

MME 4490A/B – Engineering in a Global Context: Advanced Manufacturing

COURSE OUTLINE - 2025-2026

CALENDAR DESCRIPTION:	The course focuses on advanced manufacturing topics such as enhanced product development, modeling, and fabrication techniques as well as the emerging Industry 4.0 concept. The international context of the course is expected to strengthen students' skill and understanding of manufacturing, as performed in a global and interconnected economy.	
COURSE INFORMATION:	Instructor:	Dr. Remus Tutunea-Fatan, PEng Office: ACEB 3462 Phone: (519) 661-2111, ext. 88289 Email: rtutunea@eng.uwo.ca
	Lectures:	28 hours (abroad*, May 8 – 23, 2026)
	Hands-on activities (laboratories, mandatory field trips, project)	28 hours (abroad*, May 8 – 23, 2026)
	* The “abroad” component of the course will take place at the partner academic institution, namely Karlsruhe Institute of Technology (KIT), Germany. All course activities scheduled at the partner institution (in-class lectures/labs, technical field trips, etc.) will be concentrated in the form of a two-week academic visit to KIT between May 8 and May 23, 2026.	
PREREQUISITES:	Enrolment in the third year of the Mechanical, Mechatronic or Integrated Engineering program. Students enrolled in the third year of other Western Engineering or other Canadian Engineering programs are also eligible to enroll, subject to the approval of their own home program.	
CONSULTATION HOURS:	By advance notice via email or drop in.	
ACCREDITATION UNITS:	Engineering Science = 100%	
TOPICS:	• Product development • Manufacturing of composite components for automotive applications • Machining of fiber-reinforced composites • Circular economy in manufacturing • AI augmentation of manufacturing processes • Automated manufacturing systems	
LEARNING OUTCOMES	Upon the successful completion of the course, students will: • Understand and evaluate the principles underlying the manufacturing processes and systems presented in the course • Apply manufacturing concepts during hands-on laboratory activities and related experiential learning exercises	

- Assess how advanced manufacturing topics, such as composite processing, machining, automation, AI augmentation, and circular economy concepts, are implemented in industrial practice
- Develop the ability to identify and address manufacturing problems arising in an international context
- Demonstrate an international perspective on engineering practice in a global industrial environment

CONTACT HOURS: 2 lecture hours/week, 2 laboratory hour/week, 0.5 course

**RECOMMENDED
TEXTBOOKS:** Not applicable.

EVALUATION: The final course grade will be determined based on a take-home exam to be assigned submitted at the beginning of the next academic year (Fall 2026 term).
All course activities are mandatory and will take place under the supervision of the Western Engineering instructor to also accompany the class to KIT.

UNITS Metric

**COURSE POLICY
ON THE USE OF
GENERATIVE AI
(GENAI)** GenAI is not required and generally not recommended for this course. Limited use is permitted only for clarity, grammar, organization, or formatting of written submissions. GenAI may not be used to generate technical analysis, engineering content, lab/field reflections or any other substantive course work expected to be completed independently by the student. Students remain fully responsible for the technical correctness, originality and safe engineering practices.
Any GenAI use must be fully disclosed, including the tool used, date(s) of use, purpose of use, and what the student verified or changed. Students who choose not to use GenAI may rely on course materials, assigned readings, and instructor support. Undisclosed or inappropriate use of GenAI, including submission of AI-generated technical work as one's own or inclusion of fabricated or unsafe content may result in academic penalties in accordance with [Western Engineering policies](#).

General Faculty / University Policies

In the event of contradictions between course-specific policies above and general Faculty / University policies described below, please contact your course instructor for clarification.

ATTENDANCE

A student is entitled to be examined in courses in which registration is maintained, subject to the following limitations:

- 1) A student may be debarred from writing the final examination for failure to maintain satisfactory academic standing throughout the year.
- 2) Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean (or delegate) of the Faculty offering the course (after due warning has been given). On the recommendation of the department concerned, and with the permission of the Dean (or delegate) of that Faculty, the student will be debarred from taking the regular examination in the course. The Dean (or delegate) of the Faculty offering the course will communicate that decision to the Dean, Undergraduate of the Faculty of Registration.

