

EK156 DESIGN AND MANUFACTURE
SPRING 2013
COURSE SYLLABUS

Prof. T. A. de Winter, Office: 15 St. Mary's Street, Room 138

Phone: (617) 353-9893(office), (603) 878-2760(home)

FAX: (617) 353-5548, e-mail tdw@bu.edu

Office hours: Monday and Wednesday 7-8AM, 2-4PM

Tuesday 7-11:15AM, 1-4PM

Friday 7:00-11:15AM

Text: Groover, Fundamentals of Modern Manufacturing, 5th edition, Wiley
ISBN 0-471-74485-9

Classroom: 8 St. Mary's Street, Room PHO 211

Time: Friday, lectures: Group B 1:00-2:00PM, Group A 2:00-3:00PM

Friday, lab demos: Group A 1:00-2:00PM, Group B 2:00-3:00PM

Agganis Arena: Section 112, Row Q, seat 2

Prof. Peter Zink, pzink@bu.edu

Grad. Teaching Fellow: Jeff Mattson, jmattson@bu.edu

Grader: Carola Houttuijn Bloemendaal, carfrahb@bu.edu

Laboratory and Machine Shop Staff:

Joe Estano, Senior Supervisor, jestano@bu.edu

Office: Room 110, 110 Cummington St., 617 353-6653

Bob Sjostrom, Senior Specialist, Sjostrom@bu.edu

Office: Machine Shop, Basement, 750 Comm. Ave. 617 353-4246

David Campbell, Laboratory Engineer, dcampbel@bu.edu

Room 108, 110 Cummington St. 617 353 3952

Kara Mogensen, Laboratory Supervisor, karam@bu.edu

Room EMA 307, 730 Comm. Ave. 617 353-1565

Ryan Lacy, Automation Lab Coordinator, lacy@bu.edu

Room EMA 215, 730 Comm. Ave. 617 352-4274

The format of the course will consist of a 1 hour lecture each Friday, and a laboratory demonstration. Attendance will be taken at both the lectures and the demonstrations. The locations of the demonstrations and the membership of each group of students for each demonstration will be announced. In order to be effective, the lab demo groups will be about 10 students each.

Boston University has an honor system, and the work you submit for grading is expected to be your own. On your exams you will be required to affirm that the work you are submitting is your own by signing a short statement to that effect, a copy of which is shown on the attached typical exam cover. While the homework doesn't require an individual statement like the exams, it is expected to be your own work.

The following pages detail the grading, the reading assignments and the lecture and lab demo schedules for the semester.

EK156 DESIGN AND MANUFACTURE SPRING 2013

Think about it, if your project turned out exactly as you planned and budgeted it, if the design was not modified, if the materials were purchased in exactly the quantities you planned, if their cost estimates were "dead on" and if every step was carried out as scheduled, you wouldn't have to write a final project report because all you would need is a new title page for your proposal.

While we cannot simulate raises in salary or promotions (or terminations) which accompany success or failure in industry, it is important to have your eye on the big picture.

If, when employed as an engineer in industry, your boss calls you into her office and tells you that an important customer has asked your company to prepare a proposal and she is putting you in charge of preparing that proposal. In general it takes an officer of the company to sign such a proposal, and you will have to convince that officer that the company can successfully complete the project, by meeting the schedule and the specifications and make a profit while having a good chance to beat the competition with your price. If you succeed in convincing the officer of all that, the proposal will be sent out to the customer containing the following statement (in much greater detail of course):

"Our company will furnish all materials, labor, subcontracts and facilities in order to design, manufacture, test, deliver and install the product to your specifications, and guarantee its performance, on or before the delivery date at the quoted price"

Weeks later you are called into your boss's office again, and when you walk in she says: "I have good news and I have bad news". Without waiting which you would like to hear first, she informs you of the good news, "the company got the job thanks to the proposal you prepared, congratulations". While you are wondering what could possibly be the bad news, it is not long in coming. "You said we could do it, prove it", she adds, "it is your baby".

If you complete that project, "ON SCHEDULE, TO SPECIFICATIONS AND WITHIN BUDGET", your next assignment will be more important. It will be more important to your company, and not incidentally to your career.

The EK156 project is intended to give you a taste of this process and to familiarize you with the design process and with methods of manufacturing, hence the course title: DESIGN AND MANUFACTURE.

In industry, team projects usually require a division of responsibility. Individual tasks are assigned to individual team members and regular meetings are held to monitor progress and to schedule and assign the next tasks.

While it would seem that simulating this type of efficiency should be encouraged in EK156 projects, it would detract from the experience that each team member is required to

get from the project and the course. To have one member do the proposal, while another member takes care of parts and materials and a third one schedules and witnesses the machining deprives each member from experiencing the entire project in all its significant phases.

