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## Course Outline: Engineering Mechanics (ENGR 141)

(Summer 2016)

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**Instructor:** Dr. Mohsen Akbari  
**Office Location:** EOW 331  
**Office Hours:** Open door. Best way is to email me first.  
**E-mail:** makbari@uvic.ca  
**Phone:** 250-721-6038

Lions gates  
(Vancouver BC)



**Lectures:** Mondays and Thursdays, 10:00 AM – 11:20 AM  
**Lecture Location:** Engineering Comp Science Bldg 124

**Tutorials:**

T01: Tuesdays, 11:30 AM – 12:20 AM, Hickman Building 116  
T02: Tuesdays, 11:30 AM – 12:20 AM, Engineering Comp Science Bldg 130



Space frame system

**Textbook:**

Required: RC Hibbeler, Engineering Mechanics – Statics & Dynamics, 14th Edition, Pearson, 2016.

**Course Objectives:**

ENGINEERING 141 – ENGINEERING FUNDAMENTALS I: is an introduction to mechanics. This course deals with the concept of equilibrium as applied to rigid bodies- the case in which the forces and moments acting on a body do not result in an acceleration of the body. The course will define a methodology, the method of statics, used to determine certain forces and moments acting on and within rigid bodies, and structures and machines composed of rigid components, that are in equilibrium. The most important concept that will be introduced is the free-body diagram. The objective of this course is to instill the abilities to create and interpret free body diagrams and solve complicated mechanics problems in a clear and concise manner.

Main Entry: en•gi•neer

Pronunciation: "en-ju-'nir

Etymology: alter. of earlier engineer, from Middle English, alteration of enginour, from Middle French engigneur, from Old French engignier to contrive, from engin

1: a member of a military group devoted to engineering work. 2 (obsolete) : a crafty schemer : plotter. 3 (a) : a designer or builder of engines (b) : a person who is trained in or follows as a

profession a branch of engineering (c) : a person who carries through an enterprise by skillful or artful contrivance. 4: a person who runs or supervises an engine or an apparatus.

To ensure students are fluent in the method of statics, both physical systems of units, International System (SI) and US Customary (FPS), are considered throughout the course problem sets. To define and communicate three-dimensional vector quantities, Cartesian notation is applied throughout the course.

The lectures will closely adhere to Hibbeler's textbook sections. We begin with the study of vector algebra and rigid body equilibrium and then carry these principles forward to the basic study of structures - assemblies of rigid bodies. The second half of the course starts by looking at ways of determining the internal loads in a structure or simple machine. In particular, a concise method of obtaining the internal shear and bending moment diagrams for beams is discussed thoroughly. Rounding out this course are studies of equilibrium problems involving friction and methods for locating centroids of lines, area and volumes.

### Tutorials:

- Few problems will be solved during the tutorials by your TAs.
- Attendance will be taken and will be accounted as part of your final grade of the course (see the evaluation)

### Assignments:

- There will be 10 assignment problems which will be given to you on Mondays (starting May 9th) each week. You will have one week to solve the problems.
- Assignments are worth **20% of your final grade**.
- You **SHOULD** return your assignments on the following Monday by the end of the lecture. For example, Assignment#2 will be posted online on May 16th, thus, you **MUST** submit it by the end of the lecture on May 23rd to me in the class. **No late submissions will be accepted.**
- Two random problems will be selected, graded, and feedback will be provided to you. The solutions to the assignments will be uploaded as well for your review. Each assignment will be graded out of 100% (50% for submitting the assignment and 50% for correct solutions)

### Suggested problems:

- Few suggested problems will be posted online every week for those who want to practice more.
- Solving these problems is optional but **highly recommended**.

### Pop quizzes:

- There will be 3 pop quizzes, each worth 5% of the final grade.
- The quizzes will be taken either during lectures or tutorials without previous notice.
- Quizzes will be closed-book and very similar to the assignments, suggested problems, and problems that will be solved in the tutorials.

**Tests:**

- There will be 4 tests, each worth 15% of the final grade.
- The tests will be taken during the lectures. The tentative dates are:

**Test #1:** May 19th

**Test #2:** June 2nd

**Test # 3:** June 27th

**Test #4:** July 28th

- The tests will be closed-book. I will provide you with whatever you need for the tests.
- If you miss one of these tests for medical reasons, I will consider the average of the other three tests for the missed test. Please be advised that you should provide me with an original doctors note.

**Evaluation:**

Tutorials attendance:	5%
Assignments:	20%
Pop quizzes:	15%
Test 1:	15%
Test 2:	15%
Test 3:	15%
Test 4:	15%
<b>Total:</b>	<b>100%</b>