ENGG*1210 Engineering Mechanics
Fall 2013

School of Engineering

(Revision 0: September 5, 2013)

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1 Instructional Support

1.1 Instructor

Instructor: Jonathan VanderSteen, Ph.D., P.Eng.
Office: THRN 2333, ext. 52040
Email: vandersj@uoguelph.ca
Office hours: Monday 5:30-6:30 (THRN 1425) or by appointment

1.2 Teaching Assistants

GTA	Email	Office Hours	Assignment
Larry Chen	lchen06@uoguelph.ca	Wed 2-3, THRN 1425	Seminar 05 and 07
Jamie Miller	jmille11@uoguelph.ca	TBA on Courselink	Lead TA
Emmanuel Ogunsona	eogunson@uoguelph.ca	Fri 8:30-9:30, THRN 1425	Seminar 02 and 04
Subhash Paul	subhash@uoguelph.ca	Wed 4-5, THRN 1425	Seminar 01 and 03
Qirui Sun	qsun01@uoguelph.ca	TBA on Courselink	Seminar 06 and 08

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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: http://courselink.uoguelph.ca. You are responsible for checking the site regularly.

2.2 Required Resources

1. R.C. Hibbeler *Engineering Mechanics: Statics & Dynamics* 13th Edition Pearson, 2013

2.3 Recommended Resources: Engineering Peer Helpers (Voluntary)

The peer helper program, staffed by upper year engineering students, offers regular workshops aimed at developing problem solving skills and new learning tools specific to core engineering courses such as Engineering Mechanics. Your peer helpers for Mechanics are Michael Mohan and Geneva Starr.

The Engineering Mechanics Focused Engineering Problem Solving (FEPS) sessions will be run in THRN 1427 every week on Mondays (5:30-6:30) and Wednesdays (1:30-2:30 and 5:30-6:30).

Contact engpeers@uoguelph.ca or http://www.uoguelph.ca/engineering/peer_helper for more information.

2.4 Additional Resources

Lecture Information: Notes to accompany lectures will be posted on the course website (Courselink) throughout the semester.

Seminar: There will be 1 hour of tutorials every week

Assignments: There will be approximately 10 assignments posted in Courselink during the term. These assignments are not marked, but it is recommended that you do each assignment, as practice problems are the best way to learn the course. In addition, in-tutorial quizzes will be based closely on assignments. All the solutions will be posted.

Miscellaneous Information: Other information related to Engineering Mechanics is also posted on the web page.

2.5 Communication and Email Policy

Please use lectures and tutorial sessions as your main opportunity to ask questions about the course. Electronic communication should be limited to the course forum, however, topics of a personal and confidential nature should be emailed to the instructor. Please note that all email communication must be made through your university email account (<username>@uoguelph.ca).

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3 ASSESSMENT

3.1 Dates and Distribution

Assignments: 0% (Approximately 10 assignments)

Quizzes*: 15% (In-seminar, best 6 out of 7)
See Section 5.3 below for quiz dates. Quizzes must be written in assigned seminar.

Tests*: 15% (In-class, 2 tests)
Tuesday, Oct 1 and Tuesday, Nov 12.

Midterm*: 30% (Closed book, Covers material up to last lecture prior to exam)
Thursday, Oct 17, In-class.

Final Exam*: 40% (Closed book, Covers entire course)
Monday, Dec 2, 7:00-9:00 pm, Room TBA

*All exams, tests, and quizzes will be closed book tests. Necessary equations and information will be provided or announced prior to each exam. Calculators are permitted, but must be non-communicating devices.

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 Accommodation of Religious Obligations: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Mark Adjustments: If you have questions about any grade, please inquire within one week of the mark being received. Re-marking requests will not be honoured more than one week after the document has been returned.

Passing Grade: In order to pass the course, you must obtain a final grade of 50% or higher.

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

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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

Engineers must understand how forces impact the objects to which they are applied and in turn how to design structural, mechanical, or even electrical components. This course is to introduce the basic

principals of engineering statics and dynamics with an emphasis on the analysis and application to practical engineering problems. The main goals of the course are (1) to teach students the fundamental concepts in classical engineering mechanics and (2) to prepare the students for intermediate and advanced engineering courses that build on mechanics.

4.3 Learning Objectives

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

1. Clearly articulate and differentiate the main concepts of Newtonian mechanics including forces, moments, distributed forces, linear and angular momentum, impulse, energy, and equilibrium
2. Clearly communicate engineering calculations with correct accuracy, precision, significant digits, and dimensional homogeneity
3. Solve for the resultants of any force system; determine equivalent force systems
4. Prepare clear and logical free body diagrams
5. Determine the internal forces in plane frames, simple span trusses and beams
6. Solve the mechanics problems associated with friction forces
7. Obtain the centroid, first moment, and second moment of an area
8. Describe the motion of a particle in terms of its position, velocity, and acceleration in different frames of reference
9. Analyze the forces causing the motion of a particle
10. Use the equation of motion to describe the accelerated motion of a particle
11. Apply work, energy, impulse, and momentum relationships for a particle in motion
12. Describe the motion of a rigid body in different frames of reference
13. Demonstrate knowledge of technical problem solving skills

4.4 Graduate Attributes

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

Graduate Attribute	Learning Objectives	Assessment
1. Knowledge Base for Engineering	1 – 13	Quizzes, Exams, Tests
2. Problem Analysis	1, 2, 4	Quizzes, Exams, Tests
3. Investigation	13	Quizzes, Exams, Tests
4. Design	-	-
5. Use of Engineering Tools	13	-
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.

