

**Assessment Rubric: Interim Design Report**

The first semester design report project is a required component of CHBE 411, a course taken by all CHBE majors. We are including the report in the student portfolio to provide assessment data relevant to program outcomes **c** and **h**.

- **c** ...an ability to design a system, component, or process to meet desired needs.
- **h** ...the broad education necessary to understand the impact of engineering solutions in a global and societal context.

This assessment rubric is designed to help evaluate student performance relative to these outcomes.

**Outcome c. ...ability to design a system, component, or process to meet desired needs.**

Outcome element	Unacceptable (0)	Marginal (1)	Acceptable (2)	Exceptional (3)	Points
Clearly articulated need that is to be addressed by the design.	No need is indicated.	Need stated incompletely or ambiguously.	Statement of need is made, but some improvement is possible.	Clearly articulated statement of need.	3
Does the proposed design meet the need?	No evidence that the proposed design will meet the stated need.	Reader must infer how the design will meet the need.	It is apparent that the design will meet the stated need, but could be presented better.	The utility of the design in meeting the stated need is well communicated as part of the presentation.	2
Has the group assembled a logical and practical sequence of integrated unit operations?	The proposed design sequence cannot achieve the intended result.	The proposed design sequence will likely work, but design has significant shortcomings.	The proposed design sequence appears to be a reasonable approach to accomplishing the intended task.	The proposed design sequence exhibits a high degree of innovation.	2
Has the group integrated knowledge from multiple courses or sources?	No evidence of knowledge presented.	Minimal integration is evident; the bulk of the design comes from one field of study.	The students have successfully incorporated information from multiple courses.	The students have successfully incorporated information from multiple sources, including sources beyond the classroom.	3
Has safety been considered appropriately in the design?	Obvious safety problems with the proposed design.	The design appears to be potentially safe, but safety awareness is poorly articulated in report.	Safety awareness has clearly been a part of the proposed design.	The design is innovative in building safety into the proposed process.	2
Has the design been presented clearly?	The report is difficult to comprehend, full of errors, or fails to communicate clearly.	The design is presented, but lots of room for improvement.	The reader can easily grasp the technical features of the proposed design.	The proposed design is presented in a way that is both technically correct and highly readable.	3

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### Assessing the assessment tool...

After completing the assessment of the transport projects, please complete the following items on a fresh assessment form.

This assessment rubric was: [useless] -- | -- [marginal] -- | -- [helpful] -- | -- [awesome]

Suggestions for improving this tool...

On the report:

In general, very good. My concern would be lack of introspection & risk analysis. Obvious concerns in the design are:

- size of reactor/mixing challenges
- Soap formation in trans reactor due to residual FFA
- Challenges in glycerol distillation, polymerization, product quality
- Vapor emissions
- Source of heat/cooling
- Final disposition of neutralized catalyst stream

Assignment ID: PETII

*Al-Zayed  
Halligan  
Perkins  
Shogren  
Soo*

Reviewer Name: John Berg

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Has the group integrated knowledge from multiple courses or sources?	No evidence of knowledge presented.	Minimal integration is evident; the bulk of the design comes from one field of study. ✓	The students have successfully incorporated information from multiple courses.	The students have successfully incorporated information from multiple sources, including sources beyond the classroom.	1
Has safety been considered appropriately in the design?	Obvious safety problems with the proposed design. <i>PSM. Safety is at end of covers PPE, etc. but not hazards of process.</i> ✓	The design appears to be potentially safe, but safety awareness is poorly articulated in report.	Safety awareness has clearly been a part of the proposed design.	The design is innovative in building safety into the proposed process.	0
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*Notes:  
Not a  
LP?  
HP1*

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Where did 50% waste recovery come from?

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Suggestions for improving this tool...

say 3.5

Outcome element 5, safety, could have some specific concerns such as PSM safety (disaster prevention), PPE safety - (personal safety), health protection - is the chemistry benign or hazardous?

Generally, I enjoyed this report - informative and fairly complete. It looks as though the team did some digging for their information and were fairly successful. A question for them might be, "Did you sit together and discuss the project all together and challenge yourselves about whether it would work, could it be improved, etc?"

Assignment ID: Biomass Conv. to Green Fuels by  
gasification & F-T Synthesis

Reviewer Name: Jim Hall

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Missing  
Energy  
IN/out  
Summary.

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Suggestions for improving this tool...

None.

I felt report was well written & presented. The important thing missing was a summary of the energy balance of the proposed process plant. How much energy (net) gained to US would be a very important metric for any green fuels project. Minor omissions include equipment to generate the 20 bar pressures for the FT reactor, plant utilities, etc

Assignment ID: \_\_\_\_\_

Reviewer Name: JULIE MORMAN

"BIODIESEL PRODUCTION FROM ANIMAL FAT"

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ANALYZED

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Suggestions for improving this tool...

G • OUTCOME H - ONLY 1 ASSESSMENT → PERHAPS COULD BE BROKEN INTO SEVERAL (SEE ABOVE)  
IT WAS DIFFICULT TO COMBINE ALL ELEMENTS INTO 1 RESPONSE.

A) NO ADDITIONAL COMMENTS

B) & C) "THE COMPLETE PROCESS" pg 6 ~~WAS NOT~~ DID NOT PROVIDE ENOUGH INFORMATION.  
(FIG. 4)  
- SUBSEQUENT SECTIONS SHOULD REFER TO PROCESS BY STEP FOR EASE OF NOMENCLATURE.  
- RECYCLE STREAMS NOT SHOWN  
- PRETREATMENT STEP VAGUE  
- WASTE DISPOSAL NOT SHOWN

D) "WORKS CITED" (p29) APPEARS ROBUST WITH VARIOUS POINTS OF REFERENCE & CONSIDERATION.

E) "SAFETY" SECTION (p7-8) WAS BRIEF & DID NOT APPEAR TO BE THOROUGH.

F) OVERALL SATISFACTORY



Assignment ID: Sewage to Bioplastic - Fall 2007

Reviewer Name: Rod Ray

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Suggestions for improving this tool...

- It would be good to have room/rating for writing style/english quality.
- It would be good if they had a section analyzing whether or not the process as a whole makes sense : - energy  
- feed stock vs products - even on a tonnage basis.
- of course economics, even though that's out of scope
- Tool is useful
- very hard to assess given lack of economics & <sup>overall</sup> energy/value analyses.