

BAE 402/403- Senior Design

SUMMARY OF DESIGN STEPS

BAE 402

- Step 1: Define the problem
- Step 2: Search and re-search
- Step 3: Generate Alternative Concepts
- Step 4: Evaluate and Select a Concept

BAE 403

- Step 5: Detail the Design
- Step 6: Fabrication and Testing
- Step 7: Evaluation of the Overall Design
- Step 8: The Final Design Report

FORMAT FOR WRITTEN REPORTS

Prepare your midterm and final reports for an interdisciplinary group of decision makers affiliated with the company or agency with which you are collaborating. You can assume such a group includes executive officers, accountants, salespersons and other specialists as well as engineers.

Your written reports must be formatted into different section headings (listed below). For each quarterly report, the contents of each section will include details about what you have completed and how you plan to complete the work discussed in each section, where the amount of each will change from report to report, until the final report discusses all of the completed work.

I will need to make copies of your reports throughout the year. For this reason, you are required to turn in all reports in a 3-ring binder. I expect the 3-ring binder to be of appropriate size. You are not to use section dividers. All Appendices should start on a new page.

Introductory Pages

- Cover Page : title, authors, audience, data (the cover page for the final report **must** follow AGCO guidelines and it **must** be signed by all team members)
- Table of Contents, List of Tables, and List of Figures

Executive Summary (brief summary of the ENTIRE report)

Background (Step 1 & Step 2)

- Explain circumstances leading to problem recognition
- Discuss previous work related to the problem and its significance (Cite at least 5 references)
- Explain benefits of solving the problem, including motivation economics
- Present a clear and concise definition of the problem

Proposed Solution (Step 3 & Step 4))

- Present design requirements (quantitative)
- Discuss alternative approaches considered (strengths/weaknesses)
- Describe preferred solution – in general and the rationale for selecting this solution

Design Approach and Fabrication (Step 5 & Step 6)

- Describe methods of analysis and synthesis to be used to refine your preferred solution into a final design, which is ready to be fabricated. Discussion of statics, dynamics, hydrology, heat transfer, thermodynamics, electronics, etc of your design would be appropriate here.

Describe how the prototype will be (or was) fabricated or constructed
Provide detailed drawings and specifications
Describe the final product to be delivered and include design economics

Testing and Evaluation (Step 6 & Step 7)

Explain methods of prototype testing and design evaluation (experimental design)
Describe experimental design
Provide performance data
Discuss results

Conclusions

Overall discussion of your design and its performance
Production economics
Final recommendations

Bibliography

Cite references using the ASABE Style Guide and follow format suggested for illustrations, tables, and equations.
http://www.asabe.org/pubs/29_References.html

Appendix A: Organization (all reports)

Key personnel and qualifications to develop the proposed design
Work plan and responsibilities
Facility capabilities
Timetable of design development (Gantt chart)

Appendix B: Details of Design Calculations (all reports)

These details should complement the information given in the main report. These are not to be thought of as “hand calculations”. You should make sure these details are formally presented.

Appendix C: Detailed Drawings (all reports)

These drawings should be professionally formatted.

Appendix D: Sound Engineering Design Discussion (403 reports)

Include all of the following: economic; environmental; sustainability; manufacturability; ethical; health and safety; social and political You can cut & paste from the main report for the aspects that are also included in the main a body of your report. These should be listed under the sub-heading “Main Considerations”. The remaining aspects should be discussed under the sub-heading “Additional Considerations”.

Appendix E: Statistical Discussion (Final 403 Report)

You can cut & paste from the main report, but this section must stand alone. You may also include additional details about your statistical test that may not be appropriate in the main report.