Senior Design Project – SDP16

Introduction
10 September 2015

C.V. Hollot
Professor and Head
SDP16 Clock has been Ticking

SDP16 Demo Day
22\textsuperscript{nd} April 2016

\sim 356 \text{ days}
\sim 240 \text{ days}
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### Curriculum Worksheet for the Computer Systems Engineering Classes of 2014 through 2018

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<td>CMP SCI 121 Intro. Problem Solving w/Comp [3 cr] [Note 2]</td>
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<td>ENG 112 Digital Systems, unless ENG 112 was taken in Fall 2014 or earlier. [4 cr] [Note 4]</td>
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The curriculum notes can be found on the reverse side of this worksheet.

UNIVERSITY OF MASSACHUSETTS AMHERST • DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
http://ece.umass.edu/ Updated March 2015
Students Empowered

- Select your own team
- Select your own project
- Select your own advisor
- Empowerment
- Responsibility
Course attributes

- Idea → prototype (year-long hackathon)
- Ideas self-generated
- Teams self-form
- Self-learning opportunities
- Impact on society
- Pre-professional experience in engineering design
- Minimal classroom interactions
  - Weekly team/advisor meetings
  - Reviews before faculty evaluators
Takes a Department to do SDP

- Team Member #1
- Team Member #2
- Team Member #3
- Team Member #4

Faculty Advisor

- Faculty Evaluator #1
- Faculty Evaluator #2

ECE Department
SDP16 Reviews (the drumbeat)

- Problem statement
- System specifications
- Design alternatives
- Block diagram

Preliminary Design Review (PDR)  
**Oct**

- Subsystem prototyping

Midway Design Review (MDR)  
**Nov**

- System Integration

Comprehensive Design Review (CDR)  
**Feb**

Final Product
- Functionality
- Specifications
- Integration

Final Project Review (FPR)  
**April**

Block Diagram

SDP Day  
**22nd April**

ECE Projects Showcase  
**23rd April**
SDP16 Course Deliverables

- Review Presentations
  (PDR/MDR/CDR/FPR slide decks)

- Project Website

- Written report

- Demo Poster

- System Prototype
Projects

- What do you want to learn?
- Choose an area – become an expert
- Explore past SDP projects
  - UMass
  - Other ECE departments
- SDP projects are:
  - differentiators at job interviews
  - not PhD dissertations
Must contain a “Hardware Design Component”

**Good**
- Raspberry Pi
- Smart sensor board (custom, PCB)

**Bad**
- Arduino
  - + Wi-fi shield
  - + plug-in sensor
SDP15 Process

- Teams of 4 students
  - Choose one team manager

- Advisor
  - Each team chooses its own ECE faculty advisor

- Meetings
  - Weekly team meetings
  - Weekly advisor meetings
  - Course meetings

- Project budget: $500
  - Some parts available in SDP lab or M5
Review and Grading Process

- Review panels (PDR, MDR, CDR, FPR)
  - Panels consist of several professors from our department
  - 20/30 min presentation by team + 20 min Q&A

- The final grade for ECE 415 (and ECE 416):
  - Advisor grade (50%): Given at the discretion of the advisor
  - Review Board grade (30%): Average of review panel grades
  - Course Coordinator grade (20%): Based on attendance, project documents and performance
  - Each team member graded individually.
Senior Design Project - SDP16

Welcome to Senior Design Project 2016 (SDP16)

Course Overview

The Senior Design Project provides a capstone experience for undergraduate students in the Department of Electrical and Computer Engineering. Students work in teams of 3-4 students in this year-long course sequence to design and prototype a system of their choice. Past projects have included a variety of topics ranging from home automation systems to ultra wide band wireless links, assistive robots, and wireless drumsticks. Each team is advised by a faculty member in the department and projects undergo several formal reviews. The learning goals for the senior design project include technical design, teamwork, presentation skills, an understanding of realistic constraints, economics, and ethics.

NEWS

- First Lecture: 4pm, Thursday, 10th September '15, Elab II, Room 119
- Advisors due: 15 September '15.

http://www.ecs.umass.edu/ece/sdp/sdp16/
Real-Time Concussion Analyzer (SDP13)
Hologram Machine (SDP14)
Finger Tracking

1. Linear IR Laser Beam ~790nm

2. A finger breaks the IR beam

3. IR Camera sees finger reflection

Before

After
Assignment

• Project concept/ develop problem statement (elevator pitch, abstract)

• Confirm faculty adviser by Tuesday, 22nd September’15
Career planning

• Engineering Career Center (Cheryl Brooks), Marston 114

• Resume & Career Fair Prep Workshop 15th & 21st September’15

• Career Fair, 30th September’15