| Instructor: | Prof. Andrew J. Boyd  
E-mail: andrew.boyd@mcgill.ca |
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<tr>
<td>Lectures:</td>
<td>M W 8:35 am – 10:25 am [ENGMC 13]</td>
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<tr>
<td>Tutorial:</td>
<td>T 8:35 am – 9:25 am [REDMUS AUD]</td>
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| Labs: | W 1:35 pm – 3:25 pm [ENGMD 177]  
R 2:35 pm – 4:25 pm [ENGMD 177] |
| Office Hours: | By appointment [ENGMD 482] |
| Course Description: | Classification of materials; atomic bonds; phase diagrams; crystallography; imperfections; mechanical behaviour; engineering properties and uses of ferrous metals, cement, concrete, timber and timber products, polymers, composites; durability and deterioration; prevention and protection; environmental influences; group laboratory projects |
| Required Text: | There is no required text for this course. Lectures, lab manuals and other handouts will be made available via website posting |
| Grading: | Test 1: 40% (February 27, 2013)  
Test 2: 40%  
Laboratory Reports: 10%  
Assignments/Quizzes: 8%  
WHMIS Certification 2% (February 6, 2013) |
| Course Policies: | Make-up exams will be granted upon presentation of a legitimate and relevant physician’s certification. Other requests will be considered IF requested prior to scheduled week of test. |
| Attendance Policy: | Students are responsible for all information covered in class or tutorial sessions, regardless of whether it appears in the lecture notes or other handouts. Attendance and participation in laboratory and tutorial sessions is mandatory. |
Tentative List of Topics to be Covered

**Materials and the Engineer** – Materials usage, sustainable development; natural resources; the 3 Rs; protection; renovation and rehabilitation.

**Nature of Materials** – Atomic structure, scale, and bonding; crystallography; defects; phase diagrams; mechanical testing.

**Cement and Concrete** – Aggregates (classification, properties, gradation, moisture conditions, nonstandard aggregate); portland cement (composition, chemistry, manufacturing, properties); supplementary cementing materials; admixtures; concrete (composition, hydration, ITZ, fresh & hardened properties, curing, durability).

**Structural Steel** – Production; classifications; properties; products; construction applications, alloying; treatments; durability; welding.

**Wood** – Classifications; microstructure; grain; defects; grading; moisture, shrinkage; properties; design; durability; wood based composites.

**Polymers** – Classifications; structure; properties; applications.

**Composites** – Classifications; applications; components (matrix, fibres; interface, additives); fabrication; properties.

**Asphalt** – Classifications; properties; durability; additives & fillers; recycling.

Useful References


McGill Policy Statements

*McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (for more information, see www.mcgill.ca/students/srr/honest/).*

*In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded.*

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