

Academic Department Student Success Plan Update 2015-2018

Department: Chemistry and Physics

Department Chair: Eric Glendening

Department Mission: The Department of Chemistry and Physics provides comprehensive, student-centered education leading to bachelor's degrees in chemistry and physics. Students gain knowledge and problem-solving skills through rigorous lecture and laboratory course work as well as through challenging independent research experiences. We are committed to preparing students to pursue careers as scientists, engineers, teachers, and health professionals. We contribute to the scientific literacy of students in other disciplines through our general education courses. Faculty advance knowledge through their own research and provide service to the University and scientific communities, as well as to the public.

Department Freshmen (1st year) Retention¹ Goal(s):

Ensure that students are adequately supported in their 100-level chemistry and physics courses, and engaged with peers and faculty in the discipline, so that they continue to pursue their desired career paths.

Action Steps (with dates & person(s) responsible):

- a. Continue to offer a preparatory course in chemistry (CHEM 101) for students who need to complete the science majors' level general chemistry (CHEM 105/106) but lack the appropriate background in chemistry to succeed. Attempt to correlate performance on the first CHEM 105 exam with final grades so that we can somewhat more aggressively encourage at-risk students in CHEM 105 to switch to CHEM 101. Target date for completion: May 1, 2016. Persons responsible: CHEM 101/105 instructors (Gilbert, Glendening, Jeewandara, Moody, Rosenhein)

- b. Continue to offer workshops in general chemistry (CHEM 105/106) and pilot workshops in general physics (PHYS 105/106) to strengthen students' problem-solving skills and to foster strong peer-peer relationships that enhance the likelihood of success in these and advanced courses in chemistry and physics. Target date for completion: May 1, 2017. Persons responsible: 105/106 instructors (French, Gilbert, Glendening, Jeewandara, Mikula, Moody, Noll, Rosenhein, West, Zhang)

- c. Fund and organize the Chemistry and Physics Help Center, a free, drop-in tutoring service for students in freshman- and sophomore-level chemistry and physics courses. Target date for completion: May 1, 2016. Persons responsible: Michelle Baltz-Knorr, Eric Glendening, Steve Wolf

¹ Departments w/o undergraduates can adapt the retention and persistence to completion sections to serve their graduate student success purposes or alternatively, integrate into the Other Goal(s), Action Steps, and Benchmarks of focal interest to department section at the end of the template.

d. Provide space for student-run organizations in the Department, including the American Chemical Society Student Members and Society of Physics Students. Provide wifi access to students in the ACS room. Target date for completion: May 1, 2016. Persons responsible: Brendon Mikula, Steve Wolf

e. Provide student employment opportunities in the Department, including positions as Science Help Center tutors, teaching assistants, laboratory assistants, and stockroom assistants. Also, broaden efforts to recruit highly qualified student workers. Target date for completion: May 1, 2016. Persons responsible: Michelle Baltz-Knorr, Eric Glendening, Steve Wolf

<i>Retention Benchmarks²</i>	Fall 2012 Cohort:	Fall 2013 Cohort:	Fall 2014 Cohort:
(by latest department)	84.38%	69.57%	62.50%
	Fall 2015 target:	Fall 2016 target:	Fall 2017 target:
	64%	66%	68%

Other Freshmen Retention related benchmarks of focal interest to department³

Click here to enter text.

Department Persistence to Completion Goal(s):

- Increase the number of students completing the chemistry or physics major by 3% each year.
- Ensure that 80% of sophomore chemistry and physics majors complete the undergraduate degree within four years.
- Ensure that 75% of graduating chemistry and physics majors have had an undergraduate research experience and that at least half of these students have the opportunity to present their research at a professional meeting.
- Support professional development activities so that the faculty remains current in the disciplines.

Action Steps (with dates & person(s) responsible):

² Department level current and historical retention and completion benchmark data to be integrated into the plan can be found through Blue Reports: <http://irt2.indstate.edu/cms/ir/blue-reports/>. Default is "latest department"; change to "original department" if that is the desired benchmark data.

³ A retention and completion rate is an essential benchmark, but it is not necessarily the only benchmark of interest to a department. Others of interest to the department can be integrated as well.

a. Provide opportunities for 15-20 students to participate in chemistry and physics research in the Summer Undergraduate Research Experiences (SURE) program, and expand opportunities for undergraduate research during the academic year. Target date for completion: May 1, 2016. Persons responsible: Rick Fitch, Eric Glendening, Joe West

b. Ensure that at least half of students participating in the SURE program complete sufficient work to present the results of their research at a regional or national meeting. The Department, Dean's Office, Center for Student Research and Creativity, and the local section of the American Chemical Society will provide travel support. Target date for completion: May 1, 2017. Persons responsible: SURE faculty (Fitch, Flurkey, Glendening, Inlow, Mikula, Noll, Van Hoveln, West, Wolf, Zhang)

c. Schedule chemistry and physics classes to meet demand for coursework in the physical sciences and facilitate degree completion for all students. The schedule will ensure that all of the 100-level service courses in chemistry and physics (except PHYS 101 and 115/116) are offered every semester, and ensure that chemistry and physics majors have the potential to complete the degree, for certain concentrations, within three years. Target date for completion: May 1, 2016. Person responsible: Eric Glendening

d. Offer on-line courses in CHEM 100/L and PHYS 105/L beginning Fall 2016. Target date for completion: December 31, 2016. Persons responsible: Michelle Baltz-Knorr, Bill Flurkey, John Moody, Brendon Mikula, Joe West

e. Consider using OpenStax (free, open-source) textbooks for CHEM 101/105/106 and PHYS 105/106 courses. Consider purchasing departmental licenses, if available, for electronic homework packages used by students in these courses. Target date for completion: May 1, 2016. Persons responsible: 101/105/106 instructors (French, Gilbert, Glendening, Jeewandara, Mikula, Moody, Noll, Rosenhein, West, Zhang)

f. Consider student performance in the chemistry and physics majors and propose mechanisms for fast-fail or gatekeeping that help direct a student out of the major before it becomes essentially impossible for the student to complete the major. Target date for completion: May 1, 2017. Persons responsible: chemistry advisors and physics faculty (Flurkey, French, Inlow, Mikula, Noll, Rosenhein, West, Zhang)

g. Request that academic advisors in other disciplines (particularly in COT and NHHS programs) encourage their advisees to complete all 100-level chemistry and physics requirements as early as possible in their undergraduate career. Target date for completion: May 1, 2016. Person responsible: Eric Glendening

h. Complete degree audits for all majors at 60 hours and 90 hours to ensure that students are progressing satisfactorily toward graduation. Target date for completion: May 1, 2017. Persons responsible: chemistry and physics advisors (Flurkey, French, Inlow, Noll, Rosenhein, West)

i. Support faculty development by sponsoring travel to attend chemistry and physics teaching conferences, including the Biennial Conference on Chemistry Education (BCCE) and meetings of the American Association of Physics Teachers (AAPT). Target date for completion: May 1, 2017. Person responsible: Eric Glendening

<i>Completion Benchmarks</i>	Fall 2009 Cohort:	Fall 2010 Cohort:	Fall 2011 Cohort:
(by latest department)	66.67%	35.29%	38.71%
	Fall 2015 target:	Fall 2016 target:	Fall 2017 target:
	41%	44%	47%

Other Persistence to Completion related benchmarks of focal interest to department

[Click here to enter text.](#)

Other Goal(s), Action Steps, and Benchmarks of focal interest to department⁴:

⁴ Departments may have student success related goals, action steps, and benchmarks that do not fit neatly into the other categories. If so, feel free to place them here.