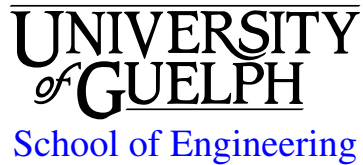


ENGG\*1210 Engineering Mechanics  
Winter 2014



(Revision 0: November 28, 2013)

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## 1 INSTRUCTIONAL SUPPORT

### 1.1 Instructor

Instructor: Graham Taylor, Ph.D.  
Office: THRN 2413  
Email: [gtaylor@uoguelph.ca](mailto:gtaylor@uoguelph.ca)  
Office hours: Monday 15:00 - 16:00

### 1.2 Teaching Assistants

GTA	Email	Office Hours
Some Body	<a href="mailto:sbody@uoguelph.ca">sbody@uoguelph.ca</a>	TBA on Courselink
Someone Else	<a href="mailto:selse@uoguelph.ca">selse@uoguelph.ca</a>	TBA on Courselink

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## 2 LEARNING RESOURCES

### 2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the ENGG\*1210 [Courselink](#) site. You are responsible for checking the site regularly.

### 2.2 Required Resources

1. Russell C. Hibbeler, *Engineering Mechanics: Statics & Dynamics*, 13<sup>th</sup> edition, Prentice Hall, 2012.

## 2.3 Additional Resources

**Lecture Information:** Notes to accompany lectures will be posted on the course website (CourseLink) throughout the semester. You will be granted access to the website when you register for the course. These lecture notes are not complete and it is still highly recommended that you print the notes prior to lectures and fill in the blank sections.

**Assignments:** Download the assignments according to the schedule given in this handout. All the solutions will be posted as indicated.

**Exams:** Some midterms and finals of previous years are posted as samples of exams. The solutions are also posted for your convenience.

**Miscellaneous Information:** Other information related to Engineering Mechanics will be posted on the course website.

## 2.4 Communication and Email Policy

Please use lectures and tutorials as your main opportunity to ask questions about the course. Major announcements and/or changes will be posted to the course website. **It is your responsibility to check the course website regularly.**

Electronic communication should be limited to the course forum, however topics of a personal and confidential nature (e.g. marks) should be emailed to the instructor: [gwtaylor@uoguelph.ca](mailto:gwtaylor@uoguelph.ca). Please note that **all email communication must be made through your University of Guelph email account** (i.e. *username@uoguelph.ca*).

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# 3 ASSESSMENT

## 3.1 Dates and Distribution

**Assignments:** (10, unmarked) 0%

Week of January 6  
Week of January 13  
Week of January 20  
Week of January 27  
Week of February 3  
Week of February 10  
Week of February 24  
Week of March 3  
Week of March 10  
Week of March 17

**In-tutorial Quizzes:** (8, best 7) 15%

Week of January 13  
Week of January 20

Week of January 27  
Week of February 3  
Week of February 24  
Week of March 3  
Week of March 10  
Week of March 17

**In-class Tests:** 15%

Test 1: Tuesday January 28, Room TBA on Courselink  
Test 2: Thursday, March 20, Room TBA on Courselink

**In-class Midterm:** 30%

Thursday February 13, Room TBA on Courselink

**Final Exam:** 40%

Saturday April 12, 08:30-10:30, Room TBA on Webadvisor

### 3.2 Course Grading Policies

**Missed Assessments:** If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please email the course instructor. See the undergraduate calendar for information on regulations and procedures for Academic Consideration:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

**Accommodation of Religious Obligations:** If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Consideration of Religious Obligations:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml>

**Passing grade:** The passing grade is 50%.

**Missed midterm tests:** If you miss a quiz, test, or midterm due to grounds for granting academic consideration or religious accommodation, the weight of any missed assessment will be added to the final exam weight. There will be no makeup quizzes, tests, or midterm.

**Lab Work:** You must attend and complete all laboratories. If you miss a laboratory due to grounds for granting academic consideration or religious accommodation, arrangements must be made with the teaching assistant to complete a makeup lab.

**Late Lab Reports:** Late submissions of lab reports will not be accepted.

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## 4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

### 4.1 Calendar Description

The fundamental principles of Newtonian mechanics; statics of particles in 2-D space; equilibrium of rigid bodies in 2-D; distributed forces; friction, linear and angular momentum of rigid bodies; conservation of energy; principles of impulse and momentum; and, plane motion of rigid bodies.

### 4.2 Course Aims

This course is to introduce the basic principles of engineering mechanics with emphasis on their analysis and application to practical engineering problems.

This course will focus on the most basic branch of mechanics: rigid-body mechanics. It is essential for the design and analysis of many types of structural members, mechanical components, or electrical devices encountered in engineering. It also forms the basis for future studies in mechanics, including deformable-body mechanics and fluid mechanics. Hopefully, by the end of the semester, you will have a better understanding of what mechanics means, and how this branch of science is useful for engineers.

### 4.3 Learning Objectives

At the successful completion of this course, the student will have demonstrated the ability to:

1. Solve for the resultants of any force systems;
2. Determine equivalent force systems;
3. Determine the internal forces in plane frames, simple span trusses and beams;
4. Solve the mechanics problems associated with friction forces;
5. Obtain the centroid, first moment and second moment of an area;
6. Describe the motion of a particle in terms of its position, velocity and acceleration in different frames of reference;
7. Analyze the forces causing the motion of a particle;
8. Use the equation of motion to describe the accelerated motion of a particle;
9. Apply work, energy, impulse and momentum relationships for a particle in motion;
10. Describe the motion of a rigid body in different frames of reference.

### 4.4 Graduate Attributes

Successfully completing this course will contribute to the following CEAB Graduate Attributes:

<b>Graduate Attribute</b>	<b>Learning Objectives</b>	<b>Assessment</b>
1. Knowledge Base for Engineering	1, 5, 6, 9, 10	Quizzes, Tests, Exams
2. Problem Analysis	2, 3, 4, 7, 8	Quizzes, Tests, Exams
3. Investigation	-	-
4. Design	-	-
5. Use of Engineering Tools	-	-
6. Communication	-	-
7. Individual and Teamwork	-	-
8. Professionalism	-	-
9. Impact of Engineering on Society and the Environment	-	-
10. Ethics and Equity	-	-
11. Environment, Society, Business, & Project Management	-	-
12. Life-Long Learning	-	-

#### **4.5 Instructor's Role and Responsibility to Students**

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courselink/D2L but these are not intended to be stand-alone course notes. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for tests and project.

#### **4.6 Students' Learning Responsibilities**

Students are expected to take advantage of the learning opportunities provided during lectures and tutorials. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

#### **4.7 Relationships with other Courses & Labs**

##### **Previous and/or Current Courses:**

**MATH\*1200 & MATH\*1210:** Differentiation, integration

##### **Follow-on Courses:**

**ENGG\*2230:** Fluid Mechanics

**ENGG\*2340:** Kinematics and Dynamics

**ENGG\*2400:** Modeling and simulation of mechanical systems

**ENGG\*3150:** Engineering Biomechanics properties

## 5 TEACHING AND LEARNING ACTIVITIES

### 5.1 Timetable

**Lectures:**

Tuesday	10:00 - 11:20	MACN 105
Thursday	10:00 - 11:20	MACN 105

**Tutorials:**

Wednesday	Sec 01	13:30 - 14:20	ROZH 109
Monday	Sec 02	10:30 - 11:20	ROZH 108
Monday	Sec 04	13:30 - 14:20	ROZH 108
Monday	Sec 05	12:30 - 13:20	ROZH 109
Monday	Sec 06	12:30 - 13:20	ROZH 108
Monday	Sec 07	10:30 - 11:20	ROZH 107
Wednesday	Sec 08	10:30 - 11:20	ROZH 108
Monday	Sec 09	09:30 - 10:20	ROZH 107

### 5.2 Lecture Schedule

Lectures	Lecture Topics	References	Learning Objectives
1	Introduction to Engineering Mechanics	Chapter 1	-
2-3	Force Vectors	Chapter 2	1
4	Equilibrium of a Particle	Chapter 3	1,2
5-6	Rigid Body Force Systems	Chapter 4	1,2
7	Equilibrium of a Rigid Body	Chapter 5	1,2
8-9	First Moments & Centroids	Chapter 9	5
10-11	Analysis of Structures	Chapter 6	3
12	Forces in Beams	Chapter 7	3
13	Friction	Chapter 8	4
14-15	Particle Kinematics	Chapter 12	6
16	Kinetics of a Particle: Force & Acceleration	Chapter 13	7
17-18	Kinetics of a Particle: Work & Energy	Chapter 14	9
19-20	Kinetics of a Particle: Impulse & Momentum	Chapter 15	9
21	Planar Kinematics of a Rigid Body	Chapter 16	10

### 5.3 Other Important Dates

Monday, January 6 2014: First day of class

Monday, February 17 - Friday, February 21 2014: Winter Break

Friday, March 7: drop date - 40th class  
Friday, April 4 2014: last day of class

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## 6 ACADEMIC MISCONDUCT

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

### 6.1 Resources

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:  
<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:  
<http://www.academicintegrity.uoguelph.ca/>

Please also review the section on Academic Misconduct in your [Engineering Program Guide](#).

The School of Engineering has adopted a Code of Ethics that can be found at:  
<http://www.uoguelph.ca/engineering/undergrad-counselling-ethics>

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## 7 ACCESSIBILITY

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability for a short-term disability should contact the Centre for Students with Disabilities as soon as possible

For more information, contact CSD at 519-824-4120 ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or see the website: <http://www.uoguelph.ca/csd/>

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## 8 RECORDING OF MATERIALS

Presentations which are made in relation to course work-including lectures-cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

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## 9 RESOURCES

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:

<http://www.uoguelph.ca/registrar/calendars/index.cfm?index>