

University of Nevada, Reno
Departments of Electrical Engineering
and
Mechanical Engineering

EE491/MECH452
A Special Inter-Disciplinary Class for Senior
Electrical and Mechanical Engineering Students
on Innovation and Entrepreneurship

UNIVERSITY OF NEVADA

Reno

**LEMELSON CENTER FOR
INVENTION, INNOVATION
AND ENTREPRENEURSHIP**

**ELECTRICAL ENGINEERING DEPARTMENT/260
COLLEGE OF ENGINEERING
UNIVERSITY OF NEVADA, RENO
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University of Nevada, Reno
Departments of Electrical and Mechanical Engineering
Reno, NV 89557-0153

EE491/MECH452

A Special Inter-Disciplinary Class for Senior
Electrical and Mechanical Engineering Students
on Innovation and Entrepreneurship

Spring Semester 2000

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EE 491 - ENGINEERING DESIGN/ANALYSIS
MECH 452 - DESIGN SYNTHESIS
SPRING SEMESTER 2000

1999-2000 CATALOG DATA

EE 491 ENGINEERING DESIGN/ANALYSIS (4+0) 4 CREDITS
Innovation, entrepreneurship and design of products. Proposal writing and design and fabrication procedures used by industry. Prerequisites: EE 321, 336, 490. For electrical engineering majors only. (MAJOR CAPSTONE COURSE) ABET DESIGN CREDITS = 4

MECH 452 Creation and optimization systems using Computer-Aided Design (CAD) facilities. Economic aspects are included. Prerequisite: MECH 351. (Major capstone course)

TEXTBOOKS:

- (1) STOLZE, W.J. (1999), "STARTUP: AN ENTREPRENEUR'S GUIDE TO LAUNCHING AND MANAGING A NEW BUSINESS", CAREER PRESS, 1999, 5th EDITION, ISBN 1-56414-2423
- (2) STOLZE, W.J. (1997), "STARTUP FINANCING: AN ENTREPRENEUR'S GUIDE TO FINANCING A NEW OR GROWING BUSINESS", CAREER PRESS, 1997 ISBN 1-56414-271x

REFERENCES:

- (1) BANDROWSKI, J.F. (1990), "CORPORATE IMAGINATION PLUS - FIVE STEPS TO TRANSLATING INNOVATIVE STRATEGIES INTO ACTION", THE FREE PRESS - A DIV OF MACMILLAN PUBLISHERS, NEW YORK. ISBN 0-02-901501-4
- (2) BIGGS, D. (1995) "DEFINING, DESIGNING AND LAUNCHING MARKET AIMED PRODUCTS", DOGWOOD PUBLISHING CO., MARIETTA, GA, ISBN 0-9621118-8-0
- (3) MacVICAR, D. and D. THRONE (1992) "MANAGING HIGH-TECH START-UPS", BUTTERWORTH-HEINEMANN, BOSTON ISBN 0-7506-9247-2

SUMMARY

This is a very demanding class. The students are separated into companies with no more than six persons in each group. The companies can earn a maximum of 10,000 points allocated as follows:

Week	Task	Max. Points
1,2,3,4,5	Prepare written proposal and present to class	2,000
6,7,8,9,10	Order materials, breadboard system, consider design problems and packaging of final product, progress reports 1,2.	3,000
11,12	Breadboard complete, prepare final engineering drawings for finished product.	2,000
13,14	Complete project, prepare final report, or IEEE paper.	1,000
15	Present completed project to faculty and invited guests	<u>2,000</u>
	Total	10,000

EE 491 - ENGINEERING DESIGN/ANALYSIS
 MECH 452 - DESIGN SYNTHESIS
 SPRING SEMESTER 2000

NOTE: 11-12 FRIDAY ARE TO BE USED BY STUDENTS TO WORK ON THEIR PROJECTS

Points	Week	Date	Time	Activity
2000	1	1/19	11	First class introduction by Dr. Kleppe
		1/21	1-5	Lecture on writing proposals and how to order parts.
	2	1/24	11	Special Film
		1/26	11	Special Film
		1/28	1-5	Lecture on financial statements and fiscal reporting requirements for a company, Mr. Larry Mace, Grant Thornton.
	3	1/31	11	Job Search and Employment Strategies - Pru S. Jones - UNR Career Development Center
		2/02	11	Job Search and Employment Strategies - Pru S. Jones - UNR Career Development Center
		2/04	1-5	The innovation process and the development of new products - Kleppe
	4	2/07	11	"Managing High Tech Start-Ups" - Darwin Throne, author and small business entrepreneur.
		2/09	11	Written proposals due, present oral (Two classrooms)
		2/11	1-5	Written proposals due, present oral
	5	2/14	11	"Money, Banking, and Venture Capital", Mr. Richard Deglman, Senior Vice President, Pioneer Citizens Bank.
		2/16	11	NO CLASS - Work on projects
		2/18	1-5	Special lecture by an experienced entrepreneur, some case histories, Darren McBride - Sierra Computers, Inc.

