
PROPOSAL OUTLINE AND GRADING

Your report will be broken into 5 major sections, with multiple chapters in each.

FINAL SD1 PAPER – Grading Rubric

The final SD1 Project Proposal Written Paper is worth 40% of your ME 4201 course grade. It consists of 5 major sections, with multiple chapters in each. The following grading rubric will be used to evaluate the sections in your paper.

5%	Section 1: Initial Required Report Items
30%	Section 2: Project Description
30%	Section 3: Design Syntheses
25%	Section 4: Plan for Analyses
10%	Section 5: Remaining Items

Each team will submit one report. Your report will be typed, double line spaced, 12 point Calibri font, justified alignment – and housed in a spiral-bound report cover. Pages must be numbered. You will also submit a digital version of your report via D2L that in PDF format.

SECTION 1 – INITIAL REQUIRED REPORT ITEMS (5% of report grade)**COVER LETTER** (30 points)

- A one-page letter explaining briefly *what* you are turning in.
- Each team mate must sign this letter.
- students should be listed alphabetically by last name, with the Project Manager parenthetically identified.

TITLE PAGE (10 points)

- This is a Proposal and Progress report for ME 4201-02
- Include your team name and number, project title. List names again (but don't sign) and date.

ABSTRACT (40 points)

- 1-2 paragraphs – no more than 1 page.
- This briefly describes everything in the report. (Not to be written as a “teaser”.)

TABLE OF CONTENTS (20 points)

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SECTION 2 - PROJECT DESCRIPTION (30% of report grade)**INTRODUCTION** (35 POINTS)

- include some of the literature **review**/research that you used *to find the project*. Do not just copy your Annotated Bibliography here!
- This section should discuss current lit review/research findings in a conversational way with citations referring to the bibliography. Following ASME journal formatting of citations and references, [in-text citations](#) should be enclosed in brackets [#]. Papers in the Reference section need to be listed in the order in which they appear.
- Engineering Design/Testing Standards – if you discuss required or relevant standards, make sure that you reference them from your bibliography.
- Plan for continued work on this topic

PROBLEM STATEMENT AND NEEDS ASSESSMENT (15 POINTS)

- Summarize in 1 or 2 paragraphs the reason for this design.
- What “problem” does it solve?

DESIGN CONSTRAINTS (15 POINTS)

- List here design constraints/specifications.
- For example, weight, cost, durability...

DESIGN CRITERIA, AKA GOALS (10 POINTS)

- Consider general goals on page 123 of the Voland text, plus make specific goals.

SOCIETAL AND GLOBAL IMPACTS of this project (5 POINTS)**ECONOMICS** (10 POINTS)

- Describe the economic impact of this project.
- Begin planning here, but you will expand in SD2.
- Eventually you will need to show cost analysis for materials, transportation, and marketing of this product/project; as well as the breakeven point and calculate a budget.

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ENVIRONMENT SUSTAINABILITY (10 POINTS)

- Describe the Environmental Sustainability of this project.
- Begin planning here, but you will expand in SD2.
- Eventually you will need to describe materials, energy, transportation, recycling activities; as well as provide account of sustainability and comparison to standards such as EPA.

SECTION 3 – DESIGN SYNTHESIS (30% of report grade)

- Break your design into systems, subsystems and parts, being sure to fully describe each. Every part that needs to be designed, and how it fits into the larger system, should be explained. Strongly consider using an organizational chart to relate parts, subsystems and systems.
- For each part that needs to be designed, each student must submit design ideas. They should be sketched on green engineering computation paper and scanned. Include enough sketches so that the concept that you are proposing is fully shown. Include relevant dimensions.
- Each individual design idea must be accompanied by a written description.
- Sketches must be digitally scanned – photographs are not accepted. You may use Notes (for iPhones), **Office Lens** app, OneDrive app or an equivalent to create a (faux) digital scan from your smart phone. Alternatively, a digital scanner is available in the library. I have found the Office Lens scanning app to work very well on my iPhone and iPad. Make sure that you tightly CROP and ZOOM all scans (key). If you use Office Lens, apply a black/white document filter.
- Create a Design Matrix for each part that must be designed, using, at a minimum, the individual proposed designs. Your team may also develop a hybrid design that includes the best aspects of several of the individual designs. Weigh each criterion from 0-1 (or 1-100, etc., and then score each concept on a 0-10 relative scale. (Weights do not have to add to 1.)
- Describe why each criteria weight was assigned, and why each alternative was scored as it was. The results of your design matrix should be discussed and justified in detail. Be certain that all of the decisions that your team made in developing and selecting your final solution are stated explicitly.
- Best design concept selected from the Design Matrix is now selected for further design work, some of which may be completed in SD2.

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- If you have time, you can add your initial SolidWorks drawings. Best design concept selected from the Design Matrix is now selected for further design work, some of which may be completed in SD2.
- The parts that need to be designed will be graded as follows:

20 points	Breakup of Design into Systems, Subsystems & Parts
20 points	Individual Design Ideas
20 points	Design Matrices
10 points	Design Matrices – weight justifications
10 points	Design Matrices – score justifications
20 points	Selected winning designs

SECTION 4 – DESIGN ANALYSIS (25% of report grade)

- Create a table with all analyses and appropriate safety factors.
- Include completed analysis, if any, at this stage
- Include a plan of all analysis that will be finished in SD2.
- Determine safety factors for strength, yield, etc.
- Your analysis plan must include at least two Engr/ME analysis using course/textbook methods with engineering paper, calculator, and/or Excel/Matlab. Note that you may need to simplify the structure etc. This is usually done during and after the detailed design phase.
- Your analysis plan must also include CAE analyses.
- Note: your analyses results will likely change design details to better meet design constraints and criteria. Your designs will continue to be fluid until the analyses are complete.
- This section will be graded as follows:

40 points	Hand Calculations, or plans for such
40 points	Computer Aided Analyses, or plans for such
20 points	Determination of appropriate safety factors

SECTION 5 – REMAINING REPORT ITEMS (10% of report grade)**PROJECT MILESTONES AND COMPLETION DATES - INCLUDE GANTT CHART IN APPENDIX** (30 POINTS)

- We will discuss the formation of Gantt charts using MS Word, MS Excel or MS Project.

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- MS Project, now on many PCs in Q building, is best.

CONTACTS (10 POINTS)

- Team Members -- main roles/assignments and contact info
- Client who is sponsoring the project, if any, and their title, contact info
- Professors for SD I and SD II (if known)
- Other professors, professional, technicians, etc., with whom you plan to consult

REFERENCES (30 POINTS)

- This is a list of all works cited in the body of the report.
- Throughout the report, refer to a cited reference using a [#] in the text.
- Your list of references uses the same # in the [order of appearance](#) in this report.

APPENDIXES (30 POINTS)

- Annotated Bibliography. This will be partially a repeat of the References cited, but in alphabetical order, and include a paragraph description – as per your assignment. Additional papers that are somewhat relevant, but not mentioned in the text of the report, should be included here.
- For sponsored projects, include Statement of Work or other documentation of design project provided by the sponsor/client
- Gantt chart may be added here, if not already in “Project Milestone” section.
- add additional appendixes as needed...