**What's Due, and When... Spring, 2015**

**1. Professional Self Assessment Report -- Due Friday, April 24 by 5:00 to Grotjohn/Udpa and facilitator (one per student). You can submit electronically. Pdf format please.**

**2. Working demonstrations**

**a) Working prototype demonstration for Grotjohn/Udpa: April. 20th and 22th. Sign up for a scheduled time on the ECE 480 lab door.**

**b) Final Demonstration for facilitator: sometime BEFORE Design Day or at Design Day if your project can be demonstrated completely there and your facilitator can attend.**

**c) Hint: When you get your prototype work, do a short video in case something bad happens to your prototype before Design Day.**

**3. Two copies of your poster prepared according to specifications and posted on the course web page. Team members, in staggered shifts, must be on hand 8:00am – 12:00pm in Engineering Building at your table, except when team is making its Final Oral Presentation.  After Design Day, you must return one copy of your poster to the ECE 480 lab for later posting; the other copy goes to your sponsor.**

**4. Evaluation of Teammate’s Contributions: Each person on each team must fill in and return the form to be mailed out to the class evaluating the contributions of each other member of the team. This information will be used, together with grading by the instructor and facilitator, in determination of each individual’s grade. These evaluations must be completed and emailed to** [**grotjohn@egr.msu.edu**](mailto:grotjohn@egr.msu.edu) **no later than Monday, May 4th.**

**5. Final Written Report (one report per team) - Prepare 3 PRINTED copies. Also send electronic copies to Professor Grotjohn, Professor Udpa and your facilitator. Printed copies are due in in professor Udpa’s mailbox in ECE Office (2120 EB). If a team member will need additional print quota to print these (and posters), email Professor Udpa before 5:00 Tuesday, April 28th, with the name and email address of the person to receive the page quota, and say how many pages. These reports are ABSOLUTELY due on Wednesday, April 29th, not later than 4:30pm.  Paper copies may be given to secretary in ECE Office to be put in Udpa's and facilitator's mailboxes, but NOT LATER than 4:30pm (remember the office closes at 5:00PM). The report should also be posted on your web page.**

**6. Have your web page completed by 8:00AM on Thursday, April 30th. The judges convene on that day to evaluate your final report and web page.**

**7. By Design Day, you should also prepare a CD or flash drive (2 copies) with ALL of your course material, including all reports and deliverables (one per team). A copy of the final report and CD/Flash drive must be prepared for the sponsor and either hand-delivered to them at Design Day or mailed to them (through the ECE Shop or ECE Office) no later than Monday, May 4th. Unless you are notified otherwise, you must also deliver/ship your prototype to the sponsor by Monday, May 4th, or give it to them at the end of Design Day.**

Final Report Format

*Note: The quality of your final report has a great deal to do with the final grade your team members receive. The more complete, well organized, and detailed the final report, the better the grade. The judges are very aware of these requirements for contents of the final report.*

Also provided below are the *evaluation criteria* the judges will use at the end of the semester to judge your project. The inputs of the judges will be a consideration in your final grade. You will find the *evaluation criteria* to be based on the same questions and documentation your team will be expected to cover in your final report, poster and final oral presentation.

Use this template as you work to complete your final deliverables.

Required Final Report Format

Page Description

1. Cover page, including project title, appropriate course identification and sponsor logo(s), and all authors
2. Executive summary – Write a description, as described in class, not more than 250 words, that summarizes your project in an “executive summary” format. While brief, it should typically summarize your problem and objectives, results obtained, and (as appropriate) impact. Imagine that it may be all, or at least the first thing, that an executive reads, and this is where you convey the success of your project. There isn’t room for your figures and tables of data to prove your point, but you need to summarize the key evidence that your technology worked and fulfills the objectives!
3. Acknowledgment: Write a short paragraph of appreciation to your project sponsor, and be sure to name specifically any individuals that helped your team through your project. This is a chance to give credit where credit is due to your helpers/mentors/sponsors.
4. Table of contents – list (and link if possible for electronic form) your report by chapter or section

The rest of the report should be divided up into chapters or sections that roughly follow your project from inception to conclusion, as described below. As you write these sections, document judiciously with digital photographs, flow or FAST diagrams, figures, schematics, Gantt charts, etc., as described below. Remember, this part of the report describes WHAT problem you are trying to solve, WHY you chose this solution, HOW you implemented the solutions, WHAT problems were overcome and HOW were they overcome, including a final summary.

