Grader’s Seminar
Final Report

• **What:** Discuss requirements for each rubric category and provide guidance on selecting the appropriate letter grade

• **Who:** Led by John & Ken, all participate

• **How:** Identify key content & characteristics of reports corresponding to the range of letter grades

Note: The presented “key content & characteristics” are not all-inclusive. If there are other items you would like to have included, please let us know
1. Background

1.1 Introduction

“General description of the project: What is to be accomplished, relevance / significance to the sponsor, and benefits upon completion. Evidence that the student has added insight.”

- A/A+: Description is complete and comprehensive. Added insight shows clear evidence of communication with sponsor and other relevant individuals. Claims are supported by references. A+ is faculty level / journal quality

- B: Description is sufficient. Added insight provided but some evidence of insufficient sponsor communication & some unsupported claims

- C: Description appears to simply be a rephrasing of original project statement. Added insight appears to be largely unsupported student opinion

- D: Description appears to simply be a rephrasing of original project statement. Little added insight

- F: Description provided but appears to be inferior to a simple rephrasing of original project statement. Little or no added insight

- F-: Completely omitted or no useful content

Note: Grade for section 1 = average of grades for 1.1, 1.2, & 1.3 (if req’d)
1. Background

1.2 Project Description

“Project description, verbatim, from sponsor.”

• A/A+: Brief introductory paragraph followed by project description as provided by sponsor. A+ is faculty level / journal quality
• C: Simple copy-paste of project description as provided by sponsor
• F: Appears to have omitted parts of project description as provided by sponsor
• F-: Completely omitted or no useful content

Note: Grade for section 1 = average of grades for 1.1, 1.2, & 1.3 (if req’d)
1. Background

1.3 Original System*

“Clear, concise description of system as it existed at the start.”

• A/A+: A complete and comprehensive discussion of the original systems structure, operation, performance, and deficiencies. Supported by clear evidence, as most effective, of communication with sponsor and other experts, observation and data collection, modeling and analysis, testing, and/or citing of authoritative sources. A+ is faculty level / journal quality

• B: A complete discussion of the original system’s structure, operation, performance, and deficiencies. Supported by some evidence of communication with sponsor, etc., but could have done more to support claims.

• C: A sufficient discussion of the original system’s structure, operation, performance, and deficiencies. Claims made appear to simply be unsupported student opinion and superficial data collection and analysis.

• D: At least one of the structure, operation, performance, or deficiencies discussions is missing or insufficient. Claims are unsupported.

• F: Multiple discussions of structure, operation, performance, or deficiencies discussions are missing

• F-: Completely omitted or no useful content

* Not present in some reports  
Note: Grade for section 1 = average of grades for 1.1, 1.2, & 1.3 (if req’d)
2. Requirements

2.1 CRs, 2.2ERs, & 2.5 HoQ

“2.1: List of CRs that are clear, comprehensive, necessary, potentially verifiable, and attainable, showing a good understanding of the problem. Weights adding to 250, with justifications. 2.2: Verifiable ERs, with targets and tolerances. 2.5: HoQ in template with CRs, weights, ERs, targets, tolerances, all approvals.”

• Graded by course instructor
3. Existing Designs

3.1 Design Research

“A clear description of how existing designs were researched. Evidence that a reasonable collection of relevant sources (academic and professional journals, the web, catalogs, interviews with sponsor, advisor, etc.) were used effectively. If benchmarking visits were used, a clear, complete description of the benchmarking process, including objectives, sites visited, interviews, observations, and other data collection.”

- A/A+: The web, textbooks, journals, interviews, benchmarking (if appropriate), and other sources were used. All relevant sources were well and thoroughly used. If used, benchmarking process thoroughly described. A+ is faculty level / journal quality

- B: Besides the web and other easily accessible sources, textbooks, journals, benchmarking (if appropriate), and other sources were used to some extent, however not as well or as extensively as would have been most useful. Benchmarking could be better described.

- C: Only easily accessible sources (e.g., on the web) were used, but this appears to be minimally sufficient.