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 Courses:

No prerequisites to this course

Follow-on Courses:

ENGG*1500: Solving systems of linear equations

CHEM*1040: Chemical and material properties

PHYS*1130: Force, motion, and momentum

ENGG*2160: Mechanics of deformable solids

ENGG*2400: Engineering systems analysis in general – deeper understanding of force, deflection, energy, and work

ENGG*2230: Mechanics of gases and fluid, material that cannot take a shear stress

ENGG*2340: Three-dimensional analysis of forces and motion

ENGG*3280: Applications of engineering mechanics in the design of mechanical elements

5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable

Lectures:

Tuesday		11:30 – 12:50	THRN 1200	
Thursday		11:30 – 12:50	THRN 1200	
Seminars:				
Wednesday	Sec 01	9:30 – 10:20	CRSC 403	Subhash
Friday	Sec 02	9:30 – 10:20	MACK 307	Emmanuel
Wednesday	Sec 03	12:30 – 1:20	MACK 309	Subhash
Friday	Sec 04	12:30 – 1:20	MACK 312	Emmanuel
Tuesday	Sec 05	1:30 – 2:20	MACK 315	Larry
Thursday	Sec 06	1:30 – 2:20	MACK 311	Qirui
Tuesday	Sec 07	2:30 – 3:20	MACK 315	Larry
Thursday	Sec 08	2:30 – 3:20	CRSC 403	Qirui

Students are responsible for all information presented in the class and seminars, and student participation is highly encouraged. The dynamics of each learning activity should be based on professionalism and mutual respect. Cell phones are to be turned off during the class, ear buds must be put away, and the use of laptops and tablets in class is restricted to taking class notes.

Everyone in the classroom has the right to participate and contribute. If there is anything that may prevent your full contribution, let the instructor know as soon as possible. The learning environment must be free from harassment.

5.2 Lecture Schedule and Details

Week	Lecture Topics	References	Learning Objectives
1	Introduction	Chapter 1	2, 13
1-2	Force Vectors	Chapter 2	3
2	Particle Equilibrium	Chapter 3	3
3	Rigid Body Force Systems	Chapter 4	3, 4
4	Rigid Body Equilibrium	Chapter 5	3, 4
4-5	Analysis of Structures	Chapter 6	5
5-6	Forces in Beams	Chapter 7	5
6	Friction	Chapter 8	6
7	First Moments and Centroids	Chapter 9	7
8	Moments of Inertia	Chapter 10	7
8-9	Particle Kinematics	Chapter 12	8
9	Force & Acceleration of a Particle	Chapter 13	9, 10
10	Particle Work & Energy	Chapter 14	11

11	Particle Impulse and Momentum	Chapter 15	11
12	Kinematics of a Rigid Body	Chapter 16	12

5.3 Seminar Schedule and Details

The seminar will cover background material and problem sets not covered in lectures. In each seminar, the GTA will present concepts and tips related to the week's material and the course assignments. In 7 of the seminars, there will be an in-tutorial quiz that will be based on past assignment questions. It is essential that you attend your scheduled seminar.

Week	Topic
1 (Sept 9-13)	Seminar – Introduction
2 (Sept 16-20)	Quiz 1 (Assignment 1)
3 (Sept 23-27)	Quiz 2 (Assignment 2)
4 (Sept 30- Oct 4)	Seminar – Force Systems
5 (Oct 7-11)	Quiz 3 (Assignment 3 and 4)
6 (Oct 15-18)	Seminar – Structure Analysis
7 (Oct 21-25)	Quiz 4 (Assignment 5 and 6)
8 (Oct 28- Nov 1)	Quiz 5 (Assignment 7)
9 (Nov 4-8)	Quiz 6 (Assignment 8)
10 (Nov 11-15)	Seminar – Kinematics
11 (Nov 18-22)	Quiz 7 (Assignment 9 and 10)
12 (Nov 25-28)	No Seminar – Study for Final Exam

5.4 Other Important Dates

October 31 is the 40th day of class – the last day to drop a class.

6 LAB SAFETY

6.1 SOE Statement

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.

6.2 Engineering Mechanics I Lab

There is no lab component to this course.

7 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.

7.1 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

8 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.caor see the website: http://www.csd.uoguelph.ca/csd/