Chapter 1 – Introduction and background: Here you should describe your problem in some detail. Answer the following Heilmeyer system engineering questions as you write your report in prose:

What are we trying to do?

What is the problem we are trying to solve? What are the objectives?

How is it done today, and what are the limitations of current practice?

What is new in our approach, and why do we think it will be successful?

Assuming we are successful, what difference does it make

**Chapter 2 – Exploring the solution space and selecting a specific approach:** In this section, you should decompose your problem into subsystems and/or component parts using the FAST diagram technique you learned this semester. Additionally, apply the House of Quality technique to determine the Critical Customer Requirements - CCRs – for your design. The CCRs are the measurements you will make during design development to ensure you are making progress towards a successful design that will accomplish your sponsor's deliverables and goals. You should include the feasibility and decision matrices you used to decide what conceptual design(s) you selected for further development. In describing the solution chosen, you should answer these questions:

*“What is new in our approach, and why do we think it will be successful?*

*What gives evidence that it will work?*

Budget: you should put together an initial estimate of costs to implement your solution – depending on the nature of your project, either the cost to MSU to build your prototype, or the estimated cost per unit of your design in production. You should include a Gantt chart documenting your original plan for how the work was to be executed from week 4 until the end of the semester. If it changed significantly during the semester, you should include the final Gantt chart, as well, explaining the reasons for the differences. (If the Gantt charts require many pages, they may be included in appendices, but discussed in the body of the report.)

Chapter 3 – Technical description of work performed. This section should be fairly detailed. It should describe all the technical work that was needed to complete your prototype. You should have sub-sections in this chapter that describe all that are applicable to your project: (1) Hardware design efforts, (2) Hardware implementation and photo documentation; (2) Software and interface design requirements; (4) Software implementation, including screen captures and an overview description of how this software is new; What problems were encountered building the system? How did you overcome the problems?

Chapter 4 –Test data with proof of functional design: This section should showcase your product or prototype. You should show how you tested the device, and answer whether it worked completely, partially, or maybe not at all. It is not uncommon that a product didn’t work in the end. This is called a “successful failure,” but ONLY if you document why it didn’t work out the way it was planned or designed. Projects that don’t function at the end of the semester will not be unduly penalized provided there is ample documentation of what went wrong and why.

Chapter 5 – Final cost, schedule, summary and conclusions: This section, less than 1,000 words, should summarize the project findings, successes, failures, and suggestions for future work, should another design team decide to take this project further in future semesters. Remember, many executives only read the Executive Summary and perhaps the Conclusion of these kinds of reports. Make the best effort to succinctly describe what was done, as well as whether or not it was done on time and within budget. List your final costs and your final schedule as executed. For the final cost include both the actual amount your team spent on the project and the projected cost if multiple units were made (on a per unit cost basis).

Appendix 1 – Technical roles, responsibilities, and work accomplished.

*This Appendix should consist of each individual on the team writing (not less than) 300 words describing his/her technical role in the project and the specific technical work they accomplished as a member of this team*. *It is NOT a description of the non-technical roles. It should include a picture of the team or individual pictures of the team members, appropriately identified.*

Appendix 2 – Literature and website references

*This appendix should list references of any books, data sheets, web sites, manuals, etc. used to research, design, and implement your project.*

Appendix 3 and beyond – Detailed technical attachments –

*To make the rest of the document readable, you should place HERE the following:*

