ECE/RS-493
SENIOR ADVANCED DESIGN PROJECT

Meeting #1
Q1: How many teams worked over the break?
Q2: Which teams already met before this class meeting?
Q3: Which teams finished early prototyping?
ECE/RS-493
SENIOR ADVANCED DESIGN PROJECT

- Course Coordinator (CC): Dr. Pachowicz
- Faculty Supervisor (FS): (a faculty associated w/ ECE Dept.)
- Associate Chair (AC): Dr. Kurtay
- Course materials on the web:
  - Pamphlet, Schedule, Meeting presentation slides, Resources
- Senior Design Project Lab: Rm.3511 (+ Fabrication Lab: Rm.3503)
  - Available to ECE492/3 students only
- Textbook
  - “Design for Electrical and Computer Engineers” by Ford and Coulston
  - PPT presentation slides
  - Magazines: Circuit Cellar, and Elektor (GMU library)
Research and Scholarship (RS)

- ECE493 is a RS designated course
- RS contact office: OSCAR at GMU
  - You need to consult CC before
- It means that:
  “Students are given the opportunity to actively participate in the process of scholarship and will make a significant contribution to the creation of a disciplinary-appropriate product.”
- Direct benefits for your team:
  - OSCAR can provide help and/or funds for a variety of student-oriented activities
Motivation

• This is a competitive effort – seriously, watch out!
  – During the final presentation, your project will be compared against the other projects
  – Continuity of project progress will have a significant influence on your progress and grade

• Resume and job factor

• You should already be working with full speed for more than a week

• Warning
  1. If your project is delayed, you will have a real difficulty to make up lost time. The quality will suffer.
  2. ECE Dept. does not hesitate to issue unsatisfactory grades
Scheduled Meetings

• Class meetings
  – See Schedule and Due Dates sheet
  – Attendance is mandatory (signup sheet)

• Team meetings
  – Mandatory team meeting required at least once a week! All team members must attend. This is a formal requirement.
  – Meetings must be documented by “Weekly Task Allocation/Delivery” sheet. These sheets will be submitted to CC and/or FS on request.

• Meeting your FS
  – Coordinate with your FS, but . . .
    You should establish some rules for getting feedback – e.g., meet your FS on Monday after delivering a document on Friday
Presentations

The following are formal presentations:

- **Week #10**
  - In-Progress Presentation
    (a formal presentation in front of your FS and at least one more faculty)

- **Week #14**
  - Final Presentation
    (a formal public event)
# ECE/RS-493 Activities and Milestones

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>TIME</th>
<th>MILESTONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• End of prototyping</td>
<td>Week 1</td>
<td>→ Class meeting #1</td>
</tr>
<tr>
<td></td>
<td>Week 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Week 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Week 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Week 5</td>
<td></td>
</tr>
<tr>
<td>• Full scale implementation</td>
<td>Week 6</td>
<td>→ Class meeting #2</td>
</tr>
<tr>
<td></td>
<td>Week 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Week 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Week 9</td>
<td></td>
</tr>
<tr>
<td>• Testing</td>
<td>Week 10</td>
<td>→ In-Progress Presentation</td>
</tr>
<tr>
<td>• Final Reporting</td>
<td>Week 11</td>
<td>→ Class meeting #3</td>
</tr>
<tr>
<td>• Preparation for final presentation</td>
<td>Week 12</td>
<td>→ Final Report and Oral Presentation</td>
</tr>
<tr>
<td></td>
<td>Week 13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Week 14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Week 15</td>
<td>→ Project Poster Due</td>
</tr>
</tbody>
</table>
Deliverables

• **Week #2**  (all delivered in one envelope)
  – Project Title form
  – Project Description/Abstract
  – Test Plan and WBS

• **Week #5**
  – Progress Report #1

• **Week #10**
  – Progress Report #2: In-Progress Presentation slides

• **Week #14**
  – Final Report

• **Week #15**
  – Project Poster

(For cover page format – see ECE-493 pamphlet)
For successful completion of ECE 493 you must:

1) **Build a working system**
2) **Obtain test results and evaluate them**
3) **Give final presentation**

