McGill

Department of Civil Engineering

CIVE 623 – *Durability of Materials*

Fall 2012

Instructor:	Andrew J. Boyd E-mail: andrew.boyd@mcgill.ca
Lecture:	R 9:00 am – 11:25 pm [ENGMC 12]
Office Hours:	By appointment
Course Objective:	To provide students with the resources to develop a strong familiarity with the durability issues related to construction materials; including concrete, wood, and steel.
Required Text:	There is no required text for this course. Lectures and other handouts will be made available via website postings.
Grading:	Test 1: 30% Test 2: 30% Lab Project: 20% Journal Club: 20%
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 the scheduled week of the exam.
Attendance Policy:	Students are responsible for all information covered in class regardless of whether it appears in the lecture notes or other handouts. Attendance at journal club presentations is mandatory.

Tentative List of Topics to be Covered

Introduction

Durability of Concrete

- Review of Concrete Technology
- Mass Transport Mechanisms
- Cracking
- Leaching & Efflorescence
- Sulfate Attack
- Acid Attack
- Salt Crystallization
- Reinforcement Corrosion
- Freezing & Thawing
- Surface Scaling
- Alkali-Aggregate Reaction
- Service Life Prediction
- Diagnosis, Remediation, and Protective Measures

Durability of Steel

- Review of Steel Technology
- Corrosion
- Factors Affecting Durability of Steel
- Environmental Parameters Affecting Steel Durability
- Diagnosis, Remediation, and Protective Measures

Durability of Wood

- Review of Wood Technology
- Deterioration Mechanisms
- Environmental Parameters Affecting Wood Durability
- Diagnosis, Remediation, and Protective Measures

Other Materials and Related Issues

Course Requirement Details

Test 1

Will be scheduled near the mid-point of the semester and will include all material covered up to that point.

Test 2

Will be scheduled following the end of classes for the semester and will include only that material covered after the first test.

Lab Project

Students will be required to perform small-scale short-term experimental projects (either in groups or individually depending upon class size) that investigate some aspect of material durability. A final report must be prepared that clearly illustrates the experimental program and results.

Journal Club

Each student will be required to perform two journal club presentations during the semester. This exercise will entail the student choosing a suitable, previously published journal paper related to the course content and presenting that paper to the class in a professional manner. Content of the presentation should be the same as if the student was presenting his own research at a conference, with the exception that a short critique of the paper must also be included.

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.

See www.mcgill.ca/students/srr/honest/ for more information

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.