* All flowcharts, schematics and parts lists (create good drawings) not provided and discussed in the body of the report
* All models and any simulation results (e.g. SPICE simulations if done, etc.)
* All software source code listings, APPROPRIATELY COMMENTED
* Any PCB board layout plots
* Specification sheets of any specialized parts (limit the number of pages- only for uncommon components)
* Any other information that documents your product for your sponsor or other users

**Other Details**

**Final Oral Presentation (Friday, May 1st, one per team at Design Day, Engineering Building, according to posted schedule).**

Length 25 minutes – ~20 minutes for presentation, 5 minutes for setup/answering questions from judges, demonstrating for judges

PowerPoint Presentation Organization

Describe your project goals

Review your design specifications

Show the final design and evaluate it with respect to your proposed design specifications

Offer suggestions for future design improvements

Demonstrate your design (if possible) in use

**Final CD/Flash Drive (two per team -- one for instructors, one for sponsor) -- Instructors copy due on Design Day at 4:30pm; you must hand-deliver other copy to your sponsor, together with anything else you are to give to sponsor, or you may package and address it for mailing and turn it in to the ECE Shop, not later than Monday, May 4, before or while turning in your other materials to the ECE Shop.) MAKE SURE THE ALL MATERIAL IS ON THE CD/FLASHDRIVE (Sometimes teams have turned in CDs that have links on them that go away later in time.)**

Place a copy of your web page and all design team work (software, reports, etc.) on the CD ROMs. This is needed for the department’s ABET accreditation process, to document your work.

**Hand In Your Project Notebook/Journal for the Last Time, ONLY to your Facilitator (mailbox). Due 4:30pm, Friday, May 1, to facilitator mailboxes (ECE Office may have a box where they can be turned in)**

** If you want to keep your notebook, you may submit a photocopy.**

**Your prototype is probably owed to your sponsor, and otherwise, it MUST be turned in to the ECE Shop.  If not sure which, check with Sponsor.  If due to sponsor, you may deliver prototype (and CD-ROM) on Friday, if sponsor attends presentation; otherwise, you must package it for mailing and take it to ECE Shop no later than Monday, May 4th, and they will send it to sponsor. If one of your posters was not given to the sponsor, turn it in to the ECE Shop for mailing. In any case, bring the other poster back and leave it in the ECE 480 lab for us to post in the hallway.**

**Complete and hand in your team’s Lab Equipment Return Form**

**It MUST be Signed by the ECE Shop -- (one per design team take it there).  They will sign it when you have cleaned out your locker, turned in your lock, and returned all hardware furnished by ECE for construction of your project (except what will be given to your sponsor), for example, power supplies, specialized lab instruments, etc. ALL sponsors this semester should receive the prototypes you have built, plus any supporting material promised to them.**

**Due: Tuesday, December 9th, noon, signed form in Grotjohn's mailbox (ECE Office).**

**The form is provided on the next page for you to print out, if lost.**

*4:30pm Friday, May 1, is the final due date for all ECE 480 deliverables except the Lab Equipment Return Form.*

*Missing items will impact the evaluations/grades given, as will late items.*

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**ECE 480 Design Team Equipment Return Form-One per Team**

**(To be signed by ECE Shop, then returned to Grotjohn)**

All items that you borrowed from the ECE shop, or had purchased through the ECE shop, and your team’s padlock must be returned to the ECE shop by **noon on Monday, May 4th.** You also need to have all of your personal belongings out of the ECE 480 lab by this time, at which time the door will be locked.

 DESIGN TEAM #\_\_\_\_\_\_\_\_\_\_\_\_

Items below to be completed by the ECE shop staff:

Padlock returned: YES NO

All equipment and tools borrowed from the shop have been returned: YES NO

All parts obtained from or purchased through the ECE shop and NOT to be given to sponsor have been returned: YES NO

Prototype has been packed for shipment to sponsor and taken to ECE Shop, or has already been delivered to sponsor: YES NO

The ECE Shop is satisfied that all items have been returned properly

ECE Shop Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Return completed form to Dr. Grotjohn no later than **5pm on May 4th**.