

EEL 4920 - U01 Senior Design I

Fall 2021

Professor Wilmer Arellano
arellano@fiu.edu
(305) 348-4905
Electrical and Computer Engineering

Classroom: TBD
Class Time: TBD
Office Hours: TBD
Office: EC 3834

Important Information

Before starting this course, please review the following pages:

- [COVID-19 Guidelines](#)
- [Accessibility and Accommodation](#)
- [Academic Misconduct Statement](#)

*The professor reserves the right to change or modify the syllabus anytime during the semester.

Catalog Description: Beginning of the Major Design Experiment of the Profession ethics, oral communications, project feasibility study, proposal writing, system design methodology, human factors, intellectual property, liability, and schedules.

Course Description:

The course's main objective is to prepare students for the realization of a Capstone Project. Emphasis is placed on Successful Design, an idea that involves Local and Global Acceptance. Local Acceptance is achieved by careful analysis of client and user needs, and Global Acceptance by considering the input from persons of different countries and cultures plus International Technical Standards and eliminating barriers to trade. Rules of the World Trade Organization (WTO) are used to illustrate issues impacting international trade.

In EEL-4920, students engage in a close to real-life project design and management experience. Early in the semester, students must organize in teams on their own. The requirements are that teams must be multidiscipline and contain a minimum of 3 students per team. Usually, the number of members is 4 or 5. Each team selects a team leader and finds 3 potential topics of interest. Armed with these topics, the team finds a Mentor and negotiates the topic of the design. After this point, teams must prepare a proposal for the project that will be carried out during EEL-4921C. Students must clarify the need for their project during the proposal preparation, considering the

mentor/client's point of view, survey results, and group brainstorming. The proposal should persuade the audience to buy into the project. The proposal also includes a Feasibility and Risk Analysis, a survey of related projects and patents, plus a Theory Model Analysis of potential Ethical Dilemmas of the project, Health, Safety, Sustainability, Standards, and Globalization issues.

Prerequisite: Senior standing.

Corequisite: N/A

Reference Textbook: CLIVE L. DYM & PATRICK LITTLE. (2013). ENGINEERING DESIGN. (4TF. Ed.). John Wiley & Sons, Inc. (ISBN: ISBN: 978-1-118-32458-5)

Course Objectives:

- Develop the ability to outline and plan an engineering project with several phases and participants from distinct disciplines
- Conduct a team-based project
- Perfect communication and analysis of technical concepts and alternatives

Global Learning Objectives:

- This course is a Discipline-specific Global Learning course that counts toward the graduation requirement.
- Use a Global Perspective to achieve a design that will have Global Acceptance and minimal barriers to trade.

ABET Relationship of course to program outcomes:

In this course, students will be evaluated on the following program outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

Relationship of course objectives to Global Learning outcomes

1. an ability to demonstrate Global Awareness about local, global, international, and intercultural issues that may affect a successful design.
2. an ability to conduct a Global Perspective analysis to understand the needs of local, global, international, and intercultural markets.
3. an ability to demonstrate Global Engagement by taking actions toward a successful global, international, and intercultural design.

Global Learning Required Reading

- [Globalization and Standards](#)

Global Learning Recommended reading

- [The WTO in brief](#)
- [Understanding the WTO](#)
- [Standards Education](#)
- [UNIDO Role of Standards](#)

Topic Covered:

1. Introduction/Teamwork
2. Proposal and Technical Research Writing
3. Components
4. Problem Statement, Need Analysis and Assumptions, and Limitations.
5. Feasibility Analysis, Operating environment,
6. Intellectual Property
7. Intended user(s) and intended use(s), Background
8. Globalization and Standards
9. Health and Safety Considerations
10. Manufacturability Considerations
11. Environmental Considerations
12. Ethics
13. Concept Development, End Product Description, and Other Deliverables
14. SOW/GANTT CHARTS
15. Oral Presentation Skills
16. Functions and Specifications
17. Electric Grounds
18. Power Supplies

Department regulations concerning incomplete grades:

1. Must not be able to complete the course through documented circumstances beyond his/her control.
2. Must be passing the course before that part of the course that is not completed.

3. Must contact the instructor or the secretary immediately before or during the part missed so that the instructor will be aware of the circumstances causing the incomplete.
4. Must make up the incomplete work through the course instructor and should not be allowed to sit through another entire course to make up the incomplete.
5. Must make proper arrangements with the instructor to complete the course before the last two weeks of the second term.

