



# ENGG\*2180 Introduction to Manufacturing Processes

01

Winter 2022

Section(s): C01

School of Engineering

Credit Weight: 0.50

Version 2.00 - January 10, 2022

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## 1 Course Details

### 1.1 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 processes will be covered in order to provide the students with a better understanding of the relations between the parameters involved.

**Pre-Requisites:** ENGG\*2160

**Co-Requisites:** ENGG\*2120

### 1.2 Course Description

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.

### 1.3 Timetable

**Lectures:** Tuesday and Thursday 10:00 AM - 11:20 AM , Inclass , check lecture format and link on courselink

**Laboratory: You are only allowed to attend the section you are registered in. Please check courselink for Lab sections and lab schedule.**

**Laboratory Sections: Machine Shop THRN 1015 Lab sessions will be Virtual via zoom meetings until Jan 24 2022 as posted on courselink. Beyond that labs are physical and Mandatory, no Makeup for labs and no reassignment of lab weight to other course activities.**

Section 1 Monday 8:30 AM - 10:20 AM  
 Section 2 Thursday 1:30 PM-3:20 PM  
 Section 3 Tuesday 1:30 PM = 2:30 PM  
 Section 4 Wednesday 8:30 AM - 10:20 AM  
 Section 5 Friday 3:30 PM-5: 20 PM  
 Section 6 Thursday 3:30 PM-5:20 PM  
 Section 7 Monday 3:30 PM - 5:20 PM  
 Section 8 Wednesday 3:30 PM- 5:20 PM  
 Section 9 Tuesday 3:30 PM - 5:20 PM

### 1.4 Final Exam

Final EXAM (45%) Thursday April 14 2022, 7:00 - 9:00 PM

Room TBA.

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

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## 2 Instructional Support

### 2.1 Instructional Support Team

**Instructor:** Dr. Ibrahim Deiab Ph.D., P.ENG  
**Email:** ideiab@uoguelph.ca  
**Telephone:** 5198244120  
**Office:** RICH 2521  
**Office Hours:** Office hours: TBA, via email or by appointment.

**Lab Technician:** Barry Verspagen  
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**Lab Technician:** David Wright  
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**Office:** THRN 1023

**Lab Technician:** Ken Graham  
**Email:** kgraha06@uoguelph.ca  
**Telephone:** +1-519-824-4120 x53924  
**Office:** THRN 1025

### 2.2 Teaching Assistants

inouzil@uoguelph.ca Ibrahim Nouzil  
 cpowel02@uoguelph.ca  
 Carter Powell  
 msalahsh@uoguelph.ca Masoomah Salahshoor

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## 3 Learning Resources

### 3.1 Required Resources

#### Course Website (Website)

<https://courselink.uoguelph.ca/>

Course material, news, announcements, and grades will be regularly posted to the ENGG\*2180 Courselink site. You are responsible for checking the site regularly.

#### Fundamentals of Modern manufacturing (Textbook)

M Mikell P. Groover, Groover's Principles of Modern Manufacturing SI Version, Wiley.

#### Handouts (Other)

Check Courselink regularly.

### 3.2 Additional Resources

#### Lecture Information (Notes)

All the lecture notes will be posted on the web page.

Some examples and material will be distributed during the lectures only.

Please note that power point presentations are not always comprehensive of all materials covered. you need always to consult your textbook or extra slides.

#### Lab Information (Other)

The lab component is going to be face to face ( Beyond Jan. 24 2022) and its mandatory. Details about labs and project will be discussed in class and posted on courselink. .

#### Assignments (Other)

Assignments handouts and due dates will be posted on Courselink.

#### Exams (Other)

The instructor reserves 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.

1. Sharing of calculators, formula sheets, if applicable, or use of smart phones as calculators is not allowed.
2. Grading is based on the procedure, correctness of numerical calculations and final answer.