University of Nevada, Reno
 Electrical Engineering Department
 EE 491/ MECH 452 - Project Schedule of Events
 SPRING SEMESTER 2000

<u>Points</u>	<u>Week</u>	<u>Date</u>	<u>Time</u>	<u>Activity</u>
3000	6	2/21	11	NO CLASS - PRESIDENT'S DAY
		2/23	11	Mr. Rich Minetto - Energy Source, LLC "Engineering Ethics."
		2/25	1-5	Submit Progress Report #1 and make oral presentations
	7	2/28	11	Mr. Steve Schneiderman, Senior VP, Miller Freeman Inc., "Guerrilla Marketing For Entrepreneuers".
		3/01	11	Lecture by Mr. David Mallery, Hewlett Packard, on the design and development of products for local area networks and what it is like to work for a large company
		3/03	1-5	Lecture on product liability - Mr. Ross Hill
	8	3/06	11	Mr. Don Costar - Inventing
		3/08	11	Mr. Bryan Leipper - How to Start and Run a Consulting Business
		3/10	1-5	Lecture on Patents, Copyrights and Trademarks. - Mr. Warren Kujawa, San Francisco
	9	3/13	11	"Technology and Business Development" - Mr. Jim Kubinec - Acuitive Inc.
		3/15	11	Lecture on Starting a Business using venture capital Mr. Bob Wang, Chairman, R2 Technology
		3/17	1-5	Submit written Progress Report #2 and make oral presentations. Last day to order parts. NO EXTENSIONS ARE ALLOWED.
10	SPRING BREAK 3/20/2000 - 3/24/2000			

University of Nevada, Reno
 Electrical and Mechanical Engineering Departments
 EE 491/ MECH 452 - Project Schedule of Events
 SPRING SEMESTER 2000

Points	Week	Date	Time	Activity
2000	11	3/27	11	Experiences with Starting and Managing a High Technology Company - Mr. Tom Potter, Reno Agriculture and Electronic Inc.
		3/29	11	NO CLASS - Work on projects
		3/31	1-5	Lecture by Dr. Paul MacCready - Chairman of AeroVironment, Inc., United States Inventor of the Year and recipient of many other awards
	12	4/03	11	Product Design for Safety and Product Liability - Mr. Larry Morgan, Black & Decker Company
		4/05	11	NO CLASS - Work on projects
		4/07	1-5	Lecture by Mr. Dave Biggs on the methodology of product development
1000	13	4/10	11	Small Business Innovation Research (SBIR) Program, past, present and future - Kleppe
		4/12	1 - 5	NO CLASS - Work on projects
		4/14		Lecture on translating innovation strategies into action - Mr. Jim Bandrowski - Author of "Corporate Imagination - Plus"
2000	14	4/17	11	What to expect when you graduate - Mr. Mark Looney, UNR Grad.
		4/19	11	NO CLASS - Work on projects
		4/21	1-5	Submit final written report, oral presentations
2000	15	4/24	11	NO CLASS - Work on projects
		4/26	11	NO CLASS - Work on projects
		4/28	11	Oral presentation of completed projects to faculty and invited guests

University of Nevada, Reno

**EE491 / MECH 452
Proposal Evaluation Sheet**

Company Name: _____

Date: _____

Maximum
Points

Actual
Points

Format: The proposal should be neat, well organized and easy to read.

100

Technical Background and Significance of the Problem or Opportunity:

Make a clear statement of the significance of the specific technical problem or opportunity addressed. This section also should provide a thorough discussion of the technical background of the stated problem or opportunity. It is in this discussion that management determines the extent of the proposers knowledge in this area.

100

Objectives: Briefly outline (a) the specific objectives of project, (b) technical approach the to be used in solving the problem or developing the product and (c) the anticipated results of the project.

100

Research or Product/Process Development Plan: This is the principal part of the proposal. The research plan should include in narrative form a (1) technical discussion of the problem or opportunity and (2) discussion of how this research or R&D will achieve major benefits in terms of significant research results, improved products or processes, or in solving important technical problems which could substantially reduce costs or improve performance. Where possible, the methods and task to be performed should be outlined in logical sequence and explained in detail. Do not assume the reviewer will fill in the gaps in your logic.

