Taller 2
El Sílabo del Curso:
La Planificación de Cursos con Enfoque de Enseñanza Centrada en el Estudiante

Supplemental Handouts

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Sample Learning Outcomes

Engineering

1. Calculate lift and drag for blimps and airfoils.
2. Use lift and drag calculations to evaluate aerodynamic vehicle performance.
3. Design an internal structural configuration for simple trusses, beams, columns, and shafts in order to meet specified leading and deformation criteria.
4. Explain at a level understandable by a non-technical person how jet propulsion works.
5. Create models of inviscid, steady fluid flow over simple profiles and shapes.
6. Explain the division of the resistance of a ship into its components.
7. Distinguish emissions from combustion characteristics.
8. Create interactive 3-D models of products and environments using VRML.
9. Conduct a heat balance over a conventional steam power plant.
10. Analyze the relationships among the properties, structures, heat treatment, and load for metals.
11. Be aware of typical properties and applications for common kinds of alloys.
12. Analyze the factors that cause metals to disintegrate in humid environments.
13. Distinguish emissions from combustion characteristics in at least three ways.

Business

14. Analyze and evaluate different planning techniques.
15. As a part of a panel, judge if proposals to modification or proposals to new usages are a) possible, b) suitable, and c) outstanding.

Mathematics

16. Draw conclusions about the solvability of a system of linear equations using determinant and rank of a matrix.
17. Solve geometric problems concerning lines and planes using vectors.
18. Choose a basis for the plane or the space suitable for a specific geometric problem.
19. Solve a system of linear equations using matrix inverse and matrix calculations.

Communication

20. Communicate effectively in oral, written, and graphic forms in Spanish and in English.

Teamwork

21. Demonstrate responsibility and integrity in project work that involves teams.

Professional Practice

22. Apply the knowledge and skills of one’s profession in an effective and efficient manner.
23. Take a leadership role in the solution of complex technological problems, both in university and professional situations.

Rating Form: Oral Presentations and Technical Briefings

Presenter: Team: Date:
Course Number and Name: Type of Presentation:
Evaluator(s):

NA = Not Applicable

	Poor	**Fair**	**Good**	**Excel-lent**	**NA**
PRESENTATION QUALITY					
Main objective of presentation is clearly stated.					
Presenter maintains good eye contact with the audience.					
Presenter uses voice effectively (volume, clarity, inflection).					
Presenter is poised and professional (appearance, posture, gestures).					
Transitions to the next presenter are smooth and effective.					
Comments on presentation skills					
TECHNICAL CONTENT					
Technical content is accurate and significant.					
Technical content shows sufficient development.					
Main points are emphasized and the relationship between ideas is clear.					
Ideas are supported with sufficient details and clear drawings.					
Graphics and demonstrations are effectively designed and used.					
Alternatives are presented with a rationale for those selected.					
Key issues are addressed.					
Questions are answered accurately and concisely.					
Comments on technical competence					

OVERALL:

Rating Form: Design Project Assessment

Student Name: _____ Date:_____
Evaluator(s):_____
Course Number and Name_____ Team:_____

The student demonstrated the following knowledge, skills, and attitudes:	Not at All	To a Limited Extent	To a Moderate Extent	To a Great Extent	To a Very Great Extent
Knowledge of Underlying Sciences (CDIO 1.1) Applies mathematics to the analysis of final design**.** Applies knowledge of science (physics, biology, and/or chemistry) to the analysis of final design.					
Engineering Reasoning and Problem Solving (CDIO 2.1) Applies logic in solving problems and analyzes problems from different points of view. Translates theory into practical applications using appropriate technical techniques, processes, and tools.					
Experimentation and Knowledge Discovery (CDIO 2.2) Uses computer-based and other resources effectively thus acquiring information from multiple sources. Organizes and interprets data appropriately. Designs and conducts experiments to validate theories					
System Thinking (CDIO 2.3) Understands how events interrelate and demonstrates an ability to take new information and integrate it with past knowledge from various courses, to solve technical problems.					

