

Introduction

The goal of the senior project is to produce the original product proposed and designed in Tech 190A. Tech 190A project resulted in a portfolio which included detailed work on the product's feasibility studies, specifications, analysis, evaluation and full documentation. The senior project also provides a capstone experience in design to meet an identified need or problem, from concept to fabrication and validation of the final product. In accomplishing this, students will familiarize with general industry practices as well as develop creative abilities in solving design problems. Teamwork skills in the design of products and understanding of professional practices, engineering ethics, as well as global and societal issues are developed.

Procedure

The new product production will be done with the same groups of students formed in Tech 190A. Adjustments may be made in some cases because of some unavoidable changes in design, processes, and/or group membership. Groups are encouraged to involve majors from different concentrations. Preferably, an ideal team should have two CENT and one or two Manufacturing Systems students. The project has both team aspects and individual aspects. Each individual team member has distinct responsibility to design, document, and produce the assigned product. Each team's product is expected to involve significant amounts of mechanical and electronic/electrical components. CENT students are expected to undertake all or most of the computer/electronics design, production and wiring, while Manufacturing Systems students are expected to do all or most of the mechanical work. A professionally-bound project report will be used to document the work as described below.

Project Schedule Plan Execution and Deliverables (90 Points = 36% of Course Grade)

There should be a detailed plan and specific deliverables for executing the project. The specifics include the following areas: comprehensive and functional project schedule; compliance to schedule; documented engineering (design), membership, or process changes; status reports; detailed log of meetings minutes; and availability of student for planned activities. These specifics and their available points are explained in more details in the following sections.

Comprehensive Project Schedule (10 Points): Groups should develop a detailed functional schedule that shows when and how they will execute the various activities of the project. This project schedule should be developed during the first group meeting(s) when the group should generate a working schedule that contains all expected group activities and the specific times the group should be working on them. This schedule should be developed in a responsible manner as it will be guiding all the activities of the group and contributes to the points allotted to the project. The schedule should be designed to align with the class

schedule provided. Failure to follow these schedules may result in lost points. Any adjustments made to the schedule should be reported to the instructor immediately. A corrected version should also be submitted immediately.

Compliance with Schedule (15 Points): Groups are expected to meet at least once every week to plan and discuss the progress of their projects. Instructor will also be observing these meetings and may attend any of them at any time. At these meetings, the instructor will be checking the progress and compliance of members to their schedules and will be issuing points accordingly.

Status Reports (20 Points): To keep up with the above schedule, instructor will be collecting weekly status reports from each group member. These reports should be a ½ - 1-page, double-spaced, typed documents that show what each member did the previous week toward the project, and are due as scheduled in the greensheet. Late, ill-prepared, unclear or too short reports will not be accepted.

Log of Group's Meetings (15 Points): Groups are expected to meet at least once every week. During the meetings, team member should take and keep detailed notes of their discussions, dates of meetings, and attendance to these meetings. These notes should be typed out and submitted to the instructor each week as scheduled. They should also be placed in the final report as evidence (log) of the meetings. Instructor will also be observing these meetings and may attend any of them at any time.

Documented Engineering, Membership, or Process Changes (10 Points): It is generally expected that there will be some changes to the original engineering design, group membership, process plan or other aspects of the project. These changes must be documented and submitted to the instructor within the first week of instruction. These documents must be in the forms of new or updated engineering drawings, wiring design reconfiguration, BOM, equipment and tooling list, process plans, assembly reconfiguration, membership list, and typed written reports with clear explanations of each of the changes made. Future changes must also be so reported within one week of their awareness. Unreported changes will deny the group the 10 points.

Availability of Student for Planned Activities (20 Points): Since scheduling is important in the successful completion of this project, student's availability is encouraged, to accomplish that. Students who cannot make a planned meeting must notify the instructor and their group members with prior written notices if they will not be in class for a day's activities. Such notices may substitute for their attendance if there is reasonable evidence to support their reasoning, but the students must also submit other deliverables that are due on such days to receive credit. A maximum of three (3) such notices will be allowed.

The instructor may drop a student from a group if there is sufficient evidence that such a student is not contributing enough or benefiting from the project.

Project presentation (10%)

Your group will be required to make a 15-20-minute formal oral presentation of your project during a block of time that will be earmarked for all class presentations. This presentation should include a display of the completed product, important visual aids or appropriate graphics in the form of posters to illustrate your product design and production activities. Each student will describe their undertakings and perform their relative demonstration to show how the system relates to their product. This is also an opportunity to show the class, guests and public your product.

Each group will display their product, graphics and posters during the poster presentation. Groups are encouraged to think of an appealing display that will raise attendees' curiosity and encourage them to ask more questions about their work. Attendees will include the college faculty and staff, SJSU students, industry advisory board members, and others who may be interested in your product ideas. The form of your poster will depend on the information you want to convey to the attendees and your goals in presenting the information.

Finished Product and Quality (20%)

Since the product is the center of all the project activities, it will contribute 20% of the grade for the class. It is expected that each team must produce one complete and finished product. Group members are expected to each produce their assigned parts. These parts must be assembled by the team members to form the completed product. The assembled product is expected to be functioning as designed.

Since grading of the finished product will involve both measurement and qualitative judgement, a good attention to details is key to scoring high on the finished product. Therefore, quality time invested in the production will normally translate into a quality product, which will generate a good score on the finished product. The product will be graded for quality: **completeness, specifications, finish, fit, burrs, dents, aesthetics, reliability, safety, healthy, application, functionality**, and so forth.

