.3 – 5.4 | 2-D Rigid Body equilibrium | Quiz/Activity |
| 10/08/18 | Sections 5.5 – 5.7 | 3-D equilibrium | Quiz/Activity |
| 10/10/18 | Sections 6.1 – 6.3 | Trusses – method of Joints | Quiz/Activity |
| 10/15/18 | Section 6.4 | Trusses – method of Sections | Quiz/Activity |
| 10/17/18 | Section 6.6 | Frames & Machines | Quiz/Activity |
| 10/22/18 | Section 7.1 | Internal Forces | Quiz/Activity |
| 10/24/18 | Sections 7.2 – 7.3 | Shear and Moment equation | Quiz/Activity |
| 10/29/18 | Sections 7.2 – 7.3 | Shear & Moment Diagram |  |
| 10/31/18 | Review |  | Quiz/Activity |
| 11/05/18 |  | *Test #2 - Chapters 5, 6, 7* | Test #2 |
| 11/07/18 | Sections 8.1 – 8.2 | Dry Friction | Quiz/Activity |
| 11/12/18 | Section 9.1 | Center of Gravity | Quiz/Activity |
| 11/14/18 | Section 9.2 | Centroids of Composite bodies | Quiz/Activity |
| 11/19/18 | Sections 9.3 – 9.5 | Surface area & volume, Distributed Loading, Fluid pressure | Quiz/Activity |
| 11/26/18 | Sections 10.1 – 10.3 | Moment of Inertia, Parallel axis theorem | Quiz/Activity |
| 11/28/18 | Section 10.4 | Moment of Inertia of composite Areas | Quiz/Activity |
| 12/03/18 | Section 10.5 | Product of Inertia | Quiz/Activity |
| 12/05/18 | Review |  | Quiz/Activity |
| 12/10/18 | Final Exam will be on Chapters 5, 6, 7, 8, 9 and 10 | | |

**Important Dates:**

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**Sept. 4th Drop/Refund deadline**

**Sept. 3rd, Oct. 11th No Class**

**Nov. 21 -25th Thanksgiving break**

**Nov. 9th Withdrawal deadline for “W” Grade**

**Dec. 10th - 15th Final Exam**

**Dec. 17th Grades are due**

**Attendance:**

* Lecture attendance and punctuality are crucial factors in the learning process and successful completion of the course. Attendance will be taken at the start of every lecture.
* Students with more than 3 unexcused absences may be withdrawn from the course. Being more than 15 minutes late will count as an absence; and leaving prior to the end of class will count as an absence (unless agreed to by the instructor in advance or from an emergency).
* It is the student’s responsibility to find out what was covered in class if absent.
* **Recitation Hour attendance is MANDATORY. If you miss three sessions, you will receive an F in the class**.

**Classroom Etiquette:**

* Arrive to class on time in order to avoid being a distraction to the instructor and other students.
* Turn off all cellular phones and mobile devices before entering the classroom. Do not text in class. If an emergency arises, please leave the room quietly without disturbing other students.

**Homework:**

Assignment problems must be completed and submitted on the Mastering Engineering website which can be accessed at masteringengineering.com. You will need the code that came with your textbook or purchase a separate code from Pearson for access. The course code for this course is **EGN2312KAR** .

Assignments are normally due before the following lecture as set on the Mastering Engineering website. There is a learning curve with the website. Spend some time going to the help sections BEFORE you submit your work.

**Quizzes:**

* Quizzes are given at the beginning of class, and will generally be 15-20 minutes in duration.
* Quiz dates will be announced in advance, either in the previous class period, or on Canvas (online.valenciacollege.edu).
* There will be no make-ups for missed quizzes. The lowest quiz score may be dropped.
* Quizzes are closed book, closed notes. Can have a formula sheet.
* All work must be properly and adequately shown and organized to **earn credit**. Simply written down answers will not be given any credits and receive a grade of “0” (zero).

**Exams:**

* No make-up exams will be given for any reason. An early exam may be given with advanced notice and with instructor approval.
* Exams are closed book, closed notes. Pertinent formulas will be given.
* The final exam is required. Missing the final exam will result in a failing grade in the course per school policy.
* All work must be properly and adequately shown and organized to **earn credit**. Simply written down answers will not be given any credits and receive a grade of “0” (zero).
* There is **no** “dropped” test score
* There will be **NO CURVE** for any test or Final. **No extra credit opportunity** in this class

**Withdrawal Dates:**

If you wish to withdraw from the course, you must do so by Friday, **November 9,** 2018. It is the student’s responsibility to withdraw from the course. No “W” grades will be given after Nov. 0, 2018.

**Other Notes:**

1. The syllabus and/or course outline may be changed at any time by notice from the instructor.

2. Check your Atlas account and the Blackboard regularly for announcements from the instructor for assignment changes or any other important information.

3. Communication with the instructor is critical for any student needs throughout the term.

4. You are encouraged to ask relevant questions during class.

5. Seek help early if you are struggling with the concepts, as course content builds throughout the term.

6. Storing formulas, problems, notes, etc. in the calculator is considered cheating. The professor reserves the right to inspect the memory of the student’s calculator at any time during the semester. If inappropriate information is found stored in the calculator during a quiz/exam, the student will receive a grade of “F” for that particular quiz/exam.

7. Cheating is prohibited. If any student is caught cheating, the Instructor has the right to withdraw the student from the class and recommend expulsion from the program.

8. Classroom behavior will be governed by the “Student Code of Conduct” Policy.

9. Students with disabilities who qualify for academic accommodations must provide a letter from the Office for Students with Disabilities and discuss specific needs with the Instructor. The OSD office determines accommodations based on appropriate documentation of disabilities (SSB-102 ext. 1523).

**Student Core Competencies**

The faculty of Valencia College has identified four core competencies that define the learning outcomes for a successful Valencia graduate. These competencies are at the heart of the Valencia experience and provide the context for learning and assessment at Valencia College. You will be given opportunities to develop and practice these competencies in this class. The four competencies are:

1. **Think** - think clearly, and creatively, analyze, synthesize, integrate and evaluate in the many domains of human inquiry
2. **Value** - make reasoned judgments and responsible commitments
3. **Communicate** - communicate with different audiences using varied means
4. **Act** - act purposefully, effectively and responsibly.

**Expected Student Conduct**

Valencia Community College is dedicated not only to the advancement of knowledge and learning but is concerned with the development of responsible personal and social conduct. By enrolling at Valencia Community College, a student assumes the responsibility for becoming familiar with and abiding by the general rules of conduct. The primary responsibility for managing the classroom environment rests with the faculty. Students who engage in any prohibited or unlawful acts that result in the disruption of a class may be directed by the faculty member to leave the class. Violation of any classroom or Valencia’s rules may lead to disciplinary action up to and including expulsion from Valencia. Disciplinary action could include being withdrawn from class, disciplinary warning, probation, suspension, expulsion, or other appropriate and authorized actions. You will find the Student Code of Conduct in the current Valencia Student Handbook.

<http://catalog.valenciacollege.edu/academicpoliciesprocedures/studentcodeofconduct/>

**Students with disabilities** who qualify for academic accommodations must provide a letter from the Office for Students with Disabilities (OSD) and discuss specific needs with the professor, preferably during the first two weeks of class. The Office for Students with Disabilities determines accommodations based on appropriate documentation of disabilities (West Campus SSB 102, ext. 1523).