Creative Thinking (CDIO 2.4.3) Suggests new approaches and challenges the way things are normally done. Develops many potential solutions to problems while discouraging others from rushing to premature conclusions.					
Lifelong Learning (CDIO 2.4.6) Learns independently and continuously seeks to acquire new knowledge. Exceeds basic requirements of an assignment and brings in relevant outside experiences to provide advanced solutions to the problems at hand.					
Teamwork (CDIO 3.1) Contributes a fair share to the completion of the project. Participates, listens, and cooperates with other team members. Shares information and helps reconcile differences of opinions when they occur.					
Communication (CDIO 3.2) Articulates ideas in a clear and concise fashion and uses facts to reinforce points.. Plans and delivers oral presentations effectively. Uses technology and graphics to support ideas and decisions. Addresses questions and issues raised during the oral presentation. Written materials flow logically and are grammatically correct					
Conceiving (CDIO 4.3) Sets system goals and requirements. Defines function, concept, and architecture. Develops a realistic cost estimate to implement the design, Uses rational, objective reasoning to arrive at final design among alternatives.					
Project Management (CDIO 4.3.4) Sets goals, prioritizes tasks and meets project milestones. Seeks clarification of task requirements and takes corrective action based upon feedback from others. Creates action plans and timetables to complete assigned work.					

Designing (CDIO 4.4) Substantiates performance of final design and its elements in an objective manner and does not make unsubstantiated claims. Assesses the environmental impacts of the final design in a realistic manner. Assesses economic, social and political impact of the final design. Suggests ways to extend and improve design					

Comments:

Based on the work of McGourty, J., Sebastian, C., & Steward, W., *Gateway Coalition Freshman Design Project Faculty Review – Final Report*. See http://www.gateway.org
Adapted for *The CDIO Initiative* by D. R. Brodeur, dbrodeur@mit.edu, March 1, 2006.

Teamwork Assessment

Name _____
Course _____ Date _____
Rate your teammate using this scale:

R = Rarely **S** = Sometimes **O** = Often **A** = Always

Technical Contributions	**R**	**S**	**O**	**A**	**Comments**
Has requisite technical knowledge					
Pays attention to accuracy of details					
Contributes good ideas					
Understands the overall project					
Effectively troubleshoots problems					
Knows how to find answers					
Collaboration	**R**	**S**	**O**	**A**	**Comments**
Attends team meetings					
Produces work on schedule					
Effectively takes charge of tasks					
Willing to take on tasks					
Willing to help others					
Communicates clearly with team					
Informs other teams of progress					
Listens to other points of view					
Accepts advice about his/her work					
Gives criticism constructively					

Describe your colleague's major technical contributions to the project:

Identify your colleague's major strength(s) as a team member

Suggest one or two areas that need improvement

Overall rating of collaboration (circle one): **Poor** **Fair** **Good** **Excellent**

03/08/04 -- Department of Aeronautics and Astronautics -- Doris R. Brodeur, Ph.D.- dbrodeur@mit.edu

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Self-Assessment of Current Skills and Abilities

How would you rate your current skill and ability to …	**Very Poor**	**Poor**	**Adequate**	**Good**	**Very Good**	**Excellent**
Apply mathematics and physics in the solution of engineering problems						
Apply the principles of core engineering fundamentals						
Demonstrate deep working knowledge of aerospace engineering						
Formulate and solve engineering problems						
Conduct inquiry and experimentation						
Apply statistics, probability, and uncertainty analysis in experiments						
Recognize the importance of the societal context of engineering						
Work successfully in different cultures and organizations						
Conceive and design complex aerospace systems						
Implement and operate complex aerospace systems						
Lead and work in multidisciplinary teams						
Communicate effectively in writing and in oral presentations						
Demonstrate an understanding of professional ethical responsibility						
Use initiative and creativity in the solution of engineering problems						
Practice effective time management						

