

AME40463: Senior Design Project – Spring 2010

ENGINEERING TRADE STUDY

The engineering trade study is an individual deliverable. The study takes place in two phases. The first involves the submission of a brief proposal to assist the student in planning the study. The proposal will be graded and every effort will be made to return it promptly and indicate if there are concerns about the scope or structure of the study. The student should not wait until the proposal is returned to begin the study but may want to use the proposal evaluation to alter elements of the study and she/he is free to do so.

The study must produce quantitative information that can be used to assist in making engineering design decisions for your platform and must indicate how that information influenced design decisions for the platform.

Trade Study Proposal (due Feb. 9)

The proposal is a one-page-maximum typed (12 pt font) document that should explicitly include:

1. Statement of the purpose/goals of the study.
2. List of the design and state (behavioral) variables, constraints and design parameters – they need not be quantified at this time.
3. Brief description of the analysis, simulation or experiments to be used in the study to generate state information.
4. Information that you will develop using the source/s listed in Item 3 (above).
5. Decisions that the study is expect to influence.
6. Task plan for the study (key milestones and schedule)

The proposal is due in hardcopy form prior to the beginning of the all-class meeting at 9:30 a.m.

Trade Study Report (due Feb. 23):

The trade study report should contain the following readily identifiable and explicitly stated items:

1. Statement of the purpose/goals of the study.
2. Detailed description of the information gathered, tests conducted, engineering analysis performed or simulation tools used with particular emphasis on the assumptions associated with them in this particular application.
3. Presentation of the results of the study - graphical results are preferred but tables or charts are acceptable if they adequately represent the results.
4. Detailed discussion of the interpretation of the results of the study.
5. Discussion of the impact of the study on the design.

The basic format for the presentation of the trade study is up to each student. A technical memo format might be ideal. The entire report should not exceed 6 pages (12 pt font). The report is due in hardcopy form prior to the beginning of the all-project meeting at 9:30 a.m. An electronic version of the report in pdf format should be emailed:

To: batill@nd.edu

Email Subject Line: YOURLASTNAME

File Name: YOURLASTNAME

Individual Engineering Trade Study Proposal - Evaluation Criteria

Engineer: _____ Rating: _____

Possible Total Rating - 15 pts

- | | |
|--|-------|
| 1. Concise statement of the purpose of the study (1) including: | 5 pts |
| a. Explicit statement of design variables (1) | |
| b. Explicit statement of states or behavioral variables (1) | |
| c. Explicit statement of constraints on DV or states (1) | |
| d. Explicit statement of required design parameters (1) | |
| 2. Description of the analysis, simulation or testing methods to be used to generate the information to be used in the study | 3 pts |
| 3. Description of the <u>quantitative</u> information that will be developed and used | 2 pts |
| 4. Explicit indication of the design decision/s the study could influence | 2 pts |
| 5. Explicit indication of schedule and key milestones for the study | 2 pts |
| 6. One page, typed document | 1 pt |

Comments:

AME40463 Senior Design Project: Spring 2010
Individual Engineering Trade Study - Evaluation Criteria

Submitting Engineer's Name: _____

Rating (out of 30 pts) _____

1. Brief summary of purpose and goals of study [3] _____
 - 0 - no mention of purpose
 - 1 - purpose implied but not explicit
 - 2 - purpose stated but not specific or useful to assess role of study
 - 3 - clear statement of purpose and anticipated influence of study on design

2. Description of quantitative information sources used in the study [3] _____
 - 0 - no mention of sources of information (analysis, simulation, experiment, etc.)
 - 1 - some indication of sources but no mention of assumptions or limitations on info
 - 2 - effective indication of sources but no mention of assumptions or limitations on info
 - 3 - effective description of information sources, assumptions and limitations on information

3. Explicit statement of design and behavioral (state) variables [3] _____
 - 0 - no obvious consideration of these concepts
 - 1 - an indication of one or the other but not both
 - 2 - a "shopping list" of either or both and difficult to determine which were used in the study
 - 3 - effective identification of both design variables and states used in the study

4. Explicit statements of parameters and constraints on states and DV [3] _____
 - 0 - no obvious consideration of these concepts
 - 1 - some, qualitative only, indication of parameters and constraints on states or DVs
 - 2 - some quantitative constraints indicated for states and DVs and some parameters indicated
 - 3 - effective justification of useful constraints for appropriate states and DVs and all parameters indicated

5. Presentation of the information gathered (i.e. the results) [3] _____
 - 0 - no explicit presentation of results from analysis, simulation or other information sources
 - 1 - presented only "raw data" or data without appropriate units, legends, sources
 - 2 - excessive or inadequate data/information but effectively presented
 - 3 - concise tabular or graphical presentation with labels and legend that support results

6. Discussion of the usefulness and accuracy information (i.e. the results) [9] _____
 - 0 - no discussion
 - 3 - general discussion of results
 - 6 - some use of the information to identify trends but identification of key issues left to reader
 - 9 - concise discussion that highlights key issues/trends effectively substantiated by information provided

7. Discussion of the influence of the results (i.e. decisions made) [3] _____
 - 0 - no mention of impact of study on concept design
 - 1 - some attempt but unable to identify how the design was influenced
 - 2 - indication of impact but no justification based upon information included in the study
 - 3 - concise statement of influence study (positive, negative or neutral) and quantitative validation

8. Overall presentation of study [3] _____
 - 0 - lacks format, organization or structure – individual sections not indicated
 - 1 - some structure, "fluffy" text, vague descriptions of key issues or poor proofreading
 - 2 - reasonable structure, effective written text, limited use of appropriate figures/tables/graphs, not concise
 - 3 - professional presentation of text, figures, tables, etc.