Learning Activities:

- Project Conception and Management
 - Students form multidiscipline teams
 - Members of each team select a team leader
 - Teams find 3 potential topics of interest
 - Teams negotiate with potential mentors about their mentorship and the topic. Mentor and topic are chosen.
- Communication
 - Teams prepare a Project Proposal with two partial deliveries with revisions.
 - Teams present to the class their project in two deliveries.
 - Teams specifically present why their team is multi-disciplined.
 - Teams specifically present their Global Content as Impact of Standards on Trading in a Global Market, acceptance of their project in a different culture, and collaboration tools.
- Global Positioning
 - Students upload to youtube.com a presentation on their project where they introduce their team and provide demonstrations and explanations about the starting project.
 - These videos are accessible to people in any country with no internet restrictions.
 - Samples can be found on Google with the keywords: "YouTube FIU senior design projects."

Lecture Schedule:

Week	Lecture	Lecture
1	Introduction	Sponsors' Presentations
2	Thee Topics Presentation	Style (Proposal Writing)
3	Need Analysis	Specifications
4	Concept Generation – End Product Description	Ethics
5	Intellectual Property	Positive use of Body Language
6	Preparing Oral Presentations	Video Production
7	Paper review	First Round of Presentation
8	Second Round of Presentation	Third Round of Presentation/ First Exam
9	Feasibility Analysis	Globalization and Standards
10	Statement of Work	Sustainability
11	Health and Safety	Design for Manufacturability / Final Details
12	Paper review	Fourth Round of Presentation
13	Fifth Round of Presentation	Sixth Round of Presentation / Second Exam
14	Campaign Video	Proposal

Presentations Rubric:

Date						
Topic						
Team						
Deductions	Up to	Team Member 1	Team Member 2	Team Member 3	Team Member 4	Team Member 5
Reading	27.0%					
Body Language	22.5%					
Content	9.0%					
Visuals	9.0%					
Short Presentation	13.5%					
Dress Code	9.0%					
TOTAL	90%					

Global Grading: 4=Excellent, 3=Good, 2=Fair, 1=Poor, 0=Noncompliance		
Global awareness: Was the team able to identify, analyze, and integrate international standards' effects in multiple markets and cultures?	10%	
Global perspective: Did the team demonstrate an ability to conduct a Global Perspective analysis leading to understanding the needs of local, global, international, and intercultural markets		
Global engagement: Were the students able to demonstrate Global Engagement by taking actions towards a global, international, and intercultural successful design.		
COMMENTS:		

Examination Policy:

- Make-up tests will be given only with official written confirmation of reasons.
- Inform the instructor about the problem to make special arrangements by the next class. You may inform the instructor about your issue by:
 - Sending an email to arellano@fiu.edu
 - Leaving a message at 305-348-4905
 - In-Person
 - Using a messenger

Failing to follow notification guidelines will make you non-eligible for a make-up exam. All excuses must be submitted in original and include contact information for verification purposes.

- Make-up tests will be comprehensive
- Cheating in an examination will result in an "F" in the course.

Department regulations concerning incomplete grades:

1. Must not be able to complete the course through documented circumstances beyond their control.
2. Must pass the course before that part of the course is not completed.
3. Must contact the instructor or the secretary immediately before or during the part missed so that the instructor will be aware of the circumstances causing the incomplete.
4. Must make up the incomplete work through the course instructor and should not be allowed to sit through another entire course to make up the incomplete.
5. Must make proper arrangements with the instructor to complete the course before the last two weeks of the second term.

Grading Policy:								
Quantity	Description	Value	Total		A	95-100	C	70-76
2	Research Projects & Presentations	20%	40%		A-	90-94		
					B+	87-89		
2	Test	30%	30%		B	83-86	D	60-69
1	Final Demonstration	15%	15%		B-	80-82		
1	4921C Proposal*	15%	15%		C+	77-79	F	0-59
<p>*A signed EEL 4921C proposal is required to pass</p> <p>No Late Assignments</p> <p>All notifications or changes will be emailed only to your FIU email address or posted on the Course Web Site. Please ensure that the instructor has your correct email address and check the Website frequently.</p>								