San José State University
Aviation and Technology Department
Tech 190A: Senior Project I, Section 3, Fall 2017

Course and Contact Information

Instructor: Dr. Samuel C. Obi

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Office Hours: M: 12:00 NOON - 2:00 PM; (and by Arrangement)

Class Days & Time: Thursday: 1:30 – 4:15 PM

Class Room: E394 for lecture and lab; E101 for selected lab activities

Prerequisites: E100W and Senior Standing

Course Materials
Copies of the course materials including the syllabus, lecture slides, projects, etc. may be found at http://www.sjsu.edu/people/samuel.obi/

Course Description
First half of a one-year team project carried out under faculty supervision. Project will proceed from problem definition to proposal preparation with feasibility plans, specifications, design validation, prototype construction, and testing, oral/written reports, and career and professional seminar participation. (Seminar 9 hours per week, 3 hours in class, 6 hours by arrangement)

Course Overview and Purpose
Tech 190A and its complementary course Tech 190B 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 190A is the first class in the sequence and will focus strongly on professional development involving the careers you are likely to follow, and new product proposal development. For the year-long project, you will work on project proposal preparation with feasibility plans and specifications. There will be in-class lectures with activities, homework and activities outside class, oral/written reports, and career and professional seminar participation. Students must have access to high speed internet, a computer, access to Canvas, the SJSU learning management software, CAD and basic word processing and spreadsheet software (Word and Excel or equivalent).

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

1. To work effectively on a team of students to complete a project.

2. To define the societal needs, carrying out market study/economic and budget analyses

3. To develop a complete set of functional specifications for the project

4. To develop design models and/or drawings for prototype and final design

5. To develop a schedule, and meet schedule and budget constraints.

6. To procure, fabricating, and assembling prototype and final design hardware

7. To evaluate, test, and analyze prototype and final design

8. To describe the global, social or cultural influences of the project

9. To describe the effects of their project on society locally and/or globally

10. To evaluate and describe in detail the environmental and economic impact of the project

11. To evaluate and describe the health and safety of the project and its effect on quality of life

12. To write reports and make presentations effectively.

Required Textbook and Other Materials
1. Michael G. Luchs, Scott Swan, Abbie Griffinv (2015). Design Thinking: New Product Development Essentials from the PDMA 1st Edition. Wiley-Blackwell. (eCopy is available at King Library located at: http://ebookcentral.proquest.com.libaccess.sjlibrary.org/lib/sjsu/detail.action?docID=4041673). (**Required for course**):
2. Multisim or other appropriate electronic design software. (**Required for course**):
3. Student Edition of 2016-2017 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

4. Other readings and handouts as assigned.
5. A minimum of 8g flash drive
6. Laptop/notebook computer with ample memory and speed
7. Scientific hand calculator with trig and square root functions
8. Safety goggles
9. Appropriate test and measurement instruments:
    a) For lengths – rulers, tape measure, digital calipers etc.
    b) For electronics: digital test instruments – multimeters, voltmeters etc.

Outline of Course Content and Objectives
This course emphasizes professional development and senior project development.
Therefore, the two parts are outlined as follows with associated objectives:

Part 1: Professional Development
    Unit 1: Resumes and Cover Letters
    Unit 2: Soft Skills Improvement
    Unit 3: Personal Career Development Plan
    Unit 4: Professional Portfolio

Part 1 Objectives:
    1. Prepare professional resume
    2. Prepare professional cover letters
    3. Improve listening capability
    4. Improve verbal communications
    5. Improve interviewing and Networking skills
    6. Understand workplace relationships
    7. Understand workplace communication etiquette
    8. Improve written and oral communication
    9. Determine personal career development plan
    10. Produce professional portfolio

Reading List and Materials for Part 1:
    1. Business Soft Skill Video presentations, available at:
    https://www.hoopladigital.com/title/11059419
    2. Resource materials from SJSU Career Center located at:
    http://www.sjsu.edu/careercenter/
    3. Handouts for part 1
    4. Class activity materials
    5. Invited speaker(s)

Part 2: New Product Proposal
    Unit 1: Feasibility plans
    Unit 2: Specifications
    Unit 3: Analysis
    Unit 4: Evaluation
    Unit 5: Documentation
    Unit 6: Portfolio

Part 2 Objectives:

1. Conduct survey and market analysis
2. Determine form, fit, and function with data from market study
3. Understand key design thinking terms and principles
4. Determine material and component specifications
5. Conduct new product analysis
6. Evaluate and checks design against specifications
7. Produce 3-D prototypes
8. Produce new product documentation
9. Produce new product portfolio

Reading List and Materials for Part 2:
1. Michael G. Luchs, Scott Swan, Abbie Griffinv (2015). Chapters: 1, 2, 3, 4, 5, 7, 10, 13, 20 & 22.
2. Resource materials provided in class
3. Handouts for part 2
4. Class activity materials
5. Invited speakers

Course Requirements

Reading Assignments

All textbook and assigned resource reading assignments must be completed according to the activity schedule, and students must be prepared for discussion of weekly reading topics in class. In addition, students will undertake other assigned readings relevant to topics being discussed and studied in class.

Class Assignments (100)

There will be 10 class assignments designed to help students understand the various aspects of Tech 190A. Most of these assignments will come from the reading assignments from the text in the form of synopsis, while the rest will come from topics covered by invited guests and other class topics. These assignments will be issued in class at various times in the semester during and after class discussions. Each of the assignments is worth 10 points and is due in class as required by the instructor.

A maximum of two (2) of these assignments can be made up by attending the College of Engineering's Silicon Valley Leaders Symposium. Each made-up assignment must be submitted within one week of the said assignment. The student must write a typed, one-page synopsis or summary essay of the symposium's presentation, including the speaker's name, title, company, and date of the presentation. It should be signed and dated by the professor or person coordinating the symposium on that date.

Professional Development (150 points)

The goal in professional development is to have a professional portfolio that describes who you are, who you aspire to be, and how to fulfill that professional aspiration. A professional portfolio, which is an organized collection of relevant documents and artifacts that showcases your talents, most relevant skills, and charts your professional growth, will be developed.

There are four parts to the professional development section of this class. They include your resume and cover letters, soft skills literacy an improvement, personal career development plan, and professional portfolio. A more detailed handout about the assignment will be provided in class.

New Product Development (160 points)
The new product development section of Tech 190A will be done in groups of 3-4 students, as much as possible from different concentrations. Preferably, an ideal team should have two CENT and one or two Manufacturing Systems students. It has both team aspects and individual aspects. Each individual team member has distinct responsibility to design, document, and prototype the approved product. Each team's product proposal is expected to involve significant amounts of CAD and electronic circuitry design. CENT students are expected to undertake all or most of the computer/electronics design and wiring, while Manufacturing Systems students are expected to do all or most of the CAD work. The goal is to eventually develop a new product portfolio which includes detailed work on the product's feasibility studies, parts and components specifications, analysis, evaluation and full documentation. A more detailed handout about the project will be provided in class.

Grading	# Assigned		Points Each		Totals
Class activities and assignments	10	x	10	=	100
Professional development	1	x	150	=	150
New product development	1	x	160	=	160
Total					**410**

Grading Policy
Professional and Career Development 37%
Senior Project 39%
Class activities…………………………………………………….24%
(see above list of reports and deliverables)

A+ : > 96	A : 93 - 96	A- : 90 – 92
B+ : 87 – 89	B : 83 - 86	B- : 80 – 82
C+ : 77 - 79	C : 73 - 76	C- : 70 – 72
D+ : 67 – 69	D : 63 - 66	D- : 60 – 62
F : < 60	(0.5 - 0.9) = 1	(0.1 - 0.4) = 0

Policy on Exams and Tests: There are no makeup assignments, reports, in-class tests or exams. Assignments missed are excused only with *written* documentation of unanticipated personal emergencies or by prior *written* permission of the instructor.

Report Due Dates: Late reports are not accepted. The grade of any late reports will be assigned a "zero" mark. Late reports may or may not be graded. *As with exams and tests, late reports are excused only with* **written** *documentation of unanticipated personal emergencies or by prior* **written** *permission of the instructor.*

Classroom Protocol

    A. 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. It is open M-F 7:00 AM - 11:00 PM.

- PLEASE NOTE that some CENT students who have not taken Tech/ME 20 may be at a disadvantage in CAD systems, but can easily catch up with practice.

