This is the first course in the field of structure-property relationships for engineers. However, for some engineering disciplines at Western, this is the only course on material properties. Therefore, the course material includes a combination of fundamental concepts in materials science and specific examples to illustrate the impact of material choice on component performance.

**CALENDAR DESCRIPTION:**
An introduction to the relationships between the microstructure and the engineering properties of metals, ceramics, polymers and composites. These relationships will be applied to demonstrate effective methods used to select materials for the design of engineering components.

**COURSE INFORMATION:**
Instructor: J. T. Wood  
Room: SEB 2097  
Email: jtwood@uwo.ca  
Lectures: Hybrid Online  
Asynchronous Lectures (W, F 8:30am)  
Synchronous Lecture (Th 1:30pm)  
Tutorials: Th 5:30 – 7:30 (via Zoom)  
Office Hours: TBD (via Zoom)

**ACCREDITATION UNITS:**
Science = 50%, Engineering Science = 50%

**COURSE LEARNING OBJECTIVES:**
On the successful completion of this course, the student will be able to:
1. Identify physical, mechanical, thermal and chemical properties of engineering materials  
2. Demonstrate effective use of the Cambridge Engineering Selector as a database of material properties and to screen candidate materials for engineering applications  
3. Relate the behaviour characterized by material properties to the underlying physics and chemistry that governs their behaviour.  
4. Perform basic calculations using material property data to justify engineering decisions.  
5. Present and justify engineering opinions using clear, concise language and calculations.

**CONTACT HOURS:**
2 asynchronous lecture hours, 1 synchronous lecture hour, 2 tutorial hours, half course

**TEXT:**
There are no REQUIRED textbooks for this course. The following are standard undergraduate textbooks that you may find useful as an additional source of material.

“Materials Science and Engineering” W.D. Callister Jr. and D.G. Rethwisch  
“Materials: Science, Engineering, Processing and Design” H. Shercliff, D. Cebon, M.F. Ashby  
“Engineering Materials 1: An Introduction to Properties, Applications and Design” D.R.H. Jones, M.F. Ashby

**QUIZZES and TERM TESTS:**
Quizzes will be conducted through OWL at the conclusion of units or significant sections of course content. There will be two term tests, conducted synchronously through OWL during the tutorial period. Tentative dates (to be confirmed) are:
October 15, 2020 and November 19, 2020

There will be no make-up midterms. In the event of an approved absence (i.e. illness with doctors note) the missed midterm grade will be added to the final exam.

**TUTORIAL:**

Two-hour tutorial sessions will be held every week (except for the Term Test dates listed above) to reinforce the material covered during the previous week(s) and complete tutorial exercises. Quizzes and midterms are mandatory.

**EVALUATION:**

The performance of students in this course will be evaluated on the basis of marks attained on the tutorial exercises, midterms, and a final exam.

**BASIS OF FINAL GRADE**

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<th>Percentage</th>
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<tr>
<td>Quizzes</td>
<td>30%</td>
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<tr>
<td>Term Tests</td>
<td>(2 x 20%)</td>
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<tr>
<td>Final Assessment</td>
<td>30%</td>
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The final assessment will be an open-book, take-home assignment released to the class on the

**USE OF RECORDINGS**

The synchronous lectures for this course will be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals under special circumstances. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the 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.

**ATTENDANCE:**

Any student who, in the opinion of the instructor, has not had sufficient engagement in this course, will be reported to the Dean (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean, the student will be debarred from taking the regular examination in the course.

**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).

**ACCESSIBLE EDUCATION:**

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 Accessible Education at 661-2111 x 82147 for any specific question regarding an accommodation.

**NOTE:**

The above topics and outline are subject to adjustments and changes as needed. Students who have failed an Engineering course (ie.<50%) must repeat all components of the course. No special permissions will be granted enabling a student to retain laboratory, assignment or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted for grading by the student in subsequent years.