I= Introduced
R= Reinforced
M= Mastered

Program Learning Outcomes

Program Name: Biochemistry & Molecular Biology

Date: 5/12/2020

Program Learning Outcomes Knowledge, skill, or behavior students can demonstrate upon program completion		Courses Mapped to Outcomes					
		Chem 311 Biochemistry I	Chem 314 Biochemistry II	Chem 315 Biochemistry Lab	Bio 366 Molecular Bio and Lab	Chem 343 Physical Chemistry I	Chem 345 Physical Chem Lab I
1	Fundamental Knowledge: Students will demonstrate knowledge in all major fields of chemistry (analytical, biochemistry, inorganic, organic, and physical) and in broad biological topics (organismal, cellular, molecular and genetic levels of biological organization).	R	M	M	R	R	R
2	Practical Skills and Safety: Students will show understanding in the theory and practice of laboratory techniques and major instrumentation, and will use safe procedures in a biology, chemistry and biochemistry laboratory.	R	R	M	M	R	M
3	Analytical Skills: Students will demonstrate problem-solving skills, biological and chemical information skills (including reading the lit) and computer/computational skills.	R	R	R	M	M	M
4	Scientific Inquiry Skills: Students will demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data. Students	R	R	R	M	R	M

	will express confidence in their abilities to engage in scientific inquiry.						
5	Scientific Communication Skills: Students will show proficiency in scientific communication including laboratory notebooks, laboratory reports, research proposals, journal articles, oral and poster presentations, and working in groups.	R	R	R	R	R	M
6	Professional outcomes: Students will demonstrate an understanding of the connections between biochemistry and other science disciplines. Students will have a successful transition to their post-college activities.	I	R	M	R	R	R

Program Learning Outcomes: Assessment Tools

Program Name: Biochemistry & Molecular Biology

Date: 5/12/2020

Program Learning Outcomes Knowledge, skill, or behavior students can demonstrate upon program completion		Measurement Tool	Timeline/Frequency of Assessment	Target	Review
1	Fundamental Knowledge: Students will demonstrate knowledge in all major fields of chemistry (analytical, biochemistry, inorganic, organic, and physical) and in broad biological topics (organismal, cellular, molecular and genetic levels of biological organization).	a. ACS (American Chem Society) Exams: Chem 125/6 and 131 (gen chem), Organic 255, Biochemistry 314, Phys Chem 343. Elective upper courses (322-Inorg, 331-Analyt). b. American Society of Biochemistry and Molecular Biology (ASBMB) Final exam (national)	a. Every year b. Students take ASBMB exam Senior year	Chem 125/6: average above 50th percentile 314: average above 65th percentile Bio: Cohort will score at or above the 70th percentile (Percentiles determined by comparative numbers published by ETS). ASBMB: National rules (National passing grade~50% Hope passing grade~80%).	ACS report every 6 yrs ASBMB exam scores reviewed annually-compare to national scores ASBMB Reaccreditation-every 6 yrs
2	Practical Skills and Safety: Students will show understanding in the theory and practice of laboratory techniques and major instrumentation, and will use safe procedures in a biology, chemistry and biochemistry laboratory.	Safety Training and Safety Training Quiz ACS standardized exams include questions about instrumentation	Safety: Offered every semester and in summer. ALL research active students and TAs (teacher Assistants) must do once a year.	All TAs and research students must successfully complete safety test	Check/Record every year
3	Analytical Skills: Students will demonstrate problem-solving skills, biological and chemical information skills (including reading the lit) and computer/computational skills.	Lab reports in Biochem 315: a. Thinking critically and analytically b. Analyzing numerical and statistical information c. Journal club in MoBio d. Computer skills in MoBio Lab	Annually	Cohort average of 3.75 on 4-point scale. Bio: Cohort average of 3.75 on 4-point scale	Results (scores) reviewed every three years by faculty during department meeting in fall semester

4	Scientific Inquiry Skills: Students will demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data. Students will express confidence in their abilities to engage in scientific inquiry.	National Survey of Student Engagement (NSSE): a. Thinking critically and analytically b. Analyzing numerical and statistical information c. Design and implementation of multiweek experiments in MoBio Lab	Students complete NSSE survey during freshman and senior years. Results will be requested from Frost Center a. Chem: Proposals for research project and reports in elective upper courses b. Bio:	Biochem: average above 65th percentile Cohort average of 3.25 on 4-point scale	Results (scores) reviewed every three years by faculty during department meeting in fall semester
5	Scientific Communication Skills: Students will show proficiency in scientific communication including laboratory notebooks, laboratory reports, research proposals, journal articles, oral and poster presentations, and working in groups.	Student attendance at seminar (seminar reports) Participation in dissemination events such as CURCA, public talks, publications, conferences/professional meetings Poster presentation in MoBio Lab, Journal club in MoBio	Annually	~50% of chemistry and biology students write a seminar report. ~80% of students participate in CURCA 75% of cohort will participate in at least one dissemination activity	Annual review by faculty during department meeting in fall semester
6	Professional outcomes: Students will demonstrate an understanding of the connections between biochemistry and other science disciplines. Students will have a successful transition to their post-college activities.	Student attendance at divisional seminars (seminar reports) Student participation and attendance at CURCA and national meetings. (Post-graduation outcomes are tracked by the department with the support of the alumni office.)	Annually	Anticipate ~100% job and postgraduate studies placement	Annual review at departmental retreats