

# ENGG\*2180 Introduction to Manufacturing Processes W (3-2)

[0.5]

Winter 2016



[School of Engineering](#)

(Revision 0: December 25, 2015)

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## 1 INSTRUCTIONAL SUPPORT

### 1.1 Instructor

Instructor: Dr. Ibrahim Deiab, Ph.D., P.Eng.

Office: THRN 2415, ext. 58391

Email: [ideiab@uoguelph.ca](mailto:ideiab@uoguelph.ca)

Office hours: Tuesday and Thursday 10:15 – 11:00, Wednesday 9 -10:30, via email or by appointment

### 1.2 Lab Technician

Technician: **Mr. Barry Verspagen**

Office: THRN 1138, ext. 58821

Email: [baverspa@uoguelph.ca](mailto:baverspa@uoguelph.ca)

Technician: **Mr. Dave Wright**

Office: THRN 1025, ext. 56706

Email: [dwrigh02@uoguelph.ca](mailto:dwrigh02@uoguelph.ca)

Technician: **Mr. Ken Graham**

Office: THRN 1025, ext. 53924

Email: [kgraha06@uoguelph.ca](mailto:kgraha06@uoguelph.ca)

### 1.3 Teaching Assistants

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Mr. Abedlkrem Eltaggaz [aeltagga@uoguelph.ca](mailto:aeltagga@uoguelph.ca)

**[Check course link for TA office hours and location](#)**

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## 2 LEARNING RESOURCES

### 2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the ENGG\*2180 Courselink site. You are responsible for checking the site regularly. Also a facebook page was created and will be used during the course (<https://www.facebook.com/ENGG2180/>) please add yourself ....

### 2.2 Required Resources

1. M Mikell P. Groover, Fundamentals of Modern manufacturing, 6<sup>th</sup> edition ,Wiley, 2015.
2. Handouts, Check Courselink regularly.

### 2.3 Recommended Resources

### 2.4 Additional Resources

**Lecture Information:** All the lecture notes will be posted on the web page.

**Please note that power point presentations are not comprehensive of all materials covered.**

**Lab Information:** The handouts for all the lab sessions are within the lab section. All types of resources regarding tutorials, links to web pages can be found in this section.

**Assignments:** Assignments handouts and due dates will be posted on Courselink

#### **Tentative Out-of-class Assignments:**

HW # 1	Casting
HW # 2	Metal forming
HW # 3-5	Metal cutting
HW # 6	Non-conventional machining and Welding
HW # 7	Statistical quality control
Project	Due and presented in the last lab session as will be posted on Courselink

**Exams:** see section 3. The instructor reserve all the rights on setting exam rules, allowed materials and use of calculators, seating of students, allowing electronic devices, e.g smart phones. It is the

students responsibly to strictly follow instructor instructions. If a student fails to follow instructions he will be asked to leave the exam hall and get a zero with no makeup option.

**Sharing of calculators, formula sheets, if applicable, or use of smart phones as calculators is not allowed.**

#### Miscellaneous Information:

### 2.5 Communication & Email Policy

Please use lectures and lab help sessions as your main opportunity to ask questions about the course. Major announcements will be posted to the course website. **It is your responsibility to check the course website regularly.** As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

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## 3 ASSESSMENT

### 3.1 Dates and Distribution\*

**Quizzes:** (10%) Thursday Jan 21, Feb 4, March 10, March 17, April 5th

**Home works:** (5%) assignments problems will be posted on Courselink, Homework grade is based on attempting all assigned problems and grade may be assigned based on the grading of a randomly selected problem.

**Labs and project:** (20%) See section 5.3

**Midterm Exam(s):** 30% (15% each)  
Thursday Feb. 25 2016 and Thursday March 24 2016

**Please note:** the instructor will form project and lab groups, as much as possible students' preferences will be entertained.

**Final EXAM (35%) Thursday April 21st 2015 07:00PM - 09:00PM Room TBA.**

**Final exam date and time is set by registrar office, in case of discrepancy the registrar set date and time supersedes this course outline**

**The instructor, at his discretion, may entertain requests by the class to adjust assessment dates, except final exam, with the unanimous consent of the class.**

### 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 at 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>

**Passing grade:** In order to pass the course, Student must obtain a grade of 50% or higher on the exam portion (final exam and midterms) of the course in order for the laboratory write-up portion of the course to count towards the final grade. If you fail the exam portion your final grade will be 45% or less.

**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 and/or other exams at the discretion of the instructor. There will be no makeup midterm tests or exams.

**Lab Work:** You must attend and complete all laboratories no make up for missed labs. If you are to miss a laboratory due to grounds for granting academic consideration, or if you are to miss a lab for religious accommodation, arrangements must be made with the teaching assistant apriori.

