

Undergraduate Curricular Program Assessment Plan

Program Name: BS Chemical Engineering

Applicable Major(s)/Degree(s): B.S.Ch.E.

Date: 2 Feb 2018

Section 1: Program Learning Outcomes and Assessment Methods

This table summarizes all program learning outcomes and related details for each outcome. Program learning outcomes identify what students will know and do as a result of completing the program. *Note: The BSChE PLOs use the precise language of Student Outcomes required by the Engineering Accreditation Commission of ABET <http://www.abet.org/accreditation/accreditation-criteria/accreditation-alerts/>.*

Program Learning Outcome(s)	Campus SLO Alignment	Assessment Year	Assessment Methods/Measures	Performance Indicators
1. identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	1	2017-2018	Exams: ChE 4111, 4301, 4402, 4501 Rubric Standard: Ability to solve numerical problems	70% of the students are at or above standard
2. apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	2	2018-2019	Exams: ChE 4111, 4301, 4402, 4501 Rubric Standard: Ability to design a separator or reactor Reports: ChE 4211, 4501, 4502 Rubric Standard: Ability to design a process or product within safety and environmental constraints	70% of the students are at or above standard
3. communicate effectively with a range of audiences [3a = writing; 3b = presentations]	6a; 6b	2017-2018	a) Reports: ChE 4211, 4501, 4502 Rubric Standard: Ability to use standard business English to compile information and prepare written documents, that include appropriate flow charts, graphs, spreadsheets b) Presentations: ChE 4211, 4502 Rubric Standard: Ability to plan, prepare, and deliver an oral presentation with appropriate visual aids, and/or other support materials	70% of the students are at or above standard
4. recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	4	2018-2019	Reports: ChE 4211, 4501, 4502 Rubric Standard: Ability to abide by the AIChE code of ethics and behaviors by evaluating and applying the merits, risks, and social concerns of engineering solutions to problems, including uncertainty analysis, citation of work, material SDS, environmental impact	70% of the students are at or above standard

Program Learning Outcome(s)	Campus SLO Alignment	Assessment Year	Assessment Methods/Measures	Performance Indicators
5. function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	6c	2017-2018	Reports: ChE 4211, 4502 Rubric Standard: Ability to lead a team, plan, distribute workload fairly and ethically, receive reports, modify plans, problem-solve to complete projects Presentations: ChE 4211, 4502 Rubric Standard: Ability to contribute on a team presentation and present results from area of responsibility	70% of the students are at or above standard
6. develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	3	2018-2019	Exams: ChE 4111, 4301, 4402, 4501 Rubric Standard: Ability to use and interpret tabulated or graphical forms of data to solve a problem Reports: ChE 4211, 4501, 4502 Rubric Standard: Ability to design an experiment to collect and analyze appropriate data to test a hypothesis, solve a problem, or design.	70% of the students are at or above standard
7. acquire and apply new knowledge as needed, using appropriate learning strategies	5	2018-2019	Reports: ChE 4211, 4501, 4502 Rubric Standard: Ability to assimilate new knowledge and technology into a process or product design	70% of the students are at or above standard

Section 2: Program Assessment Data Analysis and Results

In this section, information is provided regarding who conducts the program's assessment, who compiles assessment data, who reviews assessment results, and general ways the program uses assessment results to improve teaching and learning. Information includes ways in which students and individuals/groups outside of the program are involved in the program's assessment process, if applicable.

Program assessment is conducted by all members of the faculty under the leadership of the department head. Instructors compile assessment data from exams, reports, and presentations. The faculty meets at least annually (usually at the end of the spring semester) to review the assessment data, analyze the results, and create plans from improvement. Plans may involve modifying existing or developing new student learning activities in courses, adding or removing program requirements, or changing assessment practices.

Students participate in the assessment through group advisement where assessment plans are shared and exit interviews with graduating students for indirect measures of achievement of student outcomes.

The Chemical Engineering Department meets annually in the fall semester with an external industrial advisory committee. The committee receives a report of the program assessment results and advises on plans for continuous improvement and curriculum.

Section 3: Alignment of Courses to Program Learning Outcomes

This table lists all courses taught for the program and shows the alignment with the program learning outcomes.

- Courses are listed in order by course level, beginning with 1xxx courses.
- * denotes required courses.
- Course-to-program learning outcome alignment is noted as: K = Knowledge/Comprehension, A = Application/Analysis; E = Evaluate/Create
- Courses used as part of Program Assessment are noted by: P = Program Assessment Reporting.

Course Number	Course Title	Program Learning Outcomes						
		1 Solve	2 Design	3 Communicate	4 Ethics	5 Teams	6 Experiments	7 Learning
1011*	Introduction to Chemical Engineering	K	K	K	K	A	K	K
2011*	Design of Engineering Experiments	K	A	K	K	K	A	K
2121*	Thermodynamics	K	K		K		K	
2211*	Material and Energy Balances	K	K		K		K	
3031*	Computational Methods	K	A	A	A		A	A
3111*	Fluid Mechanics	A	A		K		A	
3112*	Heat and Mass Transfer	A	A		K		A	
3211*	ChE Lab I	A	E	E	A	A	A	A
3231*	Properties of Materials	K	K		K		K	A
3241*	Particle Technology	K	K		K		A	
4111*	Separations	A, P	A, P	A	A		A, P	
4211*	ChE Lab II	A	E	E, P	E, P	E, P	E, P	E, P
4301*	Reactor Design	A, P	A, P	A	A		A, P	
4402*	Process Dynamics and Control	E, P	A, P	A	A	A	A, P	
4501*	Chemical Process Design I	E, P	A, P	E, P	A, P	A	A, P	A, P
4502*	Chemical Process Design II	E, P	E, P	E, P	E, P	E, P	E, P	E, P
4xxx	Technical Elective	K	K	K	K			A