

Fuel Cell Technology: REPORTING REQUIREMENTS

Quarter Proposal and Safety Plan (due week 2 of the quarter)

Your proposal should be no longer than 3 pages and include the following sections:

- **Description of previous work** should include a brief description of the student design report to be built during the first weeks of the quarter. Include a description of the stack and components and note any important recommendations made that might impact how things will proceed.
- **Timetable and Task Assignments** for the quarter. This plan should include a specific task list and schedule for the following broadly defined tasks: (1) building a 2-cell stack, to be completed by week 5 of the quarter, (2) testing the stack (during week 6 of the quarter) and reporting the results, (3) redesigning the stack, and (4) oral presentation of the redesign and submission of the final report (week 10). Also, a team leader should be identified (must be a ME495 student) and student roles should include how ME499 student projects will support the overall design effort.
- **Safety Plan** should be a brief specification of hazards and an approach to mitigating them.

Stack Test Report (due week 6 of the quarter)

Testing should include the preparation of a “polarization and power curve” at various level of one of the following parameters: mass flow of air, temperature of inflow air, relative humidity of hydrogen, and relative humidity of air. Your report should be no longer than 3 pages and include a brief description of the procedures and results.

Design and Engineering Reports

Midterm reports **due week 7 of the quarter** and final reports **due week 10 of the quarter**

M E 495 Design Report Requirements

One report per team is required and should expect to use ME499 reports as appendices, referred to in the text of the design report. As described below, the **midterm design report** should only contain the “Introduction” portion of the *Design Project Description* and citations, and appendices as needed. Also described below, the **final design report** must include a cover letter, title page, executive summary, table of contents, and design project description (including the introduction incorporating the instructor’s comments provided on the midterm design report).

Executive Summary

The executive summary should be one to two pages long. It should be a self-contained, specific description of the design project capturing the most important points in the proposal. It may contain graphics if appropriate.

Table of Contents

The table of contents should direct the reader to the pages for all sections of the report, beginning with the *Design Project Description*.

Design Project Description

The *Design Project Description* should consist of 6 sections: (1) an introduction, (3) an embodiment design, (4) contribution to the class business plan, (5) recommendations for future work, (6) citations, and (7) appendices.

1. Introduction (include in **midterm** and final design reports)

Describe the prototype and findings from the stack build in weeks 1-5 and the testing in week 6. Make redesign recommendations. You should formulate your recommendations to include (a) a problem statement, (b) the results of benchmarking relevant solutions to problems found or to improve performance (including/ based on a functional decomposition), (c) an analysis of design requirements and related performance metrics/ engineering characteristics, and (d) a brief description of proposed design concepts.

2. Concept Selection (include in the final design report)

Evaluate the design concepts based on the performance metrics, and select and justify your superior design concept(s).

3. Embodiment Design (include in the final design report)

For the embodiment design, you should include sections describing for the superior design concept(s): (a) the product/ system architecture (e.g., appropriate schematic diagrams, a geometric layouts, and drawings), (b) product/ system modeling and simulation results (c) product/ system cost analysis results, (d) reliability analysis results, (e) comments on manufacturability, quality, and legal and ethical issues, and (f) an parts list including for each part the materials it will be made of, how it will be made, and a depiction of assemblies if appropriate.

4. Contribution to the Class Business Plan (include in the final design report)

Develop aspects of a business plan for your superior concept(s) as it contributes to the overall class design project. Guidance, information and templates that can be used to prepare a business plan can be found at on the course website.

5. Recommendations for Future Work (include in the final design report)

Provide recommendations with enough detail so that teams working next quarter have a good jumping off point (this is almost a proposal for next quarter).

6. Citations (include in **midterm** and final design reports)

Each of the major sections of the *Design Project Description* must contain discussions of the relevant technical and academic literature. The literature must be formally cited. All citations should be complete as described at <http://wally.rit.edu/pubs/guides/apa.html>

7. Appendices (include in **midterm** and final design reports)

Include appendices as specified in the body of the report. For example, include the engineering reports prepared by team members taking ME 499.

ME499 Engineering Report Requirements

As described below, the **midterm engineering report** must include the “Introduction” portion of the *Project Description* and citations as needed. Also described below, the **final engineering**

report must include a title page and engineering project description (including the introduction incorporating the instructor's comments provided on the midterm engineering report).

Engineering Project Description

The *Engineering project Description* consists of 4 sections: (1) an introduction, (2) results and discussion, (3) recommendations for future work, and (4) citations.

1. Introduction (include in **midterm** and final engineering reports)

This section provides a clear statement of the proposed engineering project. You should begin with a brief discussion of what will be presented in the introduction, and then include the following sections:

- **Problem Statement.** Your problem statement should be a summary of the problem statement and important information provided above.
- **Literature Review.** An introductory statement should be followed by an analysis of existing solutions. You should search patents and archival literature to identify existing solutions.
- **Engineering Concepts.** An introductory statement should be followed a description of at least 2 possible solutions to the problem at hand, an evaluation of the solutions, and the selection and justification of a superior solution(s).

2. Results and Discussion (include in the final engineering report)

This section will present the results of your work and a related discussion. Include methods and equations used and consider placing tables of numerical results, computer code and outputs, and photographs in the appendices.

3. Recommendations for Future Work (include in the final engineering report)

Provide recommendations with enough detail so that teams working next quarter have a good jumping off point (this is almost a proposal for next quarter).

4. Citations (include in **midterm** and final engineering reports)

Each of the major sections of the *Engineering project Description* must contain discussions of the relevant technical and academic literature. The literature must be formally cited. All citations should be complete as described at <http://wally.rit.edu/pubs/guides/apa.html>