**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: This course is designed to provide students with an overview of a wide variety of manufacturing processes involved in industrial activities. While most of the manufacturing processes are to be introduced during the course, more emphasis will be given on those processes which are more common in industry, namely material removal processes, casting, and forming. In addition to introducing the various manufacturing process, mathematical models and several empirical data and equations describing the various manufacturing will be covered in order to provide the students with a better understanding of the relations between the parameters involved.

Prerequisite(s): ENGG\*2160,

Co-requisite(s): ENGG\*2120,

### 4.2 Course Aims

This course is designed to help the student:

- Understand the engineering aspects of manufacturing processes.
- Discuss the effects of different manufacturing processes on the performance of manufactured items.
- Foster an appreciation for the roles of manufacturing in modern society by discussing real-life applications.

- Develop basic understanding and as well as tools for selecting manufacturing processes for given applications and designs.

#### Learning Objectives

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

1. Select an effective method and perform necessary calculations to solve the problem
  - a) Select manufacturing processes.
  - b) Select and calculate metal-casting processes parameters and describe equipment.
  - c) Select and calculate metal forming processes parameters and describe related equipment.
  - d) Select and analyze material-removal processes.
  - e) Describe the joining processes.
2. Awareness of the impact of engineering solutions on safety and the environment
  - a) Evaluate the basics of economics of metal cutting
  - b) Identify the non-traditional machining processes.
3. Awareness of government regulations and professional standards
  - c) Demonstrate familiarity with statistical quality control

### 4.3 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, 2,	Quizzes, Exams
2. Problem Analysis	-	Quizzes, Exams,
3. Investigation	3, 4, 5	Labs, Project
4. Design	1,2,3	Project
5. Use of Engineering Tools	1,2,3	Labs, Project
6. Communication	1,2,3	Labs, Project
7. Individual and Teamwork	-	Labs
8. Professionalism	-	-
9. Impact of Engineering on Society and the Environment	3,	Labs, Project
10. Ethics and Equity	-	-
11. Environment, Society, Business, & Project Management	3,	Labs, Project
12. Life-Long Learning		-

### 4.4 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.

#### **4.5 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.

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

**Previous Courses:**

**Follow-on Courses:**

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## 5 TEACHING AND LEARNING ACTIVITIES

### 5.1 Timetable

**Lectures:** MACN Room 105 Tuesday and Thursday 08:30– 09:50

**Laboratory:** **check your lab section. *You are only allowed to attend the section you are registered in, Thrn 1009 and 1015***

Monday 11:30AM – 13:20 & 13:30- 16:20

Wednesday 9:30AM - 11:20 & 11:30 - 13:20, & 16:30- 17:20

Friday 11:30AM - 13:20& 16:30- 17:20

### 5.2 Lecture Schedule\*

Weeks	Lecture Topics	References	Learning Objectives
0.5	Introduction to Manufacturing	Chapter 1	1,2,3
2.5	Metal-casting processes	Chapter 10,11	1,2,3
1	Metal forming	Chapter 17-19	1,2,3
1.5	Theory of metal cutting	Chapter 20	1,2,3
1	Machining operations and machine tools	Chapter 21-22	1,2,3
1	Economics of metal cutting	Chapter 23	1,2,3
1	Non-conventional machining processes	Chapter 25	1,2,3
1	Joining processes	Chapter 28-30	1,2,3
1	Quality control	Chapter 40	1,2,3
1.5	Review and Evaluation		

\*Tentative, length of coverage and order of topics may be changed, Check course link for covered chapters and sections of each chapter.

### 5.3 Lab Schedule

Week	Topic*	Due
1	Introduction to Lab Equipment and Safety Training	

Lab sessions will be designed to cover topics needed for the students' project. It may include tutorials on software and use of different pieces of equipment related to the course. Experiments will be presented as mini projects where students work on designing and conducting the experiments. Labs are used for group meetings and meeting with instructor and GTA

#### 5.4 Other Important Dates

Important dates can be found here:

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c03/c03-wintersem.shtml>.

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## 6 LAB SAFETY

There is zero tolerance for violating lab safety rules.

Please refer to Safety information tab on ENGG2180 course link page.

For casting experiment review also ASTM E2349 - 12

(Standard Practice for Safety Requirements in Metal Casting Operations: Sand Preparation, Molding, and Core Making; Melting and Pouring; and Cleaning and Finishing)

This is in addition to SOE lab manual and lab specific safety instructions.

**In case of doubt, always ask.**



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## 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>

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## 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](tel: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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## 9 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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## 10 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>