- D: Only easily accessible sources were used, and this appears to be insufficient

- F: A number of obvious and easily accessible sources were not used, insufficient

- F-: Completely omitted or no useful content
3. Existing Designs
3.2 System Level

“At least three system-level existing designs, described in sufficient detail to assess relevance and applicability to the this project.”

• A/A+: A very broad, insightful, and innovative look into systems & technologies both obvious and not necessarily intended for the application area of the project but actually very relevant to a creative and effective design. If benchmarking was used, its results are clearly reflected and well applied. A+ is faculty level / journal quality

• B: Some obvious and relevant and not-so-obviously-related existing designs. However, better designs could likely have been found with a bit more effort.

• C: Fairly obvious examples of existing designs, search was terminated when the minimum required number of existing designs was found

• D: Fairly obvious examples of existing designs, search was terminated before the minimum required number of existing designs was found

• F: Designs listed were not relevant to the project

• F-: Completely omitted or no useful content
3. Existing Designs

3.3 Subsystem Level

“At least three subsystem-level existing designs for each of at least three subsystems of the system to be designed, described in sufficient detail to assess relevance and applicability to this project.”

- **A/A+:** Thoughtful and complete functional decomposition. Subsystems consist of both obvious and not necessarily intended for the application area of the project but actually very relevant. If benchmarking was used, its results are clearly reflected and well applied. A+ is faculty level / journal quality

- **B:** Decomposition is effective, but not optimal. Some obvious and some not-so-obvious existing designs. Better designs could be found with a bit more effort.

- **C:** Functional decomposition consists of the required three subsystems, but is not as useful as it could be. Fairly obvious examples of subsystem designs, search was terminated when the minimum required number was found

- **D:** Functional decomposition is lacking the required three subsystems and/or insufficient number of subsystems. Content that is present is minimally acceptable

- **F:** Functional decomposition is lacking the required three subsystems and/or insufficient number of subsystems. Content that is present is largely unacceptable.

- **F-:** Completely omitted or no useful content
4. Designs Considered

“Descriptions of at least 3 complete and distinctly different designs (incl. all subsystems listed in Chapter 3) clearly derived from the design research in Chapter 3. Technical criteria for comparing designs clearly explained and systematically applied, with special reference to CRs and ERs. Advantages and disadvantages of each clearly and systematically described with respect to requirements and other technical criteria.”

- A/A+: Designs considered are creative, span a wide range of options, and all are shown to be, at least minimally, capable of satisfying all CRs. All rubric-required elements are thoroughly satisfied. A+ is faculty level / journal quality

- B: Some designs creative, some not. Most CRs satisfied, but some minor are not. Advantages/disadvantages discussion present, but not as strong as it could be.

- C: Minimum number of designs is present, only key CRs are satisfied, creativity lacking. Rubric-required elements are satisfied, but in some cases minimally so.

- D: Less than the minimum number of designs, but key CRs satisfied. Incomplete discussion of advantages / disadvantages. Some designs obviously inferior.

- F: Less than the minimum number of designs. Those presented fail to satisfy key CRs, Meaningful discussion of advantages / disadvantages not provided

- F-: Completely omitted or no useful content
5. Design Selected

5.1 Rationale for Design Selection

“Selection and justification, using technical analysis, of one design option from those presented in Chapter 4, based on the design consideration criteria and Requirements. Clear and systematic explanation given of how this design meets all requirements and best meets the criteria.”

- A/A+: Design selected from chapter 4 is thoroughly and technically compared to each other. Advantages & disadvantages are evaluated. One is selected and compelling justification is provided. A+ is faculty level / journal quality

- B: Design selected from chapter 4. Sufficient justification provided, some meaningful comparisons made to other options

- C: Design is selected from chapter 4. Sufficient justification is provided, but a rigorous comparison to other options is lacking.

- D: Design selected from chapter 4, but justification is insufficient.

- F: Design selected is not listed in chapter 4 and/or no meaningful justification provided

- F-: Completely omitted or no useful content
5. Design Selected

5.2 Design Description

“Complete, clear specifications for the design selected, including engineering drawings, 3D models, parts and materials, process diagrams (e.g., flow, IDEF0), facility layouts, etc., as appropriate. Specifications clearly explained and well justified using appropriate engineering methodologies.”

- A/A+: Complete description / sizing, with appropriate technical justification, of each component of the design. When combined with the content of an A/A+ chapter 6, the description is such that another team of senior ME/IME students, using only the content of this report, could create the design (e.g. build the prototype). A+ is faculty level / journal quality

- B: Major components fully specified and technically justified, but some minor components description and/or justification is lacking detail.

- C: Major components critical features specified and technically justified, some less-than-critical features left unspecified. Minor components description lacking.

- D: Some major components critical features are unspecified and /or unjustified.

- F: Most or all major components critical features unspecified and /or unjustified.

- F-: Completely omitted or no useful content
6. Implementation  
(for Final Proposal)

“Complete, clear description of implementation plan. Detailed breakdown of all resources needed. Complete bill of materials, if appropriate, in Appendix, unless short. Sourcing, costs and budget. Detailed schedule of all implementation tasks”.

A/A+: Complete description of how design will be implemented (i.e. how the components of 5.2 will be created or acquired and integrated into a functioning prototype) including BoM (if appropriate), sourcing, costs, budget, and schedule. When combined with the content of an A/A+ 5.2, the description is such that another team of senior ME/IME students, using only the content of this report, could create the design (e.g. build the prototype). A+ is faculty level / journal quality.

B: As A/A+ for major components, but some missing elements (manufacturing plans, BoM entries, sourcing, costs) for minor components. Schedule may be lacking detail.

C: As A/A+ for critical features of major components, but some missing elements for less-than-critical features and/or minor components. Schedule lacks detail.

D: Significant elements missing for critical aspects of major components.

F: Most or all elements missing for critical aspects of major components.

F-: Completely omitted or no useful content.
6. Implementation
(for Final Report)

“Complete, clear description of actual implementation. Final engr. drawings, 3D models, bill of materials, process diagrams, facility layouts, etc., and engineering analyses, if changes were made between Final Proposal and Testing. Photographs of prototype, if appropriate. Project budget with actual expenses. Descriptions of problems encountered in implementation and how they were resolved ”.

- A/A+: Clear, technical description of implementation of design described in the Final Proposal (FP) incl. drawings, models, diagrams, budget vs. expenditures, EBOM, and photographs (as useful). The following provided for all changes from FP occurring during implementation: (i) technical motivation, (ii) supporting engr. calculations, (iii) technical drawings, (iv) actual / expected impact on performance, budget, etc. A+ is faculty level / journal quality

- B: As A/A+, but lacking completeness / thoroughness (e.g. minor drawings missing, some technical motivation / justification for changes is lacking)

- C: All / nearly all elements of A/A+ are present, but significant technical content is lacking in terms of motivation, justification, and description.

- D: Multiple key elements are missing (e.g. no motivation for changes, no supporting calculations, no drawings of changes, no budget discussion, etc)

- F: Entire sections missing (e.g. no discussion of implementation of FP or changes made)

- F-: Completely omitted or no useful content
7. Testing

“Description of how each design requirement was tested according to the Testing Procedures of section 2.3. For each test failed, a compelling technical argument as to why success was expected is provided. For each test failure a detailed and technically justified redesign given, including supporting engineering calculations and drawings as necessary.”

- A/A+: For each testing procedure, referencing section 2.3, a description is given, a thorough explanation is provided of how the actual test run was conducted, results of the test are given and technically analyzed as appropriate, pass/fail is clearly indicated. If failed, a compelling technical argument is provided as to why success was expected. For each failure, a redesign is provided including technical justification and drawings. A+ is faculty level / journal quality

- B: As A/A+ but lacking thoroughness (e.g. some technical rigor lacking in arguments / justifications, some drawing detail is missing)

- C: All / nearly all elements of A/A+ are present, but significant technical content is lacking in terms of why success was expected or why redesigns will work.

- D: Multiple key elements are missing (e.g. no description of actual test runs, no meaningful discussion of test results, no discussion of redesigns for failures)

- F: Entire sections missing (e.g. no mention of redesigns for test failures)

- F-: Completely omitted or no useful content
Clarity and Conciseness

“Clear, concise, and focused; main ideas stand out; supporting details and references are effective and relevant. Writing is free of padding with no unnecessary repetition.”

- A/A+: Polished, controlled writing. Sentence meaning clear on first reading. Details and references enhance arguments, and modifiers increase sentence precision. Wordy constructions (e.g., “It is/there are...” sentence starts) are infrequent. Sentence length correlates with message complexity (long sentences reserved for complex ideas). A+ is faculty level / journal quality.

- B: Point of sentence apparent, but some rearranging would help. Arguments are effective, but could be made more so with additional detail & references. Sentence length is appropriate for content, and words are used effectively.

- C: Reads like a rough draft. Sentences are relevant, but may require effort to understand. Arguments are more-or-less effective, but may be weak, with some misplaced details. Some awkward sentence construction.

- D: Some sentences irrelevant, others difficult to understand. Incomplete, ineffective arguments. Appears text was added simply to increase word count.

- F: Large sections of text are incomprehensible.

- F-: Large sections of text are missing.

Focus here is on sentence-level issues; Issues of organizational clarity are covered in following section.
“Effective sequencing and paragraph breaks. Writing is easy to follow. Writing includes smooth, effective transitions among sentences, paragraphs, and ideas. Details fit where placed.”

- A/A+: Sections begin with introductory text. Paragraphs begin with topic sentence; middle sentences expand topic; ending sentences summarize & transition. Bulleted/numbered lists used appropriately & correctly. Transitional language guides idea flow. Tables, figures & appendices constructed and captioned properly and introduced/addressed in text. A+ is faculty level/journal quality.

- B: Section introductions, paragraph and list structure, and table, figure, & appendix use are handled properly, but frequently could be improved.

- C: Most sections begin w/ intro sentence/paragraph. Paragraph structure exists, but topic sentences may be weak & transitions sometimes absent. Lists, tables, figures, appendices used, but referencing & captioning only minimally sufficient.

- D: Intro sentences/paragraphs weak or frequently absent. Paragraph structure is evident, but topic sentences or summary/transition sentences are consistently absent. Tables, figures, and appendices not referenced/captioned.

- F: Sections lack introductory sentences or paragraphs. No effective paragraph structure. Lists, tables, figures, appendixes are not used or used inappropriately.

- F-: Large sections of text are missing.
Conventions

“Writing shows control of standard writing conventions (punctuation, spelling, capitalization, grammar, and usage) and uses them effectively to enhance communication. Errors are few and minor.”

• Based on number of errors, text appears to have been proofread.
• Sentences are complete and grammatically correct.
• Punctuation is used correctly (is in the right place and enhances clarity).
• Acronyms are spelled out at first mention.
• When a sentence begins with a number, the number is spelled out.
• Proper nouns are capitalized and all other nouns are lowercased.
• Sentence subjects and verbs agree.
• Verb tense choices are appropriate.

• A/A+: Always or almost always yes to all. A+ is faculty level / journal quality
• B: Usually yes, no obvious errors
• C: Usually yes, but some obvious errors
• D: Occasionally yes
• F: Rarely / never yes
• F-: Large sections of text are missing
Citing Sources

“Significant claims cited in text and listed in References using format given in course syllabus. Tables and figures cited correctly in text. Few omissions or errors.”

• Aside from common-knowledge, information from external sources is cited.
• Supporting external evidence is provided for all claims / conclusions requiring it.
• Cited sources enhance report and author credibility.
• Except in section 1.2, borrowed information is paraphrased, not directly quoted.
• In-text citations and Reference List entries conform to a technical format.
• The Reference List includes all sources cited in text, and no additional sources.
• Tables, figures, and images borrowed from other sources are properly cited.

• A/A+: Always or almost always yes to all. A+ is faculty level / journal quality
• B: Usually yes, no obvious errors
• C: Usually yes, but some obvious errors
• D: Occasionally yes
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