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## 4 Learning Outcomes

### 4.1 Course Learning Outcomes

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

1. 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
  - a. Demonstrate familiarity with statistical quality control

## 4.2 Engineers Canada - Graduate Attributes (2018)

Successfully completing this course will contribute to the following:

#	Outcome	Learning Outcome
1	Knowledge Base	1, 2
1.3	Recall, describe and apply fundamental engineering principles and concepts	1, 2
1.4	Recall, describe and apply program-specific engineering principles and concepts	1
2	Problem Analysis	1
2.4	Execute an engineering solution	1
5	Use of Engineering Tools	1, 3
5.1	Select appropriate engineering tools from various alternatives	1, 3

#	Outcome	Learning Outcome
5.2	Demonstrate proficiency in the application of selected engineering tools	1, 3
5.3	Recognize limitations of selected engineering tools	1, 3

## 5 Teaching and Learning Activities

### 5.1 Lecture

**Topics:** Introduction to Manufacturing

**Topics:** Metal-casting processes

**Topics:** Theory of metal cutting

**References:** Chapter 17

**Topics:** Machining operations and machine tools

**Topics:** Economics of metal cutting

**Topics:** Metal forming

**Topics:** Joining processes

**Topics:** Non-conventional processes

**Topics:** Quality control

**Topics:** Review and Evaluation

### 5.2 Tentative

Please note that the number of lectures allocated to each topic and the order of topics coverage is tentative. The instructor at his discretion may modify the topic delivery sequence.

### 5.3 Other Important Dates

**Monday, January 10:** Classes commence Virtual setting

ENGG2180 first lecture on Tuesday Jan 11. , In class lecture will start on Tuesday Jan 25 2022, unless instructed otherwise. ( Class Room Rich 2520)

**Week of Monday, February 21 –:** WINTER BREAK

**Friday March 11** 40<sup>th</sup> class day.

**Friday April 8:** Last day of classes.

Important dates can be found here: <https://calendar.uoguelph.ca/undergraduate-calendar/schedule-dates/winter-semester/>

## 6 Assessments

### 6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Quizzes	5
Homework	0
Labs and project	20
Midterm Exam(s)	30
Final EXAM	45
Total	100

### 6.2 Assessment Details

#### Quizzes (5%)

**Learning Outcome:** 1, 1, 2

Thursday Jan. 27

Thursday Feb. 10

Thursday March 10

Thursday March 31

#### Homework (0%)

Homework problems will be posted on Course link and key solution will be posted a week later. Homework weight is 0%, however it is highly recommended that you go through and solve them.

### Tentative Out-of-class Homework sets

HW # 1	Casting
HW # 2	Metal forming
HW # 3-5	Metal cutting
HW # 6	Welding
HW # 7	Statistical quality control
Project	Due and presented in the last lab session, details will be posted on CourseLink

### Labs and project (20%)

**Learning Outcome:** 1, 2, 3

Lab sessions are 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.

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

### Midterm Exam(s) (30%)

**Date:** Tuesday Feb. 15 2021 and Tuesday Mar. 22 2021

**Learning Outcome:** 1, 2

### Final EXAM (45%)

**Learning Outcome:** 1, 1, 2

Final EXAM (45%) Thursday April 14 2022, 7:00 - 9:00 PM

As set by Registrar, Room TBA.

## 6.3 Assessment Dates

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.

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# 7 Course Statements

## 7.1 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 instructors. 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 instructors within the first two weeks 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 and have the labs, project and quizzes count towards your grade, students must obtain a grade of 50% or higher on the exam portion (final exam and midterms).

**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.

**Remarking of midterms:** Consideration for remarking of midterms will only be made if the request is made within two weeks from when the midterms are returned to students.

**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 a priori.

**Late Lab Reports:** Late submissions of lab reports will be deducted 5% for each business day that they are late.

## 7.2 Communication & Email Policy

Please use lectures and office hours 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.**

# 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 grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

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

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

### **9.3 Drop Date**

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

## 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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

## 9.6 Academic Integrity

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 encourages academic integrity. 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.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

## 9.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, 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 that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

## 9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

## 9.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

## 9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

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