Key to success

- From modules to a system
- Incremental implementation and immediate testing
- Follow implementation plan
- Show discipline and good working habits
- Focus on quantitative results
Grading

• This is only a guidance – your FS may apply his/her own priorities

• Components:
  1. Technical / engineering in-depth study; Approach and technical merit of the solution (based on Final Report) (25 points max)
  2. Teamwork habits (15 points max)
  3. In-Progress Review (based on project progress and timeliness) (15 points max)
  4. Final presentation (15 points max)
  5. Experimentation and results evaluation (based on Final Report) (20 points max)
  6. Administrative issues, Lessons learned, and Other issues properly addressed in the Final Report such as: Reason for the project; Potential use; Alternative designs; Cost and time; Maintainability; Retirement, replacement, or disposal (see point #11 of the ECE-493 pamphlet) (based on Final Report) (10 points max)

• Two team evaluations will be completed
ECE-492/3 is a Team Project

- All members are expected to act professionally
- Personality differences among members are not relevant. The common goal is all that matters!
- Respect each other by:
  - Doing your tasks on time
  - Keeping in contact with each other
  - Helping other members without being asked
- Keep yourself organized
- Work through frustration
- Focus on your assigned task and getting the JOB DONE
- Plan ahead
  - Planning will help you to run a project faster and ‘safer’
  - Think what can go wrong and always have a ‘Plan B’
Test Plan for ECE-493

• Next week, you have to submit your revised Test Plan
  – Review your requirements specification
  – Review your system architecture and functionalities of modules
  – Decide on how you are going to justify success of your project (during Oral Presentation and in Final Report)
  – You need to focus on:
    • **Acceptance testing** (most important)
    • Unit/Integration testing (secondary importance – in case your project encounters problems – this is your Plan B for testing)

• This is your last chance to significantly modify your original Test Plan from ECE-492

• Your final Test Plan must include 2-3 test cases

• Your test plan will be discussed/evaluated during our next meeting
Test Case Format

A written document explaining your experimental approach to:

- Prove that your project succeeded (complies with requirements)
- Show comprehensive behavior of a system/module with respect to a stated objective

1. **What do you test?** --- which requirement/behavior/function
2. **How do you test it?** --- explain your experiment to be carried out, variable system inputs/influences, external/internal conditions, etc.
3. **Which data to be collected, from which ‘locations’, and how collected?** - say which outputs, internal data points, etc. (use of dedicated data loggers, transfers from memory, manual measurements, etc.)
4. **How are raw data processed?** --- explain a process used to transform raw data into quantitative results (simple averaging, stat analysis, etc.)
5. **Determine characteristics to be used to present results** --- graphs (what is represented by X-axis, Y-axis?)
6. **Evaluate project success** --- a set of questions to be answered based on the above mentioned graphs
< Example Test Case >
• Next week, you also have to submit your final WBS
  – Review a list of tasks and subtasks from ECE-492 Design Document
  – Review time allocation to these tasks
  – Indicate milestones – demos to FS, demo at In-Progress Presentation
  – Your early prototyping effort should give you a better idea on difficulties ahead
  – If you have a task completed (over summer/winter break), include it in the list of tasks and indicate a degree of completion (in %)

• Your WBS is the guideline for running your project and you have to stick to it
1. Cover page with the report number

2. Technical Section:
   • Description of progress for each task/subtask of the WBS undertaken in the reporting period
   • Results achieved in the reporting period (pictures, data, graphs, etc.) – a report without demonstrating the evidence of your progress claims is not a valid report

3. Administrative Section:
   • Progress summary table – list of tasks and subtasks in a table format with graphical (bars) and numerical (percentages) progression indicators. Mark milestones on the table as well.
   • Funds spent at that point
   • Man-hours to that point
4. Plans for the next reporting period (In-Progress Review)
   • Which tasks to work on?
   • What kind of demo(s) to be presented?
   • Which problem areas to be solved?

5. Provide answers to the following questions:
   a) Is the project on schedule?
   b) Are there any problem areas causing project delays, etc.?
   c) Plan to deal with problems/delays.