



ENGG*1210 Engineering Mechanics I

Winter 2018

Section(s): C01

School of Engineering

Credit Weight: 0.50

Version 1.00 - January 04, 2018

1 Course Details

1.1 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.

1.2 Course Description

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

1.3 Timetable

Section	Lecture Time	Lecture Location
1	Tue./Thu. 02:30PM - 03:50PM	LA, Room 204
2	Tue./Thu. 10:00AM - 11:20AM	MCLN, Room 102

Section	Tutorial Time	Tutorial Location
101	Fri. 02:30PM - 03:20PM	MCKN, Room 305
102	Thu. 01:30PM - 02:20PM	MINS, Room 037
103	Wed. 08:30AM - 09:20AM	MINS, Room 037
104	Fri. 08:30AM - 09:20AM	MINS, Room 037
105	Mon. 08:30AM - 09:20AM	MCKN, Room 315
106	Thu. 08:30AM - 09:20AM	MINS, Room 037
107	Fri. 12:30PM - 01:20PM	MCKN, Room 306
108	Tue. 08:30AM - 09:20AM	MINS, Room 037
109	Mon. 02:30PM - 03:20PM	MINS, Room 037

201	Fri. 02:30PM - 03:20PM	MCKN, Room 305
202	Thu. 01:30PM - 02:20PM	MINS, Room 037
203	Wed. 08:30AM - 09:20AM	MINS, Room 037
204	Fri. 08:30AM - 09:20AM	MINS, Room 037
205	Mon. 08:30AM - 09:20AM	MCKN, Room 315
206	Thu. 08:30AM - 09:20AM	MINS, Room 037
207	Fri. 12:30PM - 01:20PM	MCKN, Room 306
208	Tue. 08:30AM - 09:20AM	MINS, Room 037
209	Mon. 02:30PM - 03:20PM	MINS, Room 037

1.4 Final Exam

11:30AM - 01:30PM (2018/04/20), Room TBA Room TBA

2 Instructional Support

2.1 Instructor(s)

Amir Aliabadi Ph.D., P.Eng.

Email: aaliabad@uoguelph.ca
Telephone: +1-519-824-4120 x.54862
Office: RICH 2515
Office Hours: To Be Determined In Class (TBDIC)
<http://www.aaa-scientistis.com>

Prasad Daggupati Ph.D.

Email: pdaggupa@uoguelph.ca
Telephone: +1-519-824-4120 x.58303
Office: RICH 3523
Office Hours: To Be Determined In Class (TBDIC)
<http://www.uoguelph.ca/~pdaggupa>

2.2 Teaching Assistant(s)

Teaching Assistant: Amin Azarkhish
Email: aazarkhi@uoguelph.ca
Office Hours: TBDIC

Teaching Assistant: Osama Elbanhawy
Email: oelbanha@uoguelph.ca
Office Hours: TBDIC

Teaching Assistant: Taylor Livingston
Email: tlivin04@uoguelph.ca
Office Hours: TBDIC

Teaching Assistant: Mohsen Moradi
Email: moradim@uoguelph.ca
Office Hours: TBDIC

Teaching Assistant: Mei Xiao
Email: mxiao01@uoguelph.ca
Office Hours: TBDIC

Teaching Assistant: Josephine Yee
Email: jyee02@uoguelph.ca
Office Hours: TBDIC

3 Learning Resources

3.1 Required Resources(s)

CourseLink (Website)

<https://courselink.uoguelph.ca>

Course material, news, announcements, and grades will be regularly posted to the ENGG*1210 CourseLink site. You are responsible for checking the site regularly.

Engineering Mechanics: Statics & Dynamics, 14th edition (Textbook)

Russell C. Hibbeler. 2016, Prentice Hall

3.2 Additional Resources(s)

Lecture Material (Notes)

Students are required to download and print lecture material according to the schedule given in this outline from CourseLink before every lecture and bring to class.

Assignments (Other)

Students are required to download and print the assignments according to the schedule given in this outline from CourseLink **before** every tutorial and bring to tutorial. Students are expected to try these assignment **before** they are attempted in the tutorials. All the solutions will be posted as indicated.

Review Problems (Other)

Students are required to download and print the review problems according to the schedule given in this outline. These review problems may be attempted in tutorials. Students are expected to try these review problems **before** they are attempted in the tutorials. All the solutions will be posted as indicated.

Miscellaneous Information (Other)

Other information related to Engineering Mechanics will be posted on the course website.

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Describe the motions and forces associated with the static and dynamic behaviour of point objects and rigid bodies.
2. Clearly articulate and differentiate the main concepts of Newtonian mechanics including forces, moments, distributed forces, friction, linear and angular momentum, impulse, energy, power, efficiency and equilibrium.

3. Model and solve engineering mechanics problems with stated assumptions, using clearly communicated solutions complete with Free Body Diagrams, dimensional homogeneity, and correct use of significant digits.
4. Describe the force and moment distribution throughout structures and mechanisms.
5. Describe the motion of a particle or rigid body in terms of its position, velocity, and acceleration in different frames of reference.

