

San José State University
Aviation and Technology Department
Tech 190B, Senior Project II, Section 02, Spring, 2019

Course and Contact Information

Instructor:	Dr. David P. Yan
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Office Hours:	Thursday: 10:00AM - 12:00 PM; (and by Arrangement)
Class Days/Time:	Wednesday: 1:30PM - 4:45 PM
Classroom:	E490 for lecture, E103, IS117, IS119 and IS122 for project work
Prerequisites:	Tech 190A with a grade of C or better

Course Description

Second half of a one-year team project carried out under faculty supervision, construction, testing, and evaluation of the design from Tech 190A culminating in demonstrations and written and oral presentations to faculty and peers. (Lecture/Seminar 1 hour, Laboratory 6 hours, 3 units).

Course Goals

Tech 190B and its complementary course Tech 190A are designed to prepare seniors for careers after graduation as well as to show that they can work together with other students to bring what they have learned in their programs into a successful team project that reflects all the knowledge and skills of the team members. These Senior Project courses are also designed to offer students an interdisciplinary experience involving both manufacturing systems and computer, electronics, and network technology as they work to complete their projects. Tech 190A and Tech 190B must be taken in sequence, starting with 190A in the fall semester of their final full academic year at SJSU. This means that students who wish to take this course must have applied for graduation before the start of the fall semester, and must normally be graduating in either the following May or in December of the next year.

Tech 190B is the second class in the sequence and will focus strongly on production of product design and proposal developed in Tech 190A. Therefore, the bulk of the work in Tech 190B is the planning and fabrication of the actual product idea. While most of the activities will be undertaken in the labs, there will be in-class planning activities, homework, activities outside class, and oral/written reports. Students must have access to high speed internet, a computer, access to Canvas, the SJSU learning management software, CAD, Multisim, and basic word processing and spreadsheet software (Word and Excel or equivalent).

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. Work effectively on a team of students to complete a project

2. Define the societal needs, carrying out market study/economic and budget analyses
3. Develop a complete set of functional specifications for the project
4. Develop design models and/or drawings for prototype and final design
5. Develop a schedule, and meet schedule and budget constraints
6. Procure, fabricate, and assemble prototype and final design hardware
7. Evaluate, test, and analyze prototype and final design
8. Describe the global, social or cultural influences of the project
9. Describe the effects of their project on society locally and/or globally
10. Evaluate and describe in detail the environmental and economic impact of the project
11. Evaluate and describe the health and safety of the project and its effect on quality of life
12. Write reports and make presentations effectively

Required Texts/Readings

Textbook

1. Michael G. Luchs, Scott Swan and Abbie Griffin, “Design Thinking: New Product Development Essentials from the PDMA”, 1st Edition, Wiley, ISBN: 9781118971826. eBook, available at King Library
<https://ebookcentral.proquest.com/lib/sjsu/detail.action?docID=4041673>

Other technology requirements / equipment / material

1. Multisim or other appropriate electronic design software (Required for course).
2. Student Edition of 2017-2018 SolidWorks CAD software, available at any of the following sites (Required for course).
 - a) Available on all 30 workstations in the class and some selected college labs
 - b) <http://www.novedge.com/products/2928>
 - c) Spartan Bookstore's website: http://www.creationengine.com/html/ss_spartan.html
3. Other readings and handouts as assigned.
4. A minimum of 16g flash drive.
5. Laptop/notebook computer with ample memory and speed.
6. Scientific hand calculator with trig and square root functions.
7. Safety goggles.
8. All needed materials as specified on first project proposal’s bill of materials.
9. All needed machines, hand/power tools and cutting tools as specified in the first project proposal.
10. Appropriate test and measurement instruments:
 - a) For lengths – rulers, tape measure, digital calipers etc.
 - b) For electronics: digital test instruments – multimeters, voltmeters etc.

