BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

School: Manufacturing & Industrial Mechanical
Program: Full time
Option: Mech/Plastics/Robotics

Course Outline

MECH 1210
Manufacturing Processes

Start Date: 04 Jan '06 **Start Time:**

End Date: 20 May '06 **End Time:**

Course Credits: 5.5 **Term/Level:** 2

Total Hours: 80
Total Weeks: 20

Hours/Week: 4 **Lecture:** 2 **Lab:** 2 **Shop:** **Seminar:** **Other:**

Prerequisites

Course No.	Course Name
None	

MECH 1210 is a Prerequisite for:

Course No.	Course Name
MANU3310	Material Removal
MANU3312	Computer Aided Manufacturing
MANU3314	Tool Design
MANU3316	Advanced Materials
ROBT3416	Computer Aided Design & Manufacturing

Course Calendar Description

This course covers the basics of the major manufacturing processes used today. Topics include metal cutting, metal joining, forming, casting and plastics processing as well as methods of measurement and inspection. An introduction to automated manufacturing processes such as Computer Numerical Control (CNC) of machine tools and robotics is included.

This course includes both lectures and "hands-on" shop experience.

Course Goals

This course will introduce students to the basics of the most common manufacturing processes. Lecture and textbook material will include descriptions of how they work, their relative strengths and weaknesses, and when to choose one process over another.

Students will also gain practical experience in using common processes in the machine shop and labs.

Evaluation

Final Exam	30%
Mid-term tests (2)	45%
Labs/Machine Shop	25%
TOTAL	100%

- BCIT policy requires students to attend and complete at least **90%** of lab sessions.
- Cheating, copying, and/or plagiarizing **will not be tolerated.**

Course Learning Outcomes/Competencies

Upon successful completion of this course, the student will be able to:

- Understand the basics of common manufacturing processes
- Perform some of the basic manufacturing processes safely

Course Content Verification

I verify that the content of this course outline is current, accurate, and complies with BCIT Policy.

Program Head/Chief Instructor

1/4/2006
Date

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

Instructor(s)

Bill Fane (lectures & CNC)	Office No.: Office Hrs.:	SW9-202 As posted	Office Phone: E-mail Address:	604-432-**8331** bill_fane@bcit.ca
Brian Ennis (foundry & machine shop)		SW9-202		604-451-**6830** brian_ennis@bcit.ca
Glenn Henderson (welding & machine shop)		SW9-106		604-451-**6725** glenn_henderson@bcit.ca
Brian Gaensbauer (robotics)		SW3-1975		604-432-**8876** brian_gaensbauer@bcit.ca
Emanuel Kulhanek (plastics)		SW9-201 J		604-432-**8530** emanuel_kulhanek @bcit.ca

NOTE: all e-mail contact with instructors must come from your myBCIT account

Learning Resources

Required:

1. See attached safety procedures for required safety equipment.

2. Two 3.5" high-density (1.44 Mb) floppy disks for CNC and Robotics labs.

3. TEXT:

   Manufacturing Processes for Technology - Fellers/Hunt - Prentice Hall

   Note:- First or Second Editions are acceptable

Supplemental:

Materials and Processes in Manufacturing - Degarmo/Black/Kosher - Prentice Hall

Machinery Handbook - Industrial Press Inc.

Machining Data Handbook - Metcut Research

Welding Handbook - American Welding Society

Information for Students

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

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**.

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.

Attendance: The attendance policy as outlined in the current BCIT Calendar 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: A doctor's note is required for any illness causing you to miss assignments, quizzes, tests, projects, or exam. At the discretion of the instructor, you may complete the work missed or have the work prorated.

Attempts: Students must successfully complete a course within a maximum of three attempts at the course. Students with two attempts in a single course will be allowed to repeat the course only upon special written permission from the Associate Dean. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the appropriate 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.

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.

A REMINDER: Cheating, copying, or plagiarizing will not be tolerated and will result in a zero mark for both students. Repeat offences can result in the student being dropped from the course, the program, or BCIT.

Assignment Details

Students will spend two hours per week in the shops, where they will gain "hands-on" experience with common manufacturing processes. These processes will include:

- Casting
- Turning
- Milling
- Welding
- Plastics
- Robotics
- CNC machining

Because of shop capacity, students will not complete all the shop sections in the same sequence. Each set will be divided into subsets X and Y of 10 students. During any given week, the subset X group will be doing something different from the matching Y group. In addition, each main set group (A, B, etc) will be on a different rotation schedule.

Each shop section will require a suitable written report from each student.

By the end of the term, every student will have completed all of the labs and will have manufactured enough parts to assemble a model car.

COURSE CONTENT

This is a tentative schedule, and is subject to revision as circumstances arise.

Week	Starting...	Topic	Chapter
1	2-Jan-05		
		Introduction; lab setup, sand castings	9
2	9-Jan-05	Sand castings	9
		Other castings	9
3	16-Jan-05	Measurements	3
		Cutting tool action	4
4	23-Jan-05	Machining: lathes	4
		Machining: lathes, mills	4
5	30-Jan-05	Machining: mills	4
		Tool materials; feeds & speeds	4
6	6-Feb-05	Drilling, broaching, etc	4
		Plastics	18
7	13-Feb-05	Plastics	18
		Plastics	18
8	20-Feb-05	Plastics	18
		EXAM	
9	27-Feb-05	Machining: Chemical, flame	6,7
		EDM	5
10	6-Mar-05	Material addition	8
		Rapid prototyping	handout
11	13-Mar-05	Spring Break: no classes	
12	20-Mar-05	Powder metallurgy	10
		Forming, extrusion	11
13	27-Mar-05	Forging, heading	11
		Drawing, stamping	11
14	3-Apr-05	Shearing, blanking, piercing	4
		Change of condition	12
15	10-Apr-05	Finishing	16,17
		Finishing	16,17
16	17-Apr-05	Easter Monday: no class	
		EXAM	
17	24-Apr-05	Joining	13, 14,15
		Joining	13, 14,15
18	1-May-05	Composites	19
		Health, safety, ergonomics	20
19	8-May-05	Production control	21
		Production control	21
20	15-May-05	Robotics, CNC	21
		Review	
	22-May-05	FINAL EXAM WEEK	

MECH 1210

LAB AND SHOP SAFETY

Jan-03

The machine shop and labs used for MECH 1210 can be very dangerous if proper procedures are not followed. As working shops, they are subject to the rules and regulations of the Workers Compensation Board as well as BCIT policies and regulations. In part, this includes:

1) Students may not use shop tools and equipment unless an instructor is present and has given permission.

2) While in the shops, students must obey the instructions of any shop instructor.

3) Approved safety footwear (CSA "green triangle") must be worn in the shops. Students will not be allowed to use the shops without approved footwear, and there will probably not be time to make up missing sessions if they forget to bring it.

4) Eye protection must be worn in the shops. Some safety glasses and face shields are available in the shops, but it is highly recommended that students purchase their own.

5) Clothing should be close-fitting and must cover arms and legs.

6) Do not touch machinery and equipment except as specifically directed as part of your lab exercise. There is a strong temptation to fiddle and play with knobs and levers while you are standing around, but this can be extremely dangerous to yourself and to other users. As a result of fiddling, machines may start up or move unexpectedly, plastics machinery can become dangerously hot, and so on.