Rubric for Grading of Final Written Design Reports in CH402

Title Page __/1
- Title of report
- Name and number of course in which report is submitted
- Names and addresses of all authors
- Date

Table of Contents __/3

Executive Summary __/6
- States what the deliverable is.
- Briefly presents results in a clear and concise manner.
- Is your process feasible, economical and environmentally sound?

Introduction __/30
- Provides a clear statement of the problem.
- Discusses why it is interesting.
- Discusses how this process has been designed has.
- Provides important results obtained from references.
- States what the results of your study show.
- Five to ten paragraphs in length.

Summary __/10
- One page summary of the general technical features on your design.

Discussion __/70
- Detailed discussion of the technical features of your design.
- Discussion of the details of the reactor design.
- I/O diagram, cash flows in and out, and discussion.
- Functions diagram and discussion.
- Table of utilities flow rates and costs.
- Table of equipment and equipment costs.
- Discussion of economics.

Conclusions __/10
- Is your design economical and environmentally sound?

Recommendations __/10
- Discusses whether or not the project should go to next level.

Project Premises __/20
- States the assumptions of your work.

Heat and Material Balance __/20
- Table of all feed, products, side-products, and wastes.
- Table shows flow rates, cost per unit, and total costs.
- Is the overall mass balance closed?
- Is the overall energy balance closed, and if not, what is Δ?

FTR Unit Process Flow Diagram __/45
- ChemCAD process flow diagram of the reactor section.
- ChemCAD process flow diagram of the separation section.

- ☐ Shows modifications made to the syngas unit.

Simplified GTL Plant Process Flow Diagram __/20
- ☐ Illustrates heat integration between units in the GTL plant.
- ☐ Shows stream flows & compositions between all units in the plant.

Safety & Environmental Summary __/40
- ☐ Table of LFL, UFL, and LD50 values for all hazardous materials.
- ☐ NFPA fire diamonds for each section of the plant.
- ☐ ChemCAD environmental report with explanation.
- ☐ ChemCAD report is fully formatted.

Equipment Information Summary __/20
- ☐ Table of all equipment in process.
- ☐ Table includes equipment number from ChemCAD.
- ☐ Table includes cost of equipment.
- ☐ All costs in 2013 dollars.

Unit Control and Instrumentation Description __/40
- ☐ Location of all analyzers in process (sensors).
- ☐ Location of all control valves in process (actuators).
- ☐ Identification of most important control sensors.
- ☐ Method for controlling thermal load (runaway).

Economics __/40
- ☐ Analysis of the discounted cash flow rate of return
- ☐ Calculation and discussion of ROI.
- ☐ Summary of operating costs.
- ☐ Table of all utilities requirements.
- ☐ Include all utility costs and credits (Handout p.11).
- ☐ Summary of energy efficiency.

Engineering Calculations __/40
- ☐ Includes all Mathematica sheets.
- ☐ Includes method for simplifying kinetics for ChemCAD.
- ☐ Includes pressure drop calculations.
- ☐ Includes thermal loading calculations in reactor.

Appendix __/60
- ☐ Detailed equipment reports from ChemCAD for each unit in process
- ☐ Includes enough information to determine the cost of the equipment.
- ☐ For Distillation, this includes column profiles, tray compositions, tray properties, and sizing report.
- ☐ For heat exchangers, include “UnitOps” data from “Report”
- ☐ For heat exchangers, include summary data from CCTherm if available.
- ☐ For flash units, include “UnitOps” data from “Report” and sizing data.

Total (sum of above)	____/485
Total (normalized to 400 points)	____/400