POLICY ON MISSED DELIVERABLES

To avoid penalties, students missing the deadline of a deliverable designated as “mandatory” will have to report the absence by submitting an Academic Consideration Request through [Student Absence Portal](#). In this case, both the academic consideration request and supporting documentation should be submitted as soon as possible and no later than 48 hours after the deadline of the missed deliverable. Students should seek the guidance of their Academic Advisor if the request for academic consideration was not submitted timely.

For undocumented absences for deliverables that are not designated as mandatory, the Academic Consideration Request must be submitted within 48 hours from the deadline of the missed deliverable.

Requests for academic consideration must include the following components:

- a) Self-attestation signed by the student
- b) Indication of the course(s) and assessment(s) affected by the request
- c) Supporting documentation as relevant.

Requests for academic consideration without supporting documentation (“undocumented absences”) cannot be approved more than one per term and per course.

Undocumented absences cannot be used for examinations scheduled by the Office of the Registrar during official examination periods (including take-home final exams and December mid-year exams for full courses) and practical laboratory and performance tests typically scheduled in the last week of the term. Undocumented absences also cannot be used for the “designated assessment” in each course. When flexibility in assessment exists and is clearly stated in the course outline, both undocumented absences and academic consideration requests with documentation may be denied.

Undocumented absences cannot be used for submitted for attempted or completed work, whether online or in-person. This includes (but is not limited to) term tests, performances, presentations, and laboratory/tutorial sessions to which the student has reported. Requests for retroactive relief are addressed in the Undergraduate Student Academic Appeals policy.

Documentation for medical illness, when required, must include the completion of a Western Student Medical Certificate (SMC) or, where that is not possible, equivalent documentation, by a health care practitioner.

Once the request and supporting documents have been received and reviewed, appropriate academic consideration, if granted, shall be determined by the instructor in consultation with the academic advisor, in a manner consistent with the course outline. Of note:

- Unless decided otherwise by the Associate Dean, Undergraduate, the default assumption should be that the instructor cannot ask and is not entitled or required to know the reason for which the student has missed a course deliverable deadline (assignments, term tests, final exam, etc.) or a timetabled course component (lecture, tutorial, laboratory session, etc.). This applies to both documented and undocumented requests for academic consideration. Strict policies in this regard are applicable to academic considerations that are requested for medical reasons or other grounds covered by the [Freedom of Information and Protection of Privacy Act](#).
- The approval of the requests for academic consideration accompanied by supporting documentation falls within the responsibility of the Office of Engineering Undergraduate Services. Depending on the situation, the instructor might or might not be consulted during the approval process. However, the instructor must be consulted when determining the form of academic relief to be granted to the student.
- Unlike the requests accompanied by supporting documentation, the instructor is solely responsible for the approval of the requests for academic consideration that are not accompanied by supporting documentation (“undocumented absences”). These requests must be approved according to the terms of the Senate-approved policy and their limit is “one per course and per term”. As noted above and within the policy, additional provisions (on the flexibility of the deadlines, etc.) may translate into the automated denial of the request for academic consideration.
- Submitting a request for academic consideration (regardless if accompanied or not by supporting documentation) does not warrant its approval.

Academic consideration may include extension of deadlines, waiver of attendance requirements for classes/labs/tutorials, or re-weighting of course requirements. Some forms of academic consideration, such as arranging Special Examinations, assigning a grade of Incomplete (INC), or granting late withdrawals without academic penalty (WDN), may only be granted by the Academic Advising office of the Faculty of Registration.

An instructor may deny academic consideration for any assessment that is not required in the calculation of the final grade (e.g., “8 of 10 quizzes”). This assessment flexibility must be indicated on the course outline.

An instructor may deny academic consideration relating to the timeframe submission of work where there is already flexibility in the submission timeframe (e.g., 72-hour submission window). This assessment flexibility must be indicated on the course outline.

