MECH-463 Mechanical Engineering Project

Fall/Winter 2002-03

Project	Professor R. Edwards, MD 358, tel. 398-6285				
Advising	Office Hours: Tuesday, Thursday pm by appointment				
Team	Professor D. May, MD 358, , tel. 398-6285				
	Office Hours: Thursday pm by appointment				
	Professor R. Mongrain, tel. 398-1576, office: MD 364				
	Office hours: TBA				
	Design Engineer A. Morozov, PhD, Office hours: TBA				
	Professor P. Radziszewski, tel. 398-6282, office: MC 120				
	Tuesday: 1:00 – 3:30 pm, Thursday, 2:30-3:30 pm				
	(all e-mail communication must be through the course WebCT site)				
Lectures	Tuesday and Thursday, 1:05-2:25 pm				
Prerequisites	MECH-292 Design 1, MECH-393 Design 2				
Recommended Text	Dieter, G.E., Engineering Design, 3 rd ed., McGraw Hill, 2000.				
Required Notebook :	Design Notebook, McGill Bookstore				

Course Objective & Description

Objective: Design, build, and deliver a working prototype as specified by a client.

<u>Description</u>: Before graduation, McGill students must demonstrate that they can apply their education to solve practical engineering problems. The nature of this course is characterized as a team project work involving design, fabrication, performance-testing and application of a real-world mechanical device/system or experimental facility. The project work will be complemented by a scheduled set of lectures, workshop topics and seminars in the Fall term on topics related to the general field of engineering design. This is a two-semester project course. Students will select their own project teams in the first class or two, and teams will be able to request projects that interest them, from a list of supported projects. Each project team will have a project advisor to provide guidance and participate in grading.

Academic Integrity Statement

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/integrity for more information).

Learning Outcomes

I. Specific :

- a) Define the design problem,
- b) Gather pertinent information regarding conceptual design,
- c) Generate design concepts,
- d) Evaluate concepts and determine solution to be developed,
- e) Determine solution layout and proceed with embodiment design,
- f) Complete detail design,
- g) Build working device.

II. General :

- i) Demonstrate team work skills,
- ii) Demonstrate project management skills,
- iii) Demonstrate communication skills (written/oral),
- iv) Value the central role of design in engineering design,
- v) Demonstrate competence in applying design methodology.

Course Evaluation and its Relationship to the Learning Objectives

	Evaluation Tool	Due	Value	Objectives		
1. Invited Lecture Series (fall term only)						
Quizzes		-	a/10	II iv		
2. Team Activities						
	Project Attribution (<u>DAN-2</u>)	Sept. 9 th	-	// i, ii, iii		
	Team Commitment (<u>DAN-3</u>)	Sept. 9 th	-	// i, ii, iii		
Team Advisor	Problem Statement (<u>DAN-4</u>)	Sept. 23 rd	b/5	<i>I</i> a, b; <i>II</i> ii, iii		
Engineer	Detailed Drawings (DAN-5)	Dec. 2 nd before 4 pm	c/15	<i>I</i> f; <i>II</i> ii, iii		
PD Team	Final Report (<u>DAN-6</u>)	Jan. 30 th before 4 pm	d/25	<i>I</i> a to f; <i>Ⅱ</i> ii, iii, v		
PD Team	Design Oral Presentation (DAN-7)	Week of, March 7 ^{th*}	e/10	I a to f; Ⅱ i to iii, v		
PD Team	Exhibition Presentation (<u>DAN-8</u>) - poster & abstract	April 6 ^{th *} all day	f/7	l a to g; ll i to iii, v		
PD Team	Working Prototype (<u>DAN-9</u>)	April 6 ^{th *} all day	g/25	I g; II ∨		
	Client Evaluation (DAN-10)	April 6 th *	h/3	I a to g; Ⅱ i to iii, v		
3. Individual Contribution						
	Design Notebook (<u>DAN-1</u>)	March 31 st before 4 pm	j/40	/ a to f; // i, ii, iii, ∨		
	Peer Evaluation #1 (<u>DAN-11</u>)	Dec. 2 nd	k/10	// i, ii		
	Peer Evaluation #2 (DAN-11)	March 31 ^{st **}	l/10	// i, ii		
	Advisor's Evaluation (DAN-12)	April 7 th *	m/20	<i>I</i> a to f; <i>II</i> i, ii, iii, v		

* date to be confirmed,

** inform the team Advisor, if evaluation changes by April 7th.

The Advisor's Role

The measure of success of a given project is the exclusive responsibility of the student team.

As such, the role of the Advisor should be seen as one of a senior engineer mentoring the work of a team of junior engineers with the objective to contribute to the development of engineering autonomy of these individuals. The appropriate role of the Advisor is, not so much as to answer specific questions regarding a given project or problem or for that matter determine what and when to do something, but to insure that public safety issues are addressed, ask critical over-looked questions, critique engineering calculations and their translation into engineering specifications and eventually drawings, critique project advancement and *particularly evaluate individual team member contributions to the overall team success*.

Grade Attribution

Based on the evaluation tool values above, the individual numerical grade total, G_t , will be determined as follows:

$G_t = a + I_c * (b + c + d + e + f + g + h)$

where the individual contribution factor, I_c , is determined by the Advisor (DAN-12) and is based on the design notebook (DAN-1), the peer evaluation (DAN-11) and the advisor own evaluation of the individual team members (DAN-12).

The average of all individual contribution factors for a given team can be equal or less than 1 especially if a team member's involvement and performance has been shown to be sufficiently poor as measured by the evaluation tools illustrated above.

It should be noted that of all the team activities presented above, only the Problem Statement (DAN-4) will be evaluated by the Team Advisor. All the Detailed Drawings (DAN-5) will be evaluated by the Project Advising Team's inhouse engineer. The remaining activities will be evaluated by members of the Project Advising Team not directly advising a given team.

Grading Scale **

Letter grades*** will be assigned using the numerical grade total as follows:

A	85-100	В-	65-69
A-	80-84	C+	60-65
B+	75-79	С	55-59
В	70-74	D	50-54
N 1	- los el le		

*** Numerical values are rounded.