Reports (10%)

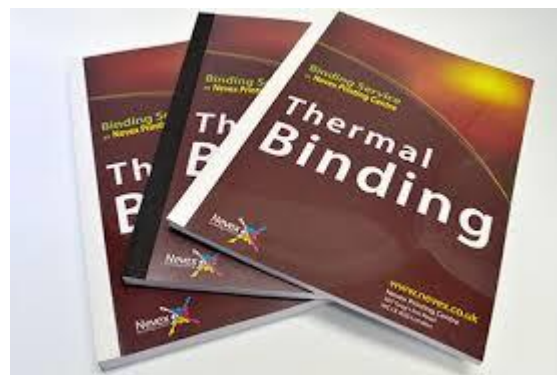
There will be two different reports that will together comprise the 10% score of the project report. They include a group introductory report and an individual report that will be prepared as follows:

Group's Introductory Report (4%): This is a 1 ½ - 2-page introduction which discusses the purpose(s) and functions of the product, its parts, materials, why it is needed, and who the target market is. Introduction can also include a mention of the team members who produced the product, their background and majors. This report will be placed near the beginning of the project report as explained in the report organization section.

Group's Individual Report (6%): A 3 - 5-page, double-spaced written report is required from each student. The report should include the following (each with its own subheading or title): 1) a 1 – 1 ½ page description of all your **individual activities and personal contributions to the whole project**, including project planning, meeting discussions, minutes, decisions, errands, production activities and so forth, 2) a 1 – 1 ½ page **description of how your product and production activities incorporated ethical considerations for the environment, society, employees, customers, organization etc.**, and 3) a 1 – 2 page report on **how you think the product itself, design, processes, materials, and project can be improved** drawing from your experiences from the time the original product development idea was initiated. Each report should have the student's name, assigned parts' names, and product name on the top right hand corner. All individual reports should be collected and bound into one report as described in the section below.

Report Content Organization and Submission (4%)

The comprehensiveness of this project demands that each group submit their report in a professionally, thermal bound report like the samples shown here. All materials generated should be placed in the report and their pages noted before submission. The project report is due on the scheduled date (see class schedule). Most contents should be printed on standard letter-size paper. The only exception would be larger sheets if needed for readability in graphic drawings. However, larger sheets should still be folded such that they are nearly letter-size (no larger than 9"x 12" after folding). All photographs should normally be incorporated directly into the document as digital images printed on ordinary paper. The contents of each portfolio should be ordered as follows.



1. Cover Page that includes a title for the group, an image of the product, the course name, semester and year, and the names of everyone in the group.
2. Table of content for the entire report
3. Group's 1 ½ - 2-page introductory report
4. A copy of team's schedule
5. Log of group's meetings
6. Final Assembly or 3D drawing (complete, titled and clearly labeled)
7. Individual cover sheet for first team member:
 - a. 3-5-page report for the first team member
 - b. Updated fully dimensioned, specified and titled part and/or component drawing(s) and documented design materials for which first team member had primary responsibility
8. Individual cover sheet for second team member:
 - a. 3-5-page report for the second team member

- b. Updated fully dimensioned, specified and titled part and/or component drawing(s) and documented design materials for which second team member had primary responsibility
- 9. Individual cover sheet for third team member:
 - a. 3-5-page report for the third team member
 - b. Updated fully dimensioned, specified and titled part and/or component drawing(s) and documented design materials for which third team member had primary responsibility

Grading Criteria: This is a 200-point project and is worth 80% of the overall course grade. Below is the weighting distribution. Specific expectations for each item are detailed in the attached grade sheet.

Criterion	Points
1) Report organization, evaluated on TEAM basis	10
2) Log of group's meetings, evaluated on TEAM/INDIVIDUAL basis	15
3) Comprehensive project schedule, evaluated on TEAM basis	10
4) Status reports, evaluated on INDIVIDUAL basis	20
5) Documented Engineering, Membership, or Process Changes, evaluated on a TEAM basis	10
6) Availability of student for planned activities, evaluated on an INDIVIDUAL basis	20
7) Compliance with schedule, evaluated on TEAM/INDIV basis	15
8) Group introductory report, evaluated on Team basis	10
9) Group individual report, evaluated on INDIVIDUAL basis	15
10) Oral presentation, evaluated on INDIVIDUAL basis	25
11) Finished product, evaluated on a TEAM/INDIVIDUAL basis	<u>50</u>
Total Points Possible	200

Grading Criteria for Senior Project (200 Points)

Criteria	Points	<u>Points Received</u>		
		<u>Group</u>	<u>Members' Names</u>	
1. Report Organization: Completeness, format, clear title page, team members' names, table of contents, introductory report, detailed meeting log, sequenced and well-organized members' reports, well bound etc.	(10)	_____	_____	_____
2. Introductory Report (3-5 pages): Completeness, format, grammar, spelling, content, clarity etc.	(10)	_____	_____	_____
3. Project Schedule Plan Execution and Deliverables:				
Comprehensive project schedule:	(10)	_____	_____	_____
Compliance with Schedule:	(15)	_____	_____	_____
Status Reports:	(20)	_____	_____	_____
Log of Group's Meetings:	(15)	_____	_____	_____
Documented Engineering, Membership, or Process Changes:	(10)	_____	_____	_____
Availability of student for planned activities	(20)	_____	_____	_____
4. Finished Product: (General completion as proposed): Completeness, conformance to specifications, finish, fit, burrs, dents, aesthetics, reliability, safety, healthy, application, functionality, performance, extra features, durability, others.	(50)	_____	_____	_____
5. Written Report (3-5 pages): Completeness, format, grammar, spelling, content, clarity etc.	(15)	_____	_____	_____
6. Oral Presentation & Demonstrations: Time, completeness, content, visual aids, clarity, outline, audibility, appearance, etc.	(25)	_____	_____	_____
Total Points Received out of 200		_____	_____	_____
Comments:				
