Western University
Department of Mechanical & Materials Engineering

MME 3348A – Manufacturing Processes

COURSE OUTLINE – Fall 2025

CALENDAR DESCRIPTION:

This course introduces modern industrial processes in the manufacturing of various engineering products. It studies the relationships between materials properties, manufacturing processes, and the performances of the finished components. The course combines theoretical principles with practical applications to equip students with the skills to address contemporary challenges in manufacturing industries.

COURSE INFORMATION:

Instructor:	HaoTian Harvey Shi, Ph.D., P.Eng. Email: harvey.shi@uwo.ca
Lectures:	See https://draftmyschedule.uwo.ca/ for details
Tutorials/Labs:	See https://draftmyschedule.uwo.ca/ for details

PREREQUISITES:

ES 1021A/B, MME 2202A/B or CEE 2202A/B, MME 2260A/B
Unless you have either the requisites for this course or written special permission from your Dean to enrol in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

ANTIREQUISITES:

N/A

ACCREDITATION UNITS:

Engineering Science = 50%, Engineering Design = 50%

TOPICS:

1. Introduction to Manufacturing Processes
2. Materials Properties and Their Selection for Manufacturing
3. Metal-Casting Processes & Technologies
4. Forming & Shaping Processes & Technologies
5. Machining Processes & Tools
6. Joining and Surface Processes
7. Micromanufacturing and Microelectronics
8. Metrology & Quality Assurance
9. Advanced & Green Manufacturing

Learning Outcomes

The Mechanical and Materials Engineering Program has been accredited by Canadian Engineering Accreditation Board (CEAB) of Engineers Canada. Accredited programs provide the academic requirements for licensure as a professional engineer in Canada. Western Engineering has defined indicators of the 12 Graduate Attributes (GAs) that the CEAB expects graduating engineering students to demonstrate. The connections between course learning outcomes and Western Engineering's GA Indicators are identified below.

Upon successful completion of this course, students will be able to:

1. Understand the various modern processes in manufacturing (KB3)
2. Analyze correlations and tradeoffs for different processes (PA1, I3)
3. Solve governing equations of manufacturing processes for various parameters and configurations (PA1)
4. Develop structure-processing-property relationships (KB3)
5. Use standard reference sources to compare processes (PA1, ET1)
6. Develop formal process selection strategies (PA2)
7. Analyze and interpret data from lab experiments in relation to theoretical/ empirical predictions for manufactured parts in a team (IN3, IT1)
8. Generate diverse set of geometries optimized for industrial processes and select the best process based on further analysis (D2, D3)
9. Relate process parameters and quality of the final part with metrology (ET1)
10. Integrate considerations of sustainability and environmental impact of manufacturing processes (IESE2, IESE3)
11. Understand the role of machinability of materials in the manufacturing of a new product (KB4)

CONTACT HOURS: 3 lecture hours, 2 tutorial hours, Two 3-hour lab activities, half course

TEXTBOOK: *Groover* - Fundamentals of Modern Manufacturing: Materials, Processes, and Systems 7th Edition (Required) Available in UWO Bookstore

https://www.wiley.com/Fundamentals+of+Modern+Manufacturing%3A+Materials%2C+Processes%2C+and+Systems%2C+7th+Edition-p-9781119475217

Kalpakjian & Schmid - Manufacturing Engineering & Technology

UNITS: S.I. units will be used exclusively.

EVALUATION: The final grade is computed as follows:

Assignments	**8%**
Assignment #1: Oct. 6th, 2025	
Assignment #2: Oct. 20th, 2025	
Assignment #3: Nov. 10th, 2025	
Assignment #4: Nov. 24th, 2025	
(3-day grace period for all assignments)	
Lab Work	**14%**
Course Project	**28%**
Interim Report:	8% (Week of Oct. 27th)
Final Report & Presentation:	20% (Week of Dec. 1st) – **Designated Assessment**
Final examination	**50%**
Held during December final examination period	

COURSE POLICIES: The following course-specific policies will be enforced throughout the course:

General

- **All lectures will be held in-person**
- Dates and other evaluation details are tentative and may be changed by the instructor. Notification will be sent through OWL
- Exams will cover material presented in the textbook, lectures, lecture notes, laboratory sessions, assignments, and tutorials, *as well as application and extension of these topics to new situations*

Assignments

- Assignments are due by 9:00 am local time at Western
- 3-day grace period for all assignments without penalties. Since this course has flexible assignment deadlines, any related academic consideration requests may be denied.
- **Assignments must be submitted electronically via Gradescope**
- While you are encouraged to discuss the assignments with other students, it is expected that all students fully understand all submitted work from their group, and be able to reproduce any steps therein individually
- Assignments are graded pass/fail, with reasonable effort (up to the discretion of the TA or instruction) granted full credit
- Solutions will be posted and discussed in tutorials
- Individual feedback may be provided during office hours (TA or Professor)

Project

- Project is done in groups of 4 students
- Equal contributions expected from all group members (contribution forms to be filled with submission)
- If one student applied for academic consideration, then, the material by the rest of the group shall be submitted by deadline, and final version submitted after academic accommodation ends

Final examination

- The in-person final exam will be *close-book, an aid sheet may be provided*
- *Students must obtain at least 50% grade on the final exam to pass the course*

Non-programmable calculators may be used. Computers, smartphones, tablets, etc. are not allowed

COVID-19 CONTINGENCY:	In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (*i.e.*, at the times indicated in the timetable) or asynchronously (*e.g.*, posted on OWL for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online at the discretion of the course instructor
ENGLISH:	In accordance with Senate and Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests and examinations for the improper use of English. Additionally, poorly written work with the exception of final examinations may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.
CONSULTATION HOURS:	Prof. HaoTian Harvey Shi Office: SEB 3089 (Appointments arranged by email)

General Faculty / University Policies

The Faculty of Engineering and Western University have overarching policies that prescribe how undergraduate courses should run. The course-specific policies described above should be considered *in addition to* those overarching policies, or as course-specific interpretations of them. In the event of contradictions or confusion between course-specific policies above and general Faculty / University policies, please contact your course instructor for clarification.

Western Engineering's undergraduate polices can be found by navigating to:
https://www.eng.uwo.ca/undergraduate/academic-support-and-accommodations/policies.html

and then clicking the "*Engineering Undergraduate Policies framework*" link.