

Senior Design Sequence

EEE 488 and EEE 489



WIRED

In Your Face

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This kid is about to change gaming, movies, TV, music, design, medicine, sex, sports, art, travel, social networking, education—and reality. The **Oculus Rift** is here, and it will blow your mind.
by Peter Rubin

Palmer Luckey





Senior Design is Finishing School for Electrical Engineers

Capstone structure

- EEE 488 and EEE 489 comprise a two-semester capstone senior project for Electrical Engineering students.
- You must enroll in EEE 489 in the subsequent semester:
 - You will be working in the same teams;
 - Failure to take EEE 489 with your team will require you to re-take EEE 488.

Capstone Structure

- In **EEE 488**:
 - Teams are formed.
 - Projects/mentors are selected.
 - The planning, research, and design phase of the project is completed, and progress is documented.
- In **EEE 489**:
 - The plan is executed, evaluated, and improved.
 - The work is documented in a final report.
 - The project is presented to the public during **DEMO DAY**.

EEE 488/489 are different from other courses in the EE program

- In most courses in the EE program,
 - you study a related set of fundamental engineering principles and...
 - apply these principles to solve relatively simple closed-ended problems on homework (to learn how to apply the principles) and quizzes/tests (to make sure you learned the material).
- Senior Design is pretty-much the opposite of this!
 - Very open-ended.
 - Highly fluid.
 - Multiple people you have to keep happy.

In EEE 488/489 you will

- Need to apply engineering principles from different classes;
- Learn something about “soft engineering” considerations (e.g., the manufacturability of a concept);
- Work in teams on an open-ended project where even the project definition and goals may evolve over time;
- Answer to a technical mentor (who is usually but not always an EE program faculty member) as well as the course coordinator and your team members;
- Write reports and make oral presentations instead of tests.

Teams

- Teams must consist of (3 or) 4 members.
- Students form their own teams by connecting with each other.
- Team formation should be completed within the first month of the semester.
- The team will remain intact for both EEE 488 and EEE 489.

Project mentor

- Each team will be mentored by a professional who is usually an EE faculty member or industry supervisor.
 - Some project mentors have their own project ideas.
 - Other mentors will support teams in their own projects.
 - In either case, the mentor will supply 40% of your course grade (so choose wisely).
- Each group is required to find their own mentor.
- Your mentor ultimately answers to the Director of the School of ECEE for his/her mentorship of senior design teams.

Project attributes

1. The project should be comprehensive and integrate multiple areas covered in your EE coursework.
2. The problem should be open-ended, challenging, and meet a societal *need* or *want*, i.e., it should be *value*-driven.
3. The problem size should be appropriate for a small group, a two semester timeframe, and constrained resources.

Project attributes

- You will be working on these projects intensely for the next two semesters, so make sure you pick a project you find interesting.
- The projects are intended to be real-world, open-ended, inter-disciplinary endeavors.
 - This is far more challenging than a homework assignment or a class project.

Project attributes

- Each capstone project team must have a project mentor.
- Regardless of how the initial project definition arose, the student team is expected to take **full ownership** of the project.
- You should have to learn new things to complete the project.
- Your project mentor should guide you in determining what you need to learn, and provide or recommend references.
- Your project mentor should also help the team break the project into logical steps with achievable milestones.

Projects to avoid

- Your project should not simply replicate an existing product.
- Your project should not infringe in any other way upon the intellectual property rights of any individual or corporation.
- Your project should not endanger yourselves or others, nor should it damage property or the environment, nor violate any state or federal laws or regulations.
- Your project shouldn't be utterly boring.

Project resources

- As much as possible, you should design from the ground up with off-the-shelf components or sub-systems.
- You can get access to components, development kits, etc. for little or no cost through the School or manufacturers.
- Use ASU-provided or free software to design (e.g., Autodesk suite) or manage the project (e.g., Microsoft Project).
- We have several 3D printers available plus access to machine shops.

Palais Senior Design Prize

- In 1998, the ASU Department of Electrical Engineering established an award to recognize the best senior design project in EE. The award is presented each semester to the team of students whose capstone design project is judged to be the semester's best.
- A small cash prize funded by Professor Emeritus Joseph Palais is awarded to the winners of the contest.

Recap

- Senior Design is actually one of the most important classes you will ever take.
- You will work in teams on open-ended projects.
- You get to select your team members, mentor, and project.
- Capstone projects receive a lot of recognition from faculty, students and benefactors as well as the broader community.
- 50% of the grade is technical and 50% communications
- Communications include written documents, video reports, presentations, and a running blog.