    B. 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.

    C. Participation, Leadership and Initiative

Note: The senior project courses Tech 190A & 190B are largely student-driven. Your leadership and initiative make up a significant portion of your course grade. You must 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.

Group Work: Study groups are encouraged for all course activities. However, typically, Career and Professional Development work and assignments are done individually, and Senior Project work is done in teams.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/"

Senior Projects Course ~ Semester Schedule – Fall 2017
Silicon Valley Leadership Symposia, Thursdays from noon to 1 pm in Engr 189
https://engineering.sjsu.edu/our-college/events/silicon-valley-leaders-symposium
This course schedule is subject to change with due notice

Wk	Week of:	Topic (lecture content)	Recommended Readings and (Assignment Due Dates)
	Class meets _____	*When there is no lecture specified, you are expected to be working on your design projects and/or assignments.*	*All assignments due as scheduled unless stated otherwise.*
1	Aug. 24 (Thursday)	• Orientation to the class. • Resume writing introduced	*All readings are from the required text (Design Thinking), Handouts and Outside Materials provided in class.*
2	Aug. 31	• Introduction to professional development • Introduction to Soft Skills • Resume Writing and cover letters • Introduction to Power Listening	• (Resume)
3	Sep. 7	• Introduction to the Business World • Business Verbal Communication • Business Written Communication • Personal Career Development Plan	• (Cover Letter)
4	Sep. 14	• Finding a Job • Workplace Relationships • Career Transitions • Professional Portfolio	• (Personal Career Development Plan)
5	Sep. 21	• Interviewing and Networking • Phone Etiquette • Email Essentials	• (Soft Skill Comprehensive Report)
6	Sep. 28	• Customer Service Basics • Successful Meetings and Events	• (Professional Portfolio) • (Presentations)
7	Oct. 5	• Introduction to new product development • Definitions • Procedure	• (Professional Portfolio) • (Presentations) • Chapter 1: A Brief Introduction to Design Thinking • Chapter 2: Inspirational Design Briefing • Chapter 10: Design Thinking for Non-Designers: A Guide for Team Training and Implementation

8	Oct. 12	• Introduction to new product development • Team formation • Feasibility plans • Conceptualization	• Chapter 3: Personas: Powerful Tool for Designers • Chapter 4: Customer Experience Mapping: The Springboard to Innovative Solutions • Chapter 20: Consumer Response to Product Form • (Survey Instrument) • (Group Schedule)*
9	Oct. 19	• Specification of Materials and Components • Addition of Geometric Features • Inclusion of Greater Dimensional Details and Specifications	• Chapter 5: Design Thinking to Bridge Research and Concept Design • (Proposal/Group Schedule)*
10	Oct. 26	• Synthesis • Analysis • Evaluation • Prototype Printing	• Chapter 7: The Key Roles of Stories and Prototypes in Design Thinking • (Proposal)
11	Nov. 2	• Analysis • Evaluation • Prototype Printing	• (Design synthesis)
12	Nov. 9	• Analysis • Evaluation • Prototype Printing	• Chapter 13: Knowledge Management as Intelligence Amplification for Breakthrough Innovations • (Design Analysis)
13	Nov. 16	• Documentation: product and part/component views in the form of working drawings, detailed and assembly drawings, dimensions, tolerances, special manufacturing notes, and standard components part numbers, bill of materials, circuit design specs and detailed part specifications and product electronic data files	• (Process Plans for Parts, Components and Assembly)
14	Nov. 23	• **Thanksgiving Holiday**	• **Thanksgiving Holiday**
15	Nov. 30	• Portfolio Preparation and Report Writing	• Chapter 22: Future-Friendly Design: Designing for and with Future Consumers
16	Dec. 7	• Team presentations	• (Portfolio)

		• **Last Day of Class is December 7**	

*Teams that submitted items as scheduled will receive 10 out of 10 on project schedule points.

THIS SCHEDULE IS SUBJECT TO CHANGES DEPENDING ON CIRCUMSTANCES DURING THE SEMESTER

Posted Dates are Thursdays Unless Specified.

All Assignments are Due on Thursdays Unless Changed by Instructor.

Monday, September 4 is Labor Day (Campus Closed)

Friday, November 10 is Veteran's Day (Campus Closed)

Wednesday, November 22 is Non-instructional holiday (no classes held)

November 23 – 24 is Thanksgiving Holiday (Campus Closed)