Additional terms on academic considerations are available in Senate Academic Policies: Rights and Responsibilities - [Academic Consideration – Undergraduate Students in First Entry Programs](#) as well as on the [Office of the Registrar](#) and [Engineering Undergraduate Services](#) webpages.

Submitting fraudulent supporting documentation constitutes a scholastic offense that will be penalized with severity.

POLICY ON LATE SUBMISSIONS

To avoid penalties for late submissions, students are required to advise - **prior to the due date of the deliverable** - the instructor that they will be unable to submit the deliverable on time. Nonetheless, the instructor has the right to deny deadline extensions, particularly when the deliverable does not have a flexible deadline or when the extension requested falls outside of the aforementioned “no-penalty” period (72 hours) for deliverables with flexible deadlines.

If requested by the instructor, students should submit an Academic Consideration Request Form and provide documentation supporting their absence.

If an extension is granted, an individual deadline should be set by the instructor and communicated to the affected student. The approval of the Associate Chair, Undergraduate and Associate Dean, Undergraduate (“Undergraduate Program Leaders”) are required if the revised deadline was set within the examination period.

The approval of the Undergraduate Program Leaders is not required if the revised deadline was set prior to the last day of classes.

Some courses have built-in flexibility for assignment deadlines or the total number of assignments that will be graded. In these cases, the instructor might choose to deny any late submissions. Please review the course outline for details on course-specific policies and approach the instructor for additional clarifications on this matter.

POLICY ON MISSED FINAL EXAMINATIONS

Students who are unable to write the final exam are required to report their absence by submitting an Academic Consideration Request through [Student Absence Portal](#). The request for academic consideration should be submitted as soon as possible and no later than 48 hours after the missed final examination.

In case of missed final examinations, students should be prepared to provide Engineering Undergraduate Services with supporting documentation within 48 hours of the missed final examination. The following circumstances are not considered grounds for missing a final examination or requesting special examinations: common cold, headache, sleeping in, misreading/misinterpreting final examination timetable and travel arrangements.

In order to receive permission to write a Special Examination, you must obtain the approval of the Associate Dean, Undergraduate that is issued in response to the submitted Academic Consideration Request. **It is student’s responsibility to find out the date, time, and location of the Special Examination** for which they were approved.

RELIGIOUS ACCOMMODATIONS

When scheduling unavoidably conflicts with religious holidays, which (a) require an absence from the University or (b) prohibit or require certain activities (i.e., activities that would make it impossible for the student to satisfy the academic requirements scheduled on the day(s) involved), no student will

be penalized for absence because of religious reasons, and alternative means will be sought for satisfying the academic requirements involved. If a suitable arrangement cannot be worked out between the student and instructor involved, they should consult the appropriate Department Chair (or delegate) and, if necessary, the student's Dean (or delegate).

It is the responsibility of such students to inform themselves concerning the work done in classes from which they are absent and to take appropriate action.

Additional terms on religious accommodations are available in the Academic Handbook, Rights and Responsibilities, [Accommodation for Religious Holidays](#).

ACADEMIC INTEGRITY

In the Faculty of Engineering, we encourage students to create a culture of honesty, trust, fairness, respect, responsibility, and courage, befitting the professional degree you are pursuing.

Please visit [Academic Integrity Western Engineering](#) for additional information on this topic.

ACADEMIC OFFENSE

Plagiarism means using another's work without giving credit. The university has rules against plagiarism and other scholastic offences. Western Engineering has a zero-tolerance policy on plagiarism. The minimum penalty is zero on the course work and a repeat offence will earn you zero on the course. A third offence may lead to expulsion from the university.

[Scholastic Discipline for Undergraduate Students & Cheating, Plagiarism and Unauthorized Collaboration: What Students Need to Know](#)

Students must write their reports, essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. University policy states that cheating, including plagiarism, is a scholastic offence. 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.

