



A POLYTECHNIC INSTITUTION

School of Manufacturing, Electronics & Industrial Processes
Program: Mechanical Engineering Technology
Option: Manufacturing

MANU 3316
Advanced Materials

Start Date: 5 Sep 2006	End Date: 15 Dec 2006
Total Hours: 54 Total Weeks: 15	Term/Level: 3 Course Credits: 4.0
Hours/Week: 4 Lecture: 2 Lab: 2	Shop: Seminar: Other:

Prerequisites

Course No.	Course Name
CHSC 2205	Engineering Materials 2
MECH 1210	Manufacturing Processes
MECH 2240	Strength of Materials

MANU 3316 is a Prerequisite for:

Course No.	Course Name
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Course Description

Investigates application of materials for 'extreme services' such as high temperature, corrosion or cryogenic applications as well as non-traditional materials and processes currently found in modern manufacturing. These include plastics, composites and their forming processes as well as powder metallurgy and ceramics.

Evaluation

Assignments / Quizzes	5	Comments: Student must pass both the lab and the theory part of the course in order to attain a passing grade. Failure of either the lab or theory portion will result in a mark of 'U' (Unsatisfactory).
Labs	25	
Midterm Exams	30	
Final Exam	40	
TOTAL	<u>100%</u>	

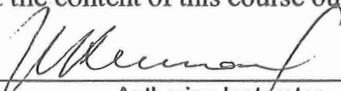
Course Learning Outcomes/Competencies

Upon successful completion, the student will be able to:

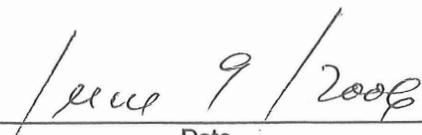
- Understand the problems associated with low temperature, high temperature and corrosive environment services, and apply a systematic selection process to material specification for such applications.
- Understand the principles of corrosion and corrosion protection.
- Understand the principles and methods used in powder metallurgy and ceramics processing.
- Perform basic fabrication processes related to FRP composites.

Verification

I verify that the content of this course outline is current.

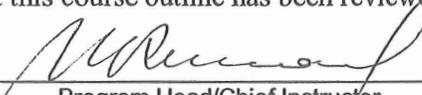


Authoring Instructor

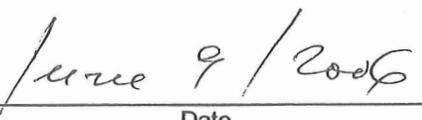


Date

I verify that this course outline has been reviewed.

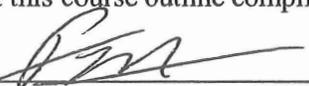


Program Head/Chief Instructor

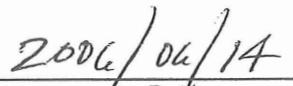


Date

I verify that this course outline complies with BCIT policy.



Dean/Associate Dean



Date

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

Instructor(s)

E. Kulhanek	Office Location: SW9 - 201J	Office Phone: 604-432-8530
	Office Hrs.: by appointment	E-mail Address: ekulhane@bcit.ca
G. Henderson	Office Location: SW9 - 106	Office Phone: 604-451-6725
	Office Hrs.: by appointment	E-mail Address: ghenders@bcit.ca

Learning Resources

Required:

- safety glasses or shop face shield
- suitable close fitting clothing capable of protecting arms and legs - **MUST BE WORN AT ALL TIMES** in the lab
- CSA approved (Green Triangle) safety footwear - puncture proof sole, steel toe and ankle support

Recommended:

- Budinsky: Engineering Materials
- ASM: Metals Handbook

Information for Students

Note: Please refer to BCIT policy number 5002, Student Regulations Policy, for additional information. Policies are available at <http://www.bcit.ca/about/administration/policies.shtml>.

Ethics: BCIT assumes that all students attending the institute will follow a high standard of ethics. Incidents of cheating or plagiarism may, therefore, result in a grade of zero for the assignment, quiz, test, exam or project for all parties involved and/or expulsion from the course.

Assignments: Assignments, lab reports or projects must be done on an individual basis unless otherwise specified by the instructor. Late assignments, lab reports or projects will be devalued 10% per day late to a maximum of 3 days late.

Makeup Tests, Exams or Quizzes: There will be **no** makeup tests, exams or quizzes. If you miss a test, exam or quiz, you will receive zero marks. Exceptions may be made for **documented** medical reasons or extenuating circumstances. In such a case, it is the responsibility of the student to inform the instructor **immediately**.

Attendance: The attendance policy as outlined in BCIT Policy 5002 will be enforced. Attendance will be taken at the beginning of each session. Students not present at that time will be recorded as absent.

Illness: If you miss an evaluation such as an assignment, quiz, exam, or project, or you miss 3 or more consecutive days of class, you must provide the department with a BCIT Student Medical Certificate (available at <http://www.bcit.ca/admission/downloads.shtml>). You may be asked to complete the work that you missed or the course evaluation may be adjusted to reflect the missed component(s).

Attempts: Students must successfully complete a course within a maximum of three attempts. Students with two attempts in a single course must get written permission from the Associate Dean to attempt the course for the third time. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the program.

Advancement: Students who fail three or more courses in a term cannot advance to the next term and may be asked to discontinue from the program.

Course Outline Changes: The material or schedule specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class.

Assignment Details

Schedule

Week of/ Number	Outcome/Material Covered	Reference/ Reading
1	Course overview, objectives and schedule Engineering materials classification Systematic material selection	
2 – 4	Composites: <ul style="list-style-type: none"> • fiber reinforced • particle reinforced • laminates 	
5 - 6	Polymeric materials	
7	Ceramics	
8	Powder metallurgy Midterm	
9 – 10	Stainless steel classification & properties	
11	Extreme service – low/hi temperature	
12 – 13	Corrosion	
14	Review	
15	Final Exam	