

# The Art of Proposal Writing

ECE 2031

Design Proposal Assignment

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# Why Do a Design Proposal?

- Because open-ended design problems are a key part of your engineering education, and a proposal is “Step 1” of such a problem
  - And a requirement of this ABET-accredited curriculum
- You will have to think about an even more open-ended problem for your senior design project
  - This is an easier “practice run”
- This is what most real engineers do, at some point

# Audience for a Proposal

- Design engineers always have a customer – someone who is paying for the design
  - Management/marketing of the same company that he works for
  - The firm who hires her for a single job, if she is an independent consulting engineer
  - Another large company, using the engineer’s company for “outsourcing”
  - A government agency, including DoD, DoE, DoT (both state and federal), etc.
- Customers (also called sponsors) write RFPs (Requests for Proposals)
- Responders (also called offerors or proposers) write proposals, which are usually evaluated competitively by the customer

# “Open-endedness”

- Some problems are more open-ended than others.
- You may get a problem that has rigid specifications.
  - Often called “requirements-based design”
  - Typical of defense work that is to be put in the field
- In the commercial world, or in basic research and development, the specifications are less clear.
  - This allows the designer more flexibility
- Your 2031 design project is somewhere in the middle.

# Writing the Proposal

- The RFP for this semester's project is the information you already have:
  - Adding some I/O peripherals that work with SCOMP
    - You must add the LCD as an output device
    - You must add the PS/2 keyboard OR mouse interface
    - You must add at least one other peripheral
  - Writing an application for SCOMP that showcases the new peripherals
- The proposal you write will address how your team plans to address the requirements
- Your proposal will follow the format explained on the "Proposal Assignment Sheet"

# Proposal Detail

- Each team's proposal should be DIFFERENT
- Assume the reader has basic knowledge of DDL tools and equipment
  - Do not waste pages with details of Quartus, the DE2, VHDL language description, etc.
  - But do not immediately jump into your design without SOME background for context
- Different proposals may have similar background information
  - DE2 board features, etc.
  - But this should be short and concise
- Focus on YOUR unique aspects
  - I/O devices chosen and their implementation
  - Application chosen and its implementation

# Organizing the Proposal

- All proposals will include the following sections/headings:
  - Executive Summary (ES)
  - Technical Approach
  - Management Plan
- Additionally, each section (except the ES) will contain relevant, descriptive subheadings.
- Additional subheadings will be determined by each team.

# Executive Summary

- Similar to an abstract
  - the entire proposal condensed into one paragraph
  - write it last!
- Briefly define the problem being addressed
- Briefly discuss the approach that will be used to solve the problem and explain the strength of the approach

# Technical Approach

- Use descriptive subheadings
- Explain the context for the DE2, SCOMP, and I/O devices.
- Briefly describe the design requirements.
- Explain exactly what devices you are adding and why
- Explain exactly what application you are developing and why
- Describe how you plan to use DE2 hardware features (connectors, peripherals, anything that matters for your project)
- Describe anything that is connected to the DE2 and HOW YOU KNOW IT IS SAFE (for you, the device, and the DE2)
- Explain a minimum of what will be demonstrated (you can always add more later)
- You should “sell” your idea as being sufficiently complex and interesting

# Technical Approach Tips

- This section must address the user interface for your application. What specifically will the inputs and outputs be and how will they work?
- It should address the importance of the application you have chosen. Is it entertaining? Does it solve a practical problem in telecommunication? or control? or what?
- It should expound on the specifics of each I/O device, with greatest emphasis on the ones that require the most original work.
- It should be clear what design entry methods are used, where simulation is to be applied, how it will be tested in modules, how it will be integrated, etc.

# Management Plan

- Gantt Chart will make up the bulk of this section of the proposal
- “Show” the plan via the Gantt Chart.
- The only paragraph of text in this section is a brief description of individual assignments and your contingency plan, accounting specifically for how you will handle any problems that arise (if X doesn't work, we will do Y).