4.2 Engineers Canada - Graduate Attributes

Successfully completing this course will contribute to the following:

#	Outcome Set Name	Course Learning Outcome
1	Knowledge base	1, 2, 3
1.1	Recall, describe and apply fundamental mathematical principles and concepts	1, 2, 3
1.2	Recall, describe and apply fundamental concepts and principles in natural sciences	1, 2, 3
1.3	Comprehend and apply fundamental engineering concepts	1, 2, 3
1.4	Comprehend and apply program-specific engineering concepts	1, 2, 3
2	Problem analysis	4
2.1	Formulate a problem statement in engineering and nonengineering terminology	4
2.2	Construct a conceptual framework	4
2.3	Identify, organize and justify appropriate information	4
2.4	Execute an engineering solution	4
2.5	Critique and appraise results	4

5 Teaching and Learning Activities

5.1 Lecture

Topic(s): Introduction, Force Vectors

Reference(s): Ch. 1,2

Topic(s): Equilibrium of a Particle

Reference(s): Ch. 3

Topic(s): Rigid Body Force Systems

Reference(s): Ch. 4

Topic(s): Equilibrium of a Rigid Body

Reference(s): Ch. 5

Topic(s):	Analysis of Structures
Reference(s):	Ch. 6
Topic(s):	Forces in Beams
Reference(s):	Ch. 7
Topic(s):	Friction
Reference(s):	Ch. 8
Topic(s):	First Moments & Centroids
Reference(s):	Ch. 9
Topic(s):	Particle Kinematics
Reference(s):	Ch. 12
Topic(s):	Kinetics of a Particle: Force & Acceleration
Reference(s):	Ch. 13
Topic(s):	Kinetics of a Particle: Work & Energy
Reference(s):	Ch. 14
Topic(s):	Kinetics of a Particle: Impulse & Momentum
Reference(s):	Ch. 15
Topic(s):	Course Review

5.2 5.3 Important Dates (Undergraduate Calendar)

Mon. Dec. 11: Add period for Winter semester 2018 begins
 Mon. Jan. 8: Classes commence
 Fri. Jan. 12: Add period ends
 Thu. Feb. 8: Term test 1
 Mon. Feb. 19: Winter break begins - no classes this week
 Mon. Feb. 26: Classes resume
 Fri. Mar. 9: 40th class day, last day to drop one semester course
 Thu. Mar. 15: Term test 2
 Fri. Apr. 6: Classes conclude
 Fri. Apr. 20: Final Exam

6 Assessments

6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Assignments	0.00
In-tutorial Quizzes	20.00
Test 1 & 2	40.00
Final Exam	40.00
Total	100.00

6.2 Assessment Details

Assignments (0.00%)

Date: All Weeks

In-tutorial Quizzes (20.00%)

Date: Weeks of: Jan. 15, 29, Feb. 12, Mar. 5, 19.

Test 1 (20.00%)

Date: Thu, Feb 8, In Class

Test 2 (20.00%)

Date: Thu, Mar 15, In Class

Final Exam (40.00%)

Date: Fri, Apr 20, TBD

Details will be posted on Webadvisor

7 Course Statements

7.1 Communication & 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 if they are not of personal nature. If such matters are communicated by email, they may not be answered. Electronic communication can take place using email if they are of personal nature (e.g. remarking, accommodations, considerations, complaints, etc.).

All marking and problem solving questions should first be directed to GTAs as the point of contact. If the matter is not resolved or a meeting time between student and GTA cannot be agreed upon mutually, then the matter can be directed to the instructors:

aliabadi@uoguelph.ca, pdaggupa@uoguelph.ca. Topics of a personal and confidential nature, such as special accommodations and considerations, should be emailed to the instructors. Please note that **all email communication must be made through your University of Guelph email account** (i.e. *user-name@mail.uoguelph.ca*).

7.2 Course Grading Policies

Academic Consideration: 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 Quizzes and Term Tests: If you miss a quiz or term test due to grounds for granting academic consideration or religious accommodation, the weight of any missed assessment will be added to the final exam weight. If you miss two or more quizzes due to grounds for granting academic consideration or religious accommodation, the weight of the second and higher missed quizzes will be added to the final exam weight. There will be no makeup quizzes or tests.

Questions Concerning Grades: All requests for re-marking must be made to the person who marked the quiz or test and **accompanied by a completed re-marking request form** (found on CourseLink). Any item that is re-marked will be re-marked entirely. Therefore, it is strongly suggested that you thoroughly review your entire document **before** making a re-marking request. Pencil-written works will not be re-marked. Re-marking requests will not be honoured more than one week after the document has been returned.

7.3 Relationships with other Courses & Labs

Previous and/or Current Courses:

MATH*1200 & MATH*1210: Differentiation, integration

Follow-on Courses:

ENGG*2160: Mechanics of deformable solids

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

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

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

ENGG*3150: Engineering Biomechanics properties

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

8 School of Engineering Statements

8.1 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 but these are not intended to be stand-alone course notes. Some written lecture notes will be presented only in class. 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 labs.

8.2 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and lab sessions. 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.

8.3 Lab Safety

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.

9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The regulations and procedures for [Academic Consideration](#) are detailed in the Undergraduate Calendar.

9.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for [Dropping Courses](#) are available in the Undergraduate Calendar.

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their

academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas

9.6 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 or faculty advisor.

The [Academic Misconduct Policy](#) is detailed in the Undergraduate Calendar.

9.7 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, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 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.

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