All required papers may be subject to submission for textual similarity review to commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents on the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (<http://www.turnitin.com>). Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, in the relevant section of the Academic Handbook:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

POLICY ON THE USE OF GENERATIVE AI

The use of Generative Artificial Intelligence (GenAI) tools is generally permitted in the Faculty of Engineering unless otherwise stated in the course outline. Students must disclose when GenAI was used while preparing the response to a course deliverable.

Additional terms on the use of GenAI tools for coursework purposes is available on the [AI at Western](#) website.

ACCESSIBILITY

Western is committed to achieving barrier free accessibility for persons with disabilities studying, visiting and working at Western. As part of this commitment, there are a variety of services, groups and committees on campus devoted to promoting accessibility and to ensuring that individuals have equitable access to services and facilities. To help provide the best experience to all members of the campus community, please visit the [Accessibility Western University](#) for information on accessibility-related resources available at Western.

Students with disabilities may arrange for academic accommodation at Western. For a more detailed explanation, please visit [Academic Support & Engagement -Academic Accommodation](#).

INCLUSIVITY, DIVERSITY AND RESPECT

The Faculty of Engineering at Western University is committed to creating equitable and inclusive learning environments that value diverse perspectives and experiences. We recognize that university courses often marginalize students based on social identity characteristics such as, but not limited to, Indigeneity, race, ethnicity, nationality, ability, gender identity, gender expression, sexuality, age, language, religion, and socioeconomic status. Understanding this, we strive to facilitate equitable experiences and inclusion within the classroom by respecting and integrating multiple ways of knowing, being, and doing. Please visit the [Office of Equity, Diversity and Inclusion](#).

HEALTH AND WELLBEING

- [Health & Wellness Services – Students](#) - Offers appointment-based medical clinic for all registered part-time and full-time students.
- [Mental Health Support](#) - Provides professional and confidential services, free of charge, to students needing assistance to meet their personal, social and academic goals. Services include consultation, referral, groups and workshops, as well as brief, change-oriented psychotherapy.
- [Crisis Support](#) - For immediate assistance, please visit Thames Hall Room 2170 or call 519-661-3030. The crisis clinic operates between 11:00 am - 4:30 pm. For after-hours crisis support, click [here](#).

[Gender-Based Violence and Survivor Support](#) - Western [is committed to reducing incidents of gender-based and sexual violence](#) 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](#). To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Important Links

[Western Academic Calendar](#)

[Academic Rights and Responsibilities](#)

[Engineering Progression Requirements and Academic Regulations](#)

[University Students' Council \(USC\) - Services](#)

[Important Dates and Deadlines](#)

Academic considerations: [Academic Calendar](#), [Senate-approved](#), [Office of the Registrar](#), [Western Engineering](#)
[Accommodations for Religious Holidays](#)
[Scheduling of Assignments, Tests and Examinations](#)
[Forms for Engineering Students](#)
[Office of the Registrar](#)
[Retention of Electronic Version of Course Outlines \(Syllabi\)](#)
[Academic Appeals](#)
[Student Absence Portal](#)

Note: These regulations apply to all students registered in the Faculty of Engineering irrespective if the course taken is offered by the home faculty or a different faculty on campus.

Contact Information:

Engineering Undergraduate Services:	SEB 2097
Phone: 519-661-2130	E-mail: engugrad@uwo.ca
Mechanical Engineering:	SEB 3002
Phone: 519-661-4122	E-mail: mmeundergraduate@uwo.ca
Chemical & Green Process Engineering:	TEB 477
Phone: 519-661-2131	E-mail: cbeugrad@uwo.ca
Civil Engineering:	SEB 3005
Phone: 519-661-2139	E-mail: civil@uwo.ca
Electrical, Mechatronics & Software Eng:	TEB 279
Phone: 519-661-3758	E-mail: eceugrad@uwo.ca
Integrated Engineering	ACEB 2410
Phone: 519-661-6725	E-mail: engceli@uwo.ca
Office of the Registrar/Student Central	WSSB 1120
Phone: 519-661-2100	