CLAS Deans' comments on
BS in Chemistry, Accredited Program Report
BA in Chemistry, Non Accredited Program Report
Reviewer: Michael Cornebise, Associate Dean

Last report submitted by department: Fall 2020 (Initial Assessment Plan).

Even though the BS in Chemistry program is accredited (by the American Chemical Society-ACS), the department has chosen to employ the assessment template in addition to providing ACS accreditation information. One reason is because the BA in Chemistry is not an accredited program and the department assesses each program in tandem. The 4-year assessment report is comprehensive and draws from multiple data points to measure 8 program learning goals. Assessment instruments include scores on the ETS Major Field test, reflective items on exit surveys, alumni survey data, grades in foundational courses, and writing, speaking, and research rubrics. Results are shared with the department's assessment committee and then distributed to the faculty as a whole for further discussion and reflection. In reviewing assessment data, the department noted a high level of participation in undergraduate and graduate research that exceeded expectations. Exit and Alumni survey data indicate that the students and alumni believe they have received a comprehensive and quality education. The department is working to improve their assessment procedures through better communication with instructors to fill gaps in the data and to explore ways to enhance alumni survey return rates.

Academic Affairs –Review & Feedback
B.S./B.A. Chemistry
The B.S. and B.A. in Chemistry programs should be commended for approaching the assessment process with a clear eye on improving the student experience—both in coursework and in professional preparation. The data gathered indicate very high levels of performance, preparation, and satisfaction. The programs focus on continuous improvement, not only in meeting accreditation standards (the B.S. in Chemistry), but also in increasing awareness and participation in faculty assigned to key chemistry courses.

3/8/23

VPAA Office Dr. Suzie Park Date

Appendix I. Collected Assessment Data.

Number of BS Chemistry graduates 2018-2022: 11 (4 in 2021-2022; 3 in 2020-2021; 3 in 2019-2020; 1 in 2018-2019)

Number of BA Chemistry graduates 2018-2022: 7 (1 in 2021-2022; 2 in 2020-2021; 0 in 2019-2020; 4 in 2018-2019)

SLO's

Part I

Learning Goal #1	Program Learning Goal(s) Students understand the fundamental principles and applications in all subdisciplines of chemistry.
How are learners assessed?	a) Grades in foundation courses (2310, 2440, 2730, 3300/3450, 3910) and in in-depth courses (2840, 3460, 3780, 3920, 4900) as applicable. Will be collected at end of each semester. (b) Scores on ETS Major Field test, administered to graduating seniors in SP semesters. Fall graduates will be tested in the SP prior to degree completion. (c) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (d) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) 75% of students obtaining an A or B grade on first attempt. (b) For all students, scores of ≥ 50th percentile. For BS chem, chem students, ≥ 50th percentile on remaining 3 subdisciplines. For BS chem, management and BA students, ≥ 35th percentile on the remaining 3 subdisciplines. (c) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (d) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	a) Foundation: BS: 2310 = 100% (n=11), 2440 = 83% (n=6*), 2730 = 73% (n=11), 3450 = 91% (n=11), CHM 3910 = 82% (n=11) BA: 2310 = 86% (n=7), 2440 = 60% (n=5*), 2730 = 57% (n=7), 3450 = 72% (n=1), 3910 = 72% (n=11) In-Depth: BS: 2840 = 100% (n=7), 3780 =82% (n=11), 3920 = 72% (n=11), 4900 = 100% (n=11) BA: 2840 = 50% (n=6*), 3780 = 25% (n=4)**, 4900 = 100% (n=2)** b) BS: Overall score ≥ 50th percentile = 75% (n=4); Subdiscipline scores ≥ 50th percentile = 75% (n=4) for 3 of 4 subdisciplines, for inorganic was 100% ≥ 50th percentile BA: Overall score ≥ 50th percentile = 0% (n=3); Subdiscipline scores ≥ 50th percentile = 33% (n=3) for analytical and physical chem, 0% for inorganic and organic c) Average = 4.33 (n=6)† d) Average = 4.50 (n=6)†
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Learning Goal #2	Program Learning Goal(s) Students are able to execute experiments in chemistry.
How are learners assessed?	(a) Grades in laboratory courses of 2445, 2730, 2845, 3455, 3780, 3915, and 4915, as applicable. Will be collected at end of each semester. (b) Grade in research course CHM 4400, as applicable. (c) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (d) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) 75% of students obtaining an A or B grade on first attempt. (b) 75% of students obtaining an A or B grade on first attempt. (c) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (d) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	a) BS: 2445 = 83% (n=6*), 2730 = 73% (n=11), 2845 = 83% (n=6*), 3780 =82% (n=11), 3915 = 82% (n=11), 4915 = 80% (n=10***) BA: 2445 = 43% (n=7), 2730 = 57% (n=7), 2845 = 43% (n=7), 3455 = 0% (n=1)**, 3780 = 25% (n=4)**, 3915 = 0% (n=1)** b) BS: 100% (n=10)**, BA = 86% (n=7) c) Average = 4.50 (n=6)† d) Average = 4.50 (n=6)†
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Learning Goal #3	Program Learning Goal(s) Students are able to critically analyze data.
How are learners assessed?	(a) Rubric scores from instructors on 1 selected student report in CHM 2845, 3455, 3780, 3915, and 4915 as applicable. Scores will be provided by end of semester course taken. (b) Critical thinking component of Major Field Test (c) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (d) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) 75% of students obtaining score of ≥ 2.5 (on 4pt scale). (b) Mean percentile correct ≥ national mean. (c) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (d) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	a) 2845: 100% (n=15); 3455: n/a; 3780: 100% (n=16); 3915: 73% (n=11); 4915: 100% (n=6) b) Percentile correct 36.5, national mean percentile = 41.3 c) Average = 4.00 (n=6)† d) Average = 5.00 (n=2)†
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Learning Goal #4	Program Learning Goal(s) Students are able to utilize computer applications.
How are learners assessed?	(a) Rubric scores from instructors on 1 selected experiment as specified in following items: (1) use of spreadsheet / graphing / plotting programs in CHM 2730 and 3915; (2) use of word processing software in CHM 2845, 3780, and 3915; (3) use of structure drawing software in CHM 2845; (4) computational chemistry packages in CHM 1315, 2845, 3915. Scores will be provided by end of semester course taken. (b) Seminar evaluation items on use of structure drawing software and presentation software in CHM 3001 and 4001. Scores will be provided by end of semester course taken. (c) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (d) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) 75% of students obtaining score of ≥ 2.5 (on 4pt scale). (b) Average response of ≥ 2 on seminar evaluation, where 1 = needs improvement and 3 = excellent. (c) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (d) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	a) (1) 2730 = 82% (n=17); 3915 = 91% (n=11); (2) 2845 = 100% (n=15); 3780 = n/a; 3915 = 91% (n=11); (3) 2845 = 100% (n=6)‡; (4) 1315 = 66% (n=3); 2845 = 100% (n=6)‡; 3915 = 73% (n=11) b) BS Average 3001 = 2.48 (n=11), 54% ≥ 2.5; 4001 = 3.00 (n=11), 64% ≥ 2.5 BA Average 3001 = 2.16 (n=5), 60% ≥ 2 c) Average = 4.33 (n=6)† d) Average = 2.50 (n=2)†
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Learning Goal #5	Program Learning Goal(s) Students can properly use chemical information and database sources.
How are learners assessed?	(a) Rubric scores from instructors on 1 exercise as specified in following items: (1) SciFinder and journal databases, including PubChem, in CHM 2845, 3450, 3500, and 4915; (2) use of Protein Database and NIST database in CHM 3450 and 3500. Scores will be provided by end of semester course taken. (b) Seminar evaluation items on sources used in CHM 3001 and 4001. Scores will be provided by end of semester course taken. (c) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (d) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) 75% of students obtaining score of ≥ 2.5 (on 4pt scale). (b) Average response of ≥ 2 on seminar evaluation, where 1 = needs improvement and 3 = excellent. (c) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (d) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	a) (1) 2845 = 100% (n=1)‡; 3450 = n/a; 3500 = 94% (n=18); 4915 = 100% (n=6); (2) 3450 = n/a; 3500 = n/a b) BS Average 3001 = 2.44 (n=11), 45% ≥ 2.5; 4001 = 2.80 (n=11), 63% ≥ 2.5 BA Average 3001 = 2.16 (n=5), 20% ≥ 2.5 c) Average = 4.33 (n=6)† d) Average = 4.00 (n=2)†
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Learning Goal #6	Program Learning Goal(s) Students will generate and contribute to the process of expanding new knowledge and data in the field.
How are learners assessed?	(a) Participation in CHM 4400 Undergraduate Research. Will be collected at end of each semester. (b) Participation in summer research experiences, including internships or CoOPs. Will be collected at end of each semester. (c) Published abstracts for presentations or posters at external meetings. Will be collected at end of each semester. (d) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (e) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) For BS Chem, chem majors at least 70% of majors completing 1 semester of 4400; at least 50% of majors completing. For BS chem, management and BA students at least 50% of majors complete 1 semester of 4400. (b) At least 15% of majors involved in a summer experience. (c) At least 50% of students listed on at least 1 abstract. (d) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (e) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	(a) BS: 91% (n=11), BA: 100% (n=1). Note average semesters 4400 taken for BS = 2.6 times; for BA 2.1 times. Also for 1 BS not doing 4400, this student engaged in research at UIUC while taking EIU courses. (b) BS: 45% (n=11), BA: 29% (n=7) (c) BS: 82% (n=11), BA: 0% (n=7) (d) By mistake, this item was not included on the surveys sent out (not most up-to-date survey used). (e) Average = 4.00 (n=2)
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Learning Goal #7	Program Learning Goal(s) Students will communicate effectively in speaking and writing.
How are learners assessed?	(a) For speaking, 3 items on the back page of CHM 3001, 4001 seminar evaluations (b) For writing, seminar evaluation item on abstract for CHM 3001 and 4001. (c) For writing, rubric scores from instructors on 1 report from CHM 2845, 3780, 3915, and 4915, as appropriate. (d) For speaking, published results from speech rubrics in CMN1310G and EIUXXX. (e) For writing, rubric scores submitted by CHM faculty instructors. (f) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (g) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) Average response of ≥ 2 on seminar evaluation, where 1 = needs improvement and 3 = excellent. (b) Average response of ≥ 2 on seminar evaluation, where 1 = needs improvement and 3 = excellent. (c) 75% of students obtaining score of ≥ 2.5 (on 4pt scale). (d) averages of ≥ 3.2 in CMN1310G and ≥ 3.6 in EIUXXX. (e) average of ≥ 3.3. (f) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (g) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	a) BS Organization: CHM 3001 Average = 2.47 (n=11), 100% ≥ 2; Delivery: = 2.35 (n=11), 100% ≥ 2; Visual Aids: 2.44 (n=11), 100% ≥ 2; For 4001 Average of 3 items = 2.63 (n=11), 82% ≥ 2 BA Organization: Average 3001 = 2.24 (n=5), 80% ≥ 2 Delivery: Average 3001 = 2.03 (n=5), 50% ≥ 2 Visual Aids: Average 3001 = 2.16 (n=5), 80% ≥ 2 b) BS Average 3001 = 2.12 (n=11), 73% ≥ 2; 4001 = 2.73 (n=11), 100% ≥ 2 BA Average 3001 = 2.13 (n=5), 100% ≥ 2 c) 2845 = 93% (n=15); 3780 = n/a ††; 3915 = 73% (n=11); 4915 = 100% (n=6) d)† CMN1310G 2022 = 2.75 ; 2021 = 3.59; EIUXXX 2022 = 4.00; 2021 = 4.00 e) this is repeat of item (c) and should be removed f) Speaking: Average = 4.17 (n=6), Writing: Average = 4.00 (n=6)†

	g) Speaking: Average = 5.00 (n=2), Writing: Average = 4.50 (n=2)
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Learning Goal #8	Program Learning Goal(s) Students will be aware of practiced in working safely.
How are learners assessed?	(a) Completion of CHM 3500. (b) Reflective items on exit surveys to graduating seniors, to be completed by the end of their last semester of courses. (c) Reflective items on alumni surveys sent to students who graduated 3- and 8-yrs prior. Surveys will be sent in late SP or over SU.
What are the expectations?	(a) 100% of majors complete (b) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree. (c) Average response of ≥ 3 on 5pt scale, where 1 = strongly disagree and 5 = strongly agree.
What were the results?	a) BS = 100% (n=11), BA = 100% (n=7) b) Average = 4.67 (n=6)† c) Average = 5.00 (n=2)
How are the results shared? How will these results be used?	Results are shared first through the assessment committee, and then distributed to the faculty as a whole.

Notes

***** some majors transferred in with credit for these courses at their initial institution, thus their grade omitted for this expectation

** BA degree does not require all students to take these courses (count as an elective). For BS, 4400 is an elective.

*** due to limited number majors that year / timely completion of degree, 1 student had this course substituted for CHM 4400 research

† previously assessment items did not include field to indicate degree type

†† data not available due to miscommunication with instructor

‡ due to COVID, for some semesters students were not required to use software since computer lab closed

Summary and Comments:

Overall the assessment data shows that Chemistry BS and BA majors have developed the identified skills at high levels, and as a whole the program is successful in molding graduates ready to become professional chemists. It is especially good to see high results in goal 2 (the ability to execute experiments in chemistry), 3 (critically analyze data), 4 (use computer applications), 5 (use chemical databases), and 7 (communication skills). We were also very pleased to see a high level of participate in research, and exceeding the expectations with regards to summer experiences and inclusion on an abstract. The results from the exit interviews of graduating seniors and alumni survey demonstrate the student themselves recognize this development and success, and overall our majors are receiving a comprehensive and quality education.

In most cases, the results for the BS Chem majors are higher than the BA Chem majors, especially at the higher level courses. We believe this is simply a reflection of the greater number of chemistry courses taken by the BS majors, where key skills are reinforced. Likewise, the successful completion rate in the majors courses usually increased as the course level increased, suggesting the development of our majors both in terms of chemical reasoning and ability as well as their professional development. That being said, the BA majors were still strong students and the compromise of number of courses in lieu of flexibility (the ability to double major / minor / take significant number of courses outside of chemistry) is not something measured here.

It should be noted that the return rate for exit surveys was 6/8 (75%). It is hoped that with a return to all in-person classes it will be easier to find in person those not completing the survey and persuade them to fill it out. Also the return rate on the alumni survey was low 2/8 (25%) – we introduced an online option (Qualtrics), and plan to implement reminders, though are considering how to do this without impacting the anonymity of the survey.

Additionally, both the exit survey as well as the new course assessment reports initially did not specify major, so the data for the BS/BA chem majors could not be pulled from the total response of majors (which also includes BS Biochem and BS Teacher Licensure); this has been remedied.

One area of improvement needs to be communication of these assessment markers with the instructors early in the semester, to be sure that the data is collected and/or the exercise is done. As some of these goals were new, and new instructors were assigned the courses, there were places where results were missing (so for instance, item 5a for CHM 3450 and CHM 3500). This should be accomplishable.

With regard to specific items

Learning Goal 1.a. Some of our majors transfer in with these courses taken at other institutions, and thus they are not counted here. The low percentiles for major field test is a reflection of several factors, including the disconnect between a national test versus our curricular emphasis, the time since the students last took a course in that area (so for instance, most students take organic in 2nd year but the major field test is in the 4th (or 5th yr)), and for the BA, that these students don't take all the courses in the area (so for instance, they only take 1 semester of inorganic while the BS majors take both semesters).

Learning Goal 6c. The COVID pandemic undoubtedly had an impact on these numbers, as there was approximately 1 yr where there were few to no chemistry conferences going on.

ACS Chemistry for Life

Periodic Report Summary

Periodic Report for Eastern Illinois University - 10/31/2022

Institution Information	Chairperson	Dean or Provost
Eastern Illinois University Department of Chemistry	Edward Treadwell emtreadwell@eiu.edu	Jay Gatrell Provost & Vice President for Academic Affairs jgatrell@eiu.edu

Degrees offered: Bachelor's;Master's
Academic calendar: Semester

Weeks of instruction (per Semester): 15

Accredited by: North Central Association of College and Schools, and Council for the Accreditation of Educator Prepardness

Departmental Budget & Autonomy

Is the department an independent unit? Yes

Budget

Are the department expenditures, excluding grants (internal and external), salaries, and library costs, greater than $60,000 dollars annually?
No

Describe how the institution supports the department in meeting its teaching, infrastructure, and faculty development needs.

The institution supports teaching in a number of ways, including generous CU release for both external grants (typically 3 CU), research students (0.4 CU/student), thesis (0.75 CU/student), special CUs for special roles (gen chem coordinator, grad coordinator, NMR coordinator), and having CU loads of 18-24 for tenured and 18-21 for non-tenured faculty. Each year Redden grants can be applied for, to provide limited support (~$1750) for a teaching-related project or need (FY21 Dept secured 4 grants). There are both a robust and helpful Faculty Development and Innovation Center, that provides both lectures for improving teaching as well as assisting with online course website (D2L) and developing online courses. Classroom computers are supported and maintained by ITS.

Additional faculty development opportunities include participation in a mentoring program, support for travel for pre-tenured faculty, and assistance by the Office of Research and Sponsored Programs in seeking, preparing, running external grants. Each year tenured faculty can apply for a Special CU release (3 or 6 CU) to devote additional time for research. There are multiple internal research