IPR2 – Due Monday 1 May by 1630.

Requirements:

- 30 to 60-minute appointment
- Team leader plus any available team members.
- Appointments are in Room 441, not during class or lab time.
- Be prepared to discuss highlights of work to date.
- PowerPoint or other written documents (draft) will be considered.
- The grading rubric for the project will be used for assessment.
- For scoring purposes, expected levels of attainment are highlighted in yellow in the attached rubric. For example, in column 1 design, groups are expected to attain a score of 7. A score of 7 will be interpreted as 100% in that column.

Grading rubric standards are shown on pages 2-4 below.

Level	Design [SO2,8]	Design [SO2,8]	CHEMCAD [SO2,8]	CHEMCAD [SO2,8]	Control [SO2,8]
1	Cadet design works but is primitive and lacks creativity or is missing major steps.	Understanding of design constraints is weak or leads to poorly designed equipment or processes. See Note 1.	Cadets developed a *working* flowsheet model to accomplish design. Feed stream is *correctly* specified.	Process flow sheet is working, but one or more major features of the design are missing.	At least one control point has been described for each major portion of the process.
5	Cadet design works and cadets have incorporated realistic constraints, but design is not fully optimized or is missing minor steps.	Cadets incorporate design constraints into a plausible design scheme but the degree to which the constraints are satisfied is weak or unclear.	Cadets developed a flowsheet model that incorporates rigorous column design to include tray number, feed location and sizing for each unit.	Process flow sheet models process but one or more minor features are missing.	Control points in the process have been identified and described but minor detail is missing, leading to potential safety issues.
	7	7	7	7	7
10	Cadets design achieves constraints, is optimized, and incorporates and energy integration.	Cadets produce working design that meets or exceeds all design constraints and specific production needs.	Cadets produce rigorous column design that includes design of condensers, reflux drums, and reboilers.	Cadets produce rigorous flowsheet design that includes all required ancillary equipment. See Note 2.	Major control points and relief devices in the process identified and described. Control strategies are safe.

Rubric notes:

1. Boiling point constraints and development of realistic constraints for chloride and water content and methods to reduce these.
2. Ancillary equipment includes pumps, compressors, supplemental heat exchanges, and the like, required for a realistic design.
3. All levels and quality of performance are determined by the instructor.
4. Cadets may ask for clarification at any time during the grading process.
5. Instructor will provide cadets with periodic updates of the rubric scores during the IPRs.
6. The number of columns in this rubric does not indicate weighting in final grade.
7. “SO” stands for Student Outcomes for the chemical engineering program.

Cadets: Date:

Level	Communication [SO3]	Communication [SO3]	Context [SO4]	Economics [SO4]	Environmental [SO4]
1	Report is missing major sections, or errors in fact or grammar detract significantly from the meaning of the content.	Important plot(s) or flow diagram(s) are missing from the report, or visual presentation confuses the content.	Response to Part 2 is weak or missing one of the three required idea for closing the "gaps."	Important economic measures (such as PBP, ROI, NPW, and DCFR) are missing or incomplete	Assessment submitted but is minimal or is missing major sections or important sources of information.
5	All major sections are included, but factual or grammatical errors detract significantly from the meaning.	Flowsheets, graphs, and tables present but are missing features or information that detracts from the meaning of the report.	Cadets have responded to each of the three "gaps," but responses are ambiguous or weak.	Cadets have calculated economic measures but have minor errors or unrealistic results.	Environmental issues have been identified, valid sources of information have been employed, but interpretation is weak or needs additional work.
	5	5	7	5	7
10	All sections are included and are well-written and clear.	Flowsheets, graphs, and tables are presented in a clear and professional style.	Responses to all three gaps in Part 2 are thorough and include an analysis of social context.	Cadets have calculated economic measures and have assessed them against appropriate benchmarks.	Assessment is complete and comprehensive. Major important sources and tools have been employed and interpreted.

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Cadets: Date:

Level	Safety [SO4]	Health [SO4]	Problem Solving [SO1]	Technical [SO1]	Research [SO7]
1	HAZOP analysis and safety audit were submitted but are missing important information.	Analysis of human exposure factors is incomplete, and analysis is minimal or lacking.	Students identify problems that must be solved to produce working design.	Understanding of underlying principles limits ability to achieve working design.	Students are unable to identify information needed to address the design problem.
	1				
5	HAZOP analysis and safety audit are essentially complete, but one or more important omissions or errors in interpretation.	Students have identified human exposure risk factors, but analysis lacks rigor or is missing information.	Students identify problems that must be solved to produce a working design and develop formulations or solutions.	Level of understanding of key theoretical concepts produces minor design inconsistencies, or key theoretical information is lacking or incomplete.	Students identify information gaps or areas where research is needed to address the design problem and find enough information to proceed with project.
		7	7	7	7
10	HAZOP analysis and safety audit are complete. Assessment is comprehensive.	Identification and discussion of human exposure factors is comprehensive and summarized in a concise fashion.	Identification, formulation, and solution of problems is complete, creative, and efficient.	Level of understanding of key theoretical concepts results in a working and plausible design.	Areas requiring research are clearly explained in the final report. Student research is thorough, carefully presented, and correctly documented.

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Cadets: Date: