ECE 4901
Computer and Electrical Engineering
Design I

John Chandy and Liang Zhang

http://ecesd.engr.uconn.edu
Our Team

• Faculty
  – Rajeev Bansal
  – Necmi Beyici
  – John Chandy
  – Ashwin Dani
  – Shalabh Gupta
  – Sung-Yeul Park
  – Helena Silva
  – **Liang Zhang** (senior design coordinator)
  – Lei Wang
  – Shengli Zhou

• Lab Engineer: Philip Duncan
Course Objective

• The course objective is to provide an opportunity for students to apply their engineering knowledge to solve open-ended problems using a multidisciplinary team approach.
Multidisciplinary Teams

• Design teams include at least three members.

• Multidisciplinary Teams
  – May include members from different programs
  – May include members from the same program but with different areas of concentration, experience, strengths, or interests
  – Are assigned by us
Design I Overview

- Lectures & a Quiz on Design/Professional Issues
- Formation of Multidisciplinary Teams
- Weekly Team Meetings
- Project Statement and Specifications
- Senior Design Contract
- Components specified, ordered, and evaluated
- Proposal (Written)
- Design Review
- Initial development of prototype
- Final Report (Written and Presentation)
Design II Overview

- Design I teams carry forward
- Weekly Laboratory Sessions
- Weekly Team Meetings and Reports
- Completion of prototype development

Implementation

Redesign

Evaluation

Final Report (Written and Presentation)
Weekly Team Reports

- Name of Project (also that of the Sponsor)
- Names of Team Members
- Work Completed during past week (individual contributions)
- Future Work
- Project Review (status)
Project Statement

- Title, Team Members, Sponsor, Date
- Statement of Need
- Preliminary Requirements
- Basic Limitations
- Technical Specifications
- Other Data
- Questions
Project Proposals (written)

• Title, Team Members, Sponsor, Date
• Executive Summary
• Statement of Need
• Project Description
  – Methods (discuss design alternatives)
  – Block diagrams, flow charts
  – Budget
  – Timeline
• Conclusion
Design Review (oral)

• Defend your design in front of faculty team
• Preliminary design
  – Full technical review
  – Math/physics/EE basis
Final Report
(written and oral)

• Similar Structure to Proposal
• Includes
  – Complete design (discussion of design alternatives)
  – Complete List of Components
  – Verification of Design (e.g., by SPICE, MATLAB)
  – Preliminary eval. of comp., subsystems, and prototype
  – Industrial standards applicable to the design
  – All details necessary for prototype completion
    • Detailed circuit diagrams, flow charts, code, mechanical drawings
What is expected of *individuals*?

- Attendance of lectures
- Quiz
- Active participation in team activities
- Maintenance of a laboratory notebook
- Full participation in all presentations
Grading

• Class participation 5%
• Weekly individual deliverables 15%
• Quiz 10%
• Weekly team deliverables 10%
• Project Statement and specs 10%
• Project Proposal 10%
• PCB Design Problem 5%
• Design Review 10%
• Final Report 15%
• Final Presentation 10%
Facilities

• ITE Senior Design Laboratories C19, C23, and C25
• Dedicated instrumentation stations
  – Oscilloscopes
  – Power Supplies
  – Function generators
• Handheld Portable Oscilloscope
• Dedicated computers
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>September 4</td>
<td>Project preference sign-up closes</td>
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<tr>
<td>September 9</td>
<td>Project team rosters posted</td>
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<tr>
<td>September 23</td>
<td>Project Statement Due</td>
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<tr>
<td>October 21-25</td>
<td>Design Reviews</td>
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<td>October 30</td>
<td>Proposal Due</td>
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<td>November 13</td>
<td>Quiz</td>
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<td>November 18 – November 22</td>
<td>Final Oral Presentations</td>
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<td>December 2 – December 6</td>
<td>Final Oral Presentations</td>
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<td>December 6</td>
<td>Final Proposal Report Due</td>
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Conclusion

• Senior Design is a two-semester sequence which will allow you to use your skills to solve an open-ended design problem using a multidisciplinary team approach
• Challenging
• A great experience
Resources

- Your project sponsor: for most project-related issues
- The faculty advisor assigned to your project
- Lab engineer (Phil Duncan)
- Senior design coordinator (Prof. Liang Zhang)
- Department administration staff: for all procurement of materials (excluding those directly provided by the sponsor)
- Other University resources (e.g., computer labs, 3D-printing machines, machine shop)
What’s next??

• Fill up the student survey to sign up for your top 5 choices of projects:

– https://forms.gle/goCFRz5oLYGAP4ta9