Part of the importance of working in a team is to help coordinate the work and to be at meetings on time. This builds confidence in each member's commitment and dependability.

Each phase of the project is to have the participation of all the project group members. While some of this will be difficult if not impossible for the instructor to monitor,

One footnote on the proposal. The Mechanical Engineering Department holds an annual Design Portfolio Competition. The concept of a design portfolio is essentially a collection of work of which you are proud, which can be presented as evidence of your efforts during an interview for an internship or a full-time position. Keep this in mind when preparing your proposal for this course, that it can be a building block and a substantial start of your design portfolio.

While variety is expected in the project designs, projects involving weapons or games and devices to promote excessive drinking or other hazardous behavior will not be approved.

ALL PROJECTS MUST BE MACHINED AND ASSEMBLED IN THE MECHANICAL ENGINEERING MACHINE SHOPS. NO WORK ON ANY PROJECT MAY BE MACHINED IN ANY OTHER FACILITY, ON OR OFF BOSTON UNIVERSITY CAMPUS. THE USE OF THE IMAGINEERING OR "TINKER LAB" FOR ANY PART OF ANY COURSE PROJECT IS STRICTLY FORBIDDEN BY THE COLLEGE OF ENGINEERING. THIS OBVIOUSLY APPLIES TO EK156 PROJECTS.

EXCEPT AS A DISPLAY BASE FOR A PROJECT, WOOD IS NOT AN ACCEPTABLE MATERIAL FOR ANY EK156 PROJECT.

THE USE OF LAPTOPS IS NOT ALLOWED IN THE LECTURE OR THE DEMOS AT ANY TIME

EK156 DESIGN AND MANUFACTURE
SPRING 2013
COURSE WORK AND GRADING

An attendance sheet will be circulated in class each day. It is your responsibility to sign the sheet before the start of the next class in the classroom. Excessively and chronically late students may not get full credit for signing the attendance sheet after the end of the class. A separate attendance sheet will be used to record attendance in the laboratory demonstrations.

1. Homework: homework will be assigned, each to be completed in a week. The homework will be due at the start of class on Friday.
2. Project: In the course, in teams of two or three students you are required to design and build a project of your choice and to manage it as an engineering project in industry. The design has to be yours and the project must be built from scratch. The project should require 30 to 60 hours to design and build. Students are strongly urged to do a project using metal or plastics as building materials. Kits or commercially available designs are not acceptable.
3. Project Proposal: Written proposals for the projects selected are to be written and handed in according to the course schedule. Two copies of the proposal should be submitted, one for grading and return to the student, the second for the use of shop supervisory personnel.
4. Project Report: After the completion of the project, a project final report will have to be submitted. It should clearly show the differences, if any, in schedule, cost, function and appearance, between the project as built, and the originally proposed version.
5. Work Samples: Samples of the project proposal and report will be furnished to all students as a guide and model for their work.
6. Grading: The grade for the course will be based on 7 components, each carrying equal weight. They are: 1. Homework, 2. Project Proposal, 3. Exam #1, 4. Exam #2, 5. Attendance, 6. Final Project and 7. Project Report.
7. Drawings, Proposal and Report: In designing the projects, careful and detailed sketches are encouraged, and rewarded especially if done on Autocad, Solidworks or WILDFIRE or similar CAD software packages. All reports should be typed.
8. Incomplete grades; there will be none given.
9. Laboratory Demonstrations: In the weeks indicated in the schedule, laboratory demonstrations will be given on Fridays. Questions are encouraged during the demonstrations, some of the problems and questions on the exams will deal with material covered in the demonstrations.

EK156 DESIGN AND MANUFACTURE
FIRST EXAMINATION
December 7, 1941

NAME: _____

ID #: _____

PROBLEM	POINTS
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____
9	_____
10	_____

TOTAL	_____

STATEMENT

This examination is my own work. I have not had access to anyone else's solution or notes for this exam, nor have I given anyone else access to my exam solution or notes.* I have not collaborated or discussed this exam with anyone** and I have neither received nor given any help in solving the problems I am submitting for grading.

SIGNATURE

DATE

* Anyone handing in another student's exam is deemed to have had access to that exam, if you cannot hand in your own exam, consult the instructor for advice.