Course Requirements and Assignments

1. In order to receive a passing grade, a student must:
 - a) Demonstrate attention to punctuality and sensitivity to time requirements.
 - b) Complete all project tasks and meet all of the milestones.
 - c) Attend weekly meetings with team members and project advisor. While attendance is not mandatory, students should note the importance of their presence to plan and complete the project as proposed, and must therefore notify the instructor and their group members with prior written notices if they will not be in class for a day’s activities. However, too many absences suggest a student’s lack of readiness for

the project and may lead to a student's dismissal from the project. Instructors will use their judgement in knowing when too many absences are involved.

- d) Complete all deliverables by the due dates specified by the instructor.
- e) Participate in the final project presentation.
- f) Complete and submit all take-home assignments as scheduled.
- g) Take exit exam on time when applicable.

2. At the end of the semester, each student (or team) is required to:

- a) Submit a finished product.
- b) Submit a final project portfolio.
- c) Participate in the official team presentations
- d) Demonstrate prototypes and other artifacts during the final presentation.

3. Senior Project (200 points =80% of course grade)

The main thrust of Tech 190B is to produce a well-planned senior product. Therefore, the goal of senior project is to produce the original product developed in Tech 190A. This new product design was undertaken in Tech 190A, resulting 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.

The bulk of the points in Tech 190B is dedicated to the activities surrounding the project. The senior project has five main gradable areas, including: (a) Project Schedule Plan Execution and Deliverables, (b) Project Presentation, (c) Finished Product and Quality, (d) Group Report, and (e) Portfolio Content Organization and Submission. Each of these areas has subdivisions which are graded and add up to their predetermined points. The details of the five areas of the senior project will be discussed in a separate handout during the project's introduction.

4. Class Assignments (50 points =20% of course grade)

There will be five (5) class assignments designed to help students understand the various aspects of Tech 190B. Two of these assignments will be on the various manufacturing processes undertaken in the production of the senior project, while the other three will come from selected chapters of the required text. These assignments will be issued in class at various times in the semester during and after class discussions. Each of the assignments is worth 4% of the course grade and is due in class as scheduled by the instructor.

“Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

Final Examination or Evaluation

5. Final Exam

Tech 190B does not have a final exam.

Grading Information

Your grade will be based on your performances in the assignments and group project activity and reports. The following items and percentages are used to determine your course grade:

Item	Number of items evaluated	Total Percentage
Assignments	5	20
Comprehensive project schedule, evaluated on TEAM basis	1	4
Compliance with schedule, evaluated on TEAM/INDIV basis	1	6
Status reports, evaluated on INDIVIDUAL basis	1	8
Log of group's meetings, evaluated on TEAM/INDIVIDUAL basis	1	6
Documented Engineering, Membership, or Process Changes, evaluated on a TEAM basis	1	4
Availability of student for planned activities, evaluated on an INDIVIDUAL basis	1	8
Oral presentation, evaluated on INDIVIDUAL basis	1	10
Finished product, evaluated on a TEAM/INDIVIDUAL basis	1	20
Group introductory report, evaluated on TEAM basis	1	4
Group member individual report, evaluated on INDIVIDUAL basis	1	6
Portfolio organization and submission, evaluated on TEAM basis	1	4
Total		100

Determination of Grades

Grade	Percentage
A plus	96 to 100%
A	93 to 95%
A minus	90 to 92%
B plus	86 to 89 %
B	83 to 85%
B minus	80 to 82%
C plus	76 to 79%
C	73 to 75%
C minus	70 to 72%
D plus	66 to 69%
D	63 to 65%
D minus	60 to 62%

Classroom Protocol

1. Class and Lab Times and Usage

While the bulk of Tech 190B is on lab activities, the class will normally begin in the assigned classroom where important announcements, lectures (when applicable), group meetings, and other important discussions will be held. From there, student teams can proceed to their needed lab areas for production of their products. Instructor may also call all teams to meet in the classroom if there is need for any discussions that may involve the entire class.

