Western University
Department of Mechanical & Materials Engineering

MME 2260a - Industrial Materials

COURSE OUTLINE – 2025-2026

CALENDAR DESCRIPTION:

The principles and practice of shaping and strengthening industrial materials.

COURSE INFORMATION:

Instructor: Prof. Robert J. Klassen Ph.D., P.Eng.
Email: rjklasse@uwo.ca

Lectures: See Draft My Schedule

Labs: Four experiments will be performed over the term during the scheduled lab periods and each student is required to prepare and submit a report for each experiment. A laboratory manual and information on when the experiments will begin will be posted on the Brightspace course website.

PREREQUISITES:

ES 1021a/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.

ACCREDITATION UNITS:

Engineering Science = 100%

TOPICS:

1. Structure and Properties of Materials
2. Microstructures of Pure Metals and Alloys
3. Production and Properties of Ferrous Alloys
4. Production and Properties of Nonferrous Alloys
5. Production and Properties of Ceramics
6. Production and Properties of Polymers

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 explain the key fundamental principles governing the following topics of materials science and understand their, environmental impact, and application in common manufacturing processes. Corresponding graduate attribute indicators are shown in brackets.

1. Graphical techniques for describing microstructure of metals and alloys. (KB2)
2. Effect of cooling rate on the microstructure of crystalline metals and alloys and its applications in solidification and heat treatment processes. (KB2, PA3)
3. Extraction processes for obtaining pure metals from their native ores. (KB2, IES1)
4. Alloying processes using basic oxygen furnaces and electric arc furnaces. (KB2)
5. Solid-state and liquid-state fabrication of ceramics. (KB2)
6. Common polymers structures and properties. (KB2)

CONTACT HOURS: 3 lecture hours per week and 12 laboratory hours per term.

LABORATORIES: 4 laboratory exercises are to be completed in the scheduled periods.

UNITS: S.I. units will be used

EXAMINATIONS AND QUIZZES: The term tests and the final exam will be **closed book**. Formula sheets will be provided.

2 Term tests, 4 lab experiments/reports, final examination.

EVALUATION: The final grade is computed as follows:

Term Test 1 (date to be announced)	20%
Term Test 2 (date to be announced)	20%
4 Laboratories (Schedule to be posted on course website)	10%
Final Exam (date to be announced)	50%

COURSE POLICIES

Laboratory sessions

- Passing the laboratory component of the course (i.e. at least 50% mark in the laboratory component) is necessary to pass the course.
- Students who arrive 30 minutes after the scheduled lab time or miss the lab without legitimate reason will be given one-time-only chance to conduct the lab with 50% penalty. Any reoccurrence will count as a missed lab.
- Students who miss a lab with written academic accommodation are required to reschedule the lab by contacting the course instructor. Failure to do so will result in a zero mark for that lab.
- Missing more than one lab without written academic consideration will result in the course failure.

Term tests

- No make-up term test options will be offered regardless of the circumstances for which the term test was missed.
- Missing a term test without written academic accommodation will result in a mark of zero for that test.
- Missing a term test with written academic accommodation will automatically shift the weight of the missed term test to the final exam.

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.