MIT Aeronautics and Astronautics
Subject Evaluation Form

Subject Number and Title: _____

Term/Year_____

SD = Strongly Disagree **D** = Disagree **N** = Neutral **A** = Agree **SA** = Strongly Agree

The Subject	**SD**	**D**	**N**	**A**	**SA**
Subject learning objectives are clear.					
The subject is well organized.					
The subject stimulates my interest to learn more.					
The subject is relevant.					
Feedback about my work is helpful.					
Grading criteria are fair.					
I am achieving the subject learning objectives.					
The overall quality of this subject is good.					
Instructor 1 *(name)*_____	**SD**	**D**	**N**	**A**	**SA**
gives clear explanations.					
maintains a pace that is (too slow -- just right -- too fast)					
encourages me to take an active part in my own learning.					
is available outside of class to answer questions.					

Overall, the instructor contributes to my learning.					
Instructor 2 *(name)*_____	**SD**	**D**	**N**	**A**	**SA**
gives clear explanations.					
maintains a pace that is (too slow -- just right -- too fast)					
encourages me to take an active part in my own learning.					
is available outside of class to answer questions.					
Overall, the instructor contributes to my learning.					
Instructor 3 *(name)*_____	**SD**	**D**	**N**	**A**	**SA**
gives clear explanations.					
maintains a pace that is (too slow -- just right -- too fast)					
encourages me to take an active part in my own learning.					
is available outside of class to answer questions.					
Overall, the instructor contributes to my learning.					

What is the average number of hours you actually spend *each week* in this subject?
(Round to the nearest whole number.)

_____ hr. Lecture . _____ hr. Lab
_____ hr. Recitation _____ hr. Homework
_____ hr. With faculty advisor _____ hr. With teaching assistants or tutors

(over)

How effective are these *teaching and learning strategies* in helping you achieve the learning objectives in this subject? (If the strategy is *not* used in the subject, check *Strategy Not Used*.)

Teaching and Learning Strategies	**Not at all Effective**	**Generally Ineffective**	**Generally Effective**	**Very Effective**	**Strategy Not Used**
Lectures					
"Muddiest part" cards					
Concept questions with PRS					
In-class group discussion					
Recitations					
Prepared lecture notes					
Subject web page					
Lab projects					
Term projects					
Working in teams					

How effective are these *assessment strategies* in measuring your learning in this subject? (If the strategy is *not* used in the subject, check *Strategy Not Used.)*

Assessment Strategies	**Not at all Effective**	**Generally Ineffective**	**Generally Effective**	**Very Effective**	**Strategy Not Used**
Quizzes and exams					
Oral exams					
Homework and problem sets					
Peer assessment					
Lab notebooks					
Oral reports					
Written reports					

What are the best parts of the subject?

What would improve the subject?

Other comments:

MIT Department of Aeronautics and Astronautics
Reflective Memo for 2005 - 2006

Subject _____ Semester _____
Instructor(s) _____

Learning Objectives

1. What are the learning objectives (expressed as measurable outcomes) for this subject?
2. To what extent were you able to integrate the CDIO skills specified for this subject in the Curriculum Plan of 2002 (please fill in attached table)?

Teaching & Assessment Methods

3. What teaching and assessment methods did you use and what evidence indicates these methods were successful or not?

Student Learning

4. How well did the students perform on each subject learning objective? (Where possible, make reference to specific data to support your conclusion.)

Continuous Improvement

5. What actions did you take this semester to improve the subject as a result of previous reflections or input from students or colleagues?
6. What did you learn about your teaching and assessment methods this semester?
7. What actions do you recommend to improve this subject in the future?

Information Sharing

8. To whom have you forwarded this reflective memo?

Attachments : subject syllabus

Programa Sobre Diseño de un Currículo Basado en Resultados de Aprendizaje
Agosto 2009

Selected References for Workshop #2

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