2. Laboratory Access

Projects are expected to involve activities and lab work related to both CENT and MFGS knowledge and skills; thus, key labs will be available to this class. You are expected to use the labs as needed during the class hours to conduct work for your projects. You may use the labs at any time they are available, following correct lab safety guidelines at all times. You will need permission to use the labs when other instructors are using them. In addition, E390 is a college lab with many workstations and software available to all college of engineering students.

3. Project Materials

Since each project will be unique and cannot be anticipated, materials and parts required for group projects must be obtained independently by each group. Students are encouraged to design projects which are inexpensive, and/or to find industry sponsors for project components and materials.

4. Participation, Leadership and Initiative

The senior project courses Tech 190A and 190B are largely student-driven. Your leadership and initiative make up a significant portion of your course grade. While senior project work is done in teams, you must also be a self-starter to carry your share of project workload, to work effectively in your groups, and to seek help when it is needed. Your ability to do this will strongly affect your grade.

University Policies

Per University Policy S16-9, relevant information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

Tech 190B-02 / Senior Project II, Spring 2019, Course Schedule

(Schedule is subject to change with notice)

Course Schedule

Week	Date	Topics (lecture contents)	Readings, Assignments, Deadlines
1	The 1st day of Instruction on Jan. 24 (Thursday)	(NO CLASS THIS WEEK)	
2	Jan. 30 (Wednesday)	<ol style="list-style-type: none"> 1. Orientation to the class 2. Discuss on course goals, logistics, grading, expectations, syllabus, assignments, status report etc. 3. Introduction to Senior Project-I 	All readings are from the required texts: 1). Michael G. Luchs, Scott Swan and Abbie Griffin, "Design Thinking: New Product Development Essentials from the PDMA", 1st Edition, Wiley, eBook 2). Outside materials provided in class
3	Feb. 6	<ol style="list-style-type: none"> 1. Introduction to Senior Project-II 2. Status reports 3. Group meeting and planning 4. Comprehensive project schedule 5. Assignment 1 	
4	Feb. 13	<ol style="list-style-type: none"> 1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor 	<ol style="list-style-type: none"> 1). Comprehensive project schedule due 2). Status report 1 due 3). Assignment 1 due
5	Feb. 20	<ol style="list-style-type: none"> 1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor 4. Assignment 2 	<ol style="list-style-type: none"> 1). Textbook Ch. 23 2). Status report 2 due
6	Feb. 27	<ol style="list-style-type: none"> 1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor 	<ol style="list-style-type: none"> 1). Status report 3 due 2). Assignment 2 due
7	Mar. 6	<ol style="list-style-type: none"> 1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor 4. Assignment 3 	<ol style="list-style-type: none"> 1). Status report 4 due
8	Mar. 13	<ol style="list-style-type: none"> 1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor 	<ol style="list-style-type: none"> 1). Status report 5 due 2). Assignment 3 due
9	Mar. 20	<ol style="list-style-type: none"> 1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor 4. Assignment 4 	<ol style="list-style-type: none"> 1). Textbook Ch. 24 2). Status report 6 due
10	Mar. 27	<ol style="list-style-type: none"> 1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor 4. Assignment 5 	<ol style="list-style-type: none"> 1). Status report 7 due 2). Assignment 4 due
11	Apr. 3	SPRING BREAK (NO CLASSES)	

Week	Date	Topics (lecture contents)	Readings, Assignments, Deadlines
12	Apr. 10	1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor	1). Textbook Ch. 25 2). Status report 8 due 3). Assignment 5 due
13	Apr. 17	1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor	1). Status report 9 due
14	Apr. 24	1. Lab exercise 2. Group meeting and planning 3. Meet with project advisor	1). Status report 10 due
15	May 1	1. Group and individual report writing 2. Oral presentation preparation 3. Portfolio preparation 4. Last minute lab exercise 5. Group meeting and planning	1). Cleanup designated labs 2). Return checked out tools
16	May 8	1. Last Day of Instruction is May 13 2. Team presentations	1). Portfolio submission due 2). Finished product due 3). Oral presentation due