100

Be candid and state where problems exist and additional work may be needed to prove your idea or innovative approach. Incremental improvements are not the objective of the EE 491/MECH 452 program. High-risk innovations are. Factual rather than promotional information is requested.

Related Research or Product Development: Describe significant, recently completed or current research, product development or success that (a) you have achieved in the field and (b) others have achieved that is directly related to the proposed effort. Describe how this relates to the proposed effort and why your effort is different. You must demonstrate a knowledge of state-of-the-art R&D in your project area. The proposer should include a current bibliography of directly relevant technical literature that has been reviewed.

100

Key Personnel: Identify key personnel and describe directly related education and experience.

100

Facilities: Describe the relevant instrumentation and facilities available or required to complete the research or product development.

100

Budget: Include a budget that estimates the R&D costs and provides some market projections for expected revenues from the product development effort.

100

Oral Presentation: Should be no more than 10 minutes, well organized and use visual aids where needed.

200

Totals: 1,000

Final Points Awarded: _____

Comments by Management:

- 1) Proposal is: Accepted
 Rejected

- 2) Reasons for action

Dr. John Kleppe

Dr. Eric Wang

TEAM MEMBER EVALUATION FORM

COURSE : _____

SEMESTER : _____

TEAM# : _____

PROJECT : _____

YOUR NAME : _____

1. The efforts of any one member of your group are to be compared to *the average effort* put forth by all of the members of the group. This average is a score of 100. If everyone is equal, everyone gets 100.
2. Write the names of your group members INCLUDING YOURSELF in alphabetical order by last name:

A. _____	E. _____
B. _____	F. _____
C. _____	G. _____
D. _____	
- 3 - For each statement below, determine the score which each group member, *including yourself*, should receive and enter the appropriate number in the blank provided. Scores usually range between 80 and 120 (80 = 80% of the group average, 120 = 120% of the group average, etc.) but may be higher than 120 or lower than 80. (Note: for each statement, *the scores must average 100 going across each row*. To insure this please check to see that the total of the scores for each row is equal to the number of people scored multiplied by 100.)

ITEM	ELEMENT	A	B	C	D	E	F	G	Row Total
1	Was on time for group meetings and stayed for the duration.								
2	Coordinated his/her schedule with the group so meetings were easy to plan.								
3	Contributed to development of the group's plan work.								
4	Met task deadlines that were set by the group.								
5	Contributed useful ideas to the group's work.								
6	Analyzed and critiqued other group members ideas.								
7	Helped the group stay organized and progress toward its goals.								
8	Contributed positively to group camaraderie.								
9	Made significant contributions to the group's written report.								
10	Made significant contribution in preparing or delivering the group's presentation.								
	Total score for each person: Add down the column.								
	Average score for each person: Divide the total score by 10.								

University of Nevada, Reno
EE 491 / MECH 452
Personnel Evaluation Form

This form is to be used by each EE 491 / MECH 452 company president to evaluate personnel within his/her company.

Company Name: _____

Evaluator: _____

Date: _____

General Evaluation Concerning:

First

Middle

Last

Note: If you are not knowledgeable about a trait(s) - leave blank

Rating of General Attributes:	Excels	Good	Average	Fair	Poor
Ability to Express Self					
Judgment					
Cooperation					
Creativity					
Initiative					
Reliability					
Enthusiasm					
Technical Ability					

I have read this evaluation and:

AGREE

DO NOT AGREE

Signature of person being evaluated: _____ Date: _____
(Must be signed to be valid.)

EE 491/MECH 452 BUSINESS LICENSE APPLICATION

Company Name: _____

All participating employees need to be listed below. Their name, title, phone number, and signature must be included for consideration.

NAME: _____
TITLE: _____
PHONE NUMBER: _____
EMAIL: _____
SIGNATURE: _____

NAME: _____
TITLE: _____
PHONE NUMBER: _____
EMAIL: _____
SIGNATURE: _____

NAME: _____
TITLE: _____
PHONE NUMBER: _____
EMAIL: _____
SIGNATURE: _____

NAME: _____
TITLE: _____
PHONE NUMBER: _____
EMAIL: _____
SIGNATURE: _____

NAME: _____
TITLE: _____
PHONE NUMBER: _____
EMAIL: _____
SIGNATURE: _____

NAME: _____
TITLE: _____
PHONE NUMBER: _____
EMAIL: _____
SIGNATURE: _____

EE 491/MECH 452

Company Name: _____

President: _____

Project preferences: list first 5 choices by number in order of preference or write in your own idea.

1. _____

2. _____

3. _____

4. _____

5. _____