SIGNATURE
 EK156 DESIGN AND MANUFACTURE
 LAB DEMO SCHEDULE
 SPRING 2013

DATE

	Group I	Group II	Group III
JAN 25	MACHINING I BOB SJOSTROM	SOLIDWORKS PETER ZINK	DESIGN JOE ESTANO
FEB 1	DESIGN JOE ESTANO	MACHINING I BOB SJOSTROM	SOLIDWORKS PETER ZINK
FEB 8	SOLIDWORKS PETER ZINK	DESIGN JOE ESTANO	MACHINING I BOB SJOSTROM
FEB 15	NO LAB DEMOS, POWER POINT PROPOSAL PRESENTATIONS		
FEB 22	MACHINING II BOB SJOSTROM	CASTING KARA MOGENSEN	AUTOMATION RYAN LACY
MAR 1	AUTOMATION RYAN LACY TAKEHOME EXAM HANDED OUT, DUE MONDAY, MARCH 5	MACHINING II BOB SJOSTROM	CASTING KARA MOGENSEN
MAR 8	CASTING KARA MOGENSEN	AUTOMATION RYAN LACY	MACHINING II BOB SJOSTROM
MAR 22	WELDING KARA MOGENSEN	3-D PRINTING DAVID CAMPBELL	SOLIDWORKS PETER ZINK
MAR 29	SOLIDWORKS PETER ZINK	WELDING KARA MOGENSEN	3-D PRINTING DAVID CAMPBELL
APR 5	3-D PRINTING DAVID CAMPBELL	SOLIDWORKS PETER ZINK	WELDING KARA MOGENSEN
APR 12	MACHINING III BOB SJOSTROM PROJECT PRESENTATION 3-4PM	HEAT TREATMENT KARA MOGENSEN	MATERIALS TESTING DAVID CAMPBELL
APR 19	MATERIALS TESTING DAVID CAMPBELL	MACHINING III BOB SJOSTROM	HEAT TREATMENT KARA MOGENSEN
APR 26	HEAT TREATMENT KARA MOGENSEN	MATERIALS TESTING DAVID CAMPBELL	MACHINING III BOB SJOSTROM

LOCATIONS: ALL MACHINING DEMOS, BASEMENT, GCB 750 COMM AVE
WELDING AND CASTING DEMOS, ROOM 306, 730 COMM. AVE.
HEAT TREATMENT AND METALLOGRAPHY DEMOS, ROOM 308 "
SOLIDWORKS, ECL LAB, ROOM 125, 15 ST. MARY'S ST.
AUTOMATION: ADMS LAB 730 COMM. AVE. SECOND FLOOR
RAPID PROTOTYPING: BASEMENT, 110 CUMMINGTON ST
MATERIALS TESTING INSTRON ROOM 730 COMM AVE.

General Information

In order to bring current relevance to the teaching of engineering courses, to remain up-to-date on the state of the art of various technologies and to satisfy my own curiosity, I subscribe to and read(or scan) a number of publications. Some of these are available in my office for your use. If I am aware of the particular interests of some of my students, I look for and save copies of relevant, current articles about those interests. If you would like to indicate such interests to me on the appropriate line of your registration form for this course, I'll try to spot relevant articles and call your attention to them or provide you with copies for your use and information. Feel free to indicate your interest in a company, industry, technology, product line or one of the publications listed below. A partial list of publications follows.

Daily:

The New York Times
The Wall Street Journal
The Boston Globe
The Nashua Telegraph

Weekly:

Time	Fortune
Forbes	
Business Week	
Aviation Week*	

Monthly:

Popular Science*	Outdoor Life*
Popular Mechanics*	Field and Stream*
Technology News(MIT)*	American Rifleman *
Yachting*	Guns and Ammo *
Car and Driver*	
Automotive Industries*	
Manufacturing Engineering*	
Mechanical Engineering*	
Marine News*	
Maritime Reporter*	
Road and Track*	
Marine Technology*	

Sporadically:

The Times(London)	Trout and Salmon
Der Spiegel	La Nacion
International Herald Tribune	De Telegraaf
Bangor Daily News	

*Publications marked with an asterisk are routinely available in my office

1/14/2013

** with the exception of the instructor.

EK156 DESIGN AND MANUFACTURE
SPRING 2013

CLASS LIST REGISTRATION

Note: This information and statement simply confirm your intention to attend this course, and your understanding of the syllabus, the grading policy and the honor system. It is strictly for the use of the instructor and the teaching assistant in the course. This information is necessary to list you on the grade sheet for the course. Since the official class lists are not available until well after the start of the semester, and even then are not always complete, you cannot be sure of being on the grade sheet until you have submitted this information.

NAME: _____

ID#: _____

MAJOR: _____

TERM PHONE #: _____ *

e-mail address: _____ *

SPECIAL INTERESTS _____

* Listing your phone and/or e-mail address will allow us to get in touch with you in case of missed assignments or exams.

I acknowledge the receipt of the EK156 DESIGN AND MANUFACTURE syllabus for the SPRING 2013 Semester. I have read and I understand the grading policy and the dates of the exams. I have also read the sample exam cover and I understand the honor policy and the honor system statement which I am expected to sign with each exam in the course.
