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 timetable for details
Tutorials/Labs:	See timetable 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:

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. Develop economic analysis for process/material selection (EPM1)
10. Relate process parameters and quality of the final part with metrology (ET1)
11. Integrate considerations of sustainability and environmental impact of manufacturing processes (IESE2, IESE3)
12. Understand the role of machinability of materials in the manufacturing of a new product (KB4)

CONTACT HOURS: 3 lecture hours, 2 tutorial hours, 0.5 laboratory hours/week, half course

TEXTBOOK: *Groover* - Fundamentals of Modern Manufacturing: Materials, Processes, and Systems (Required)

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	
(5-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)
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
- 5-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
- Students must notify the instructor if they require accommodation or special considerations for the final exam

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)
CHEATING:	University policy states that cheating, including plagiarism, is a scholastic offense. The commission of a scholastic offence is attended by academic penalties which might include expulsion from the program. If you are caught cheating, there will be no second warning. (see Scholastic Offence Policy in the Western Academic Calendar).
SSD:	*Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.*
INTERNET AND ELECTRONIC MAIL:	Students are responsible for regularly checking their Western e mail and the course web site (https://owl.uwo.ca/portal/) and making themselves aware of any information that is posted about the course. If the student fails to act on information that has been posted on these sites and does so without a legitimate explanation (*i.e.* those covered under the illness/compassionate form), then there are NO grounds for an appeal.
NOTE:	The above topics and outline are subject to adjustments and changes as needed. Students who have failed an Engineering course (*i.e.* <50%) must repeat all components of the course. No special permissions will be granted enabling a student to retain tutorial, assignment or test marks from previous years. Previously completed assignments and tutorials cannot be resubmitted for grading by the student in subsequent years.
ACCOMODATION POLICY	**Accommodation Policies** Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: Academic Accommodation for Students with Disabilities. For Western University policy on Consideration for Student Absence, see Policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs and for the Student Medical Certificate (SMC), see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

RELIGIOUS ACCOMMODATION

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar.

STATEMENT ON GENDER-BASED AND SEXUAL VIOLENCE

Western is committed to working to end gender-based and sexual violence on campus and in our community and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced gender-based or sexual violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts, here: https://www.uwo.ca/health/gbsv/support/get-help.html. To connect with a case manager or set up an appointment, please contact support@uwo.ca.

USE OF GENERATIVE ARTIFICIAL INTELLIGENCE (AI)

The use of generative Artificial intelligence (GenAI) tools won't be discouraged in the Faculty of Engineering. As we pride ourselves on building the future we can't hide from the use of GenAI tools to contribute to the understanding of the course materials. You are able to use GenAI tools as follows:

- For any written assignment, except take-home exams, you may use a GenAI tool to help you brainstorm or frame your initial ideas and grammar. However, your final submission must be entirely in your own words and demonstrate your individual experience and insight.
- All GenAI tools used at any point of the course with the intent of helping with homework, assignments or any other assessment content must be disclosed and referenced appropriately.

GenAI tools use won't be permitted in any type of examination or other assessments where the faculty have prohibited their use. If use of GenAI tools is detected by the instructor in these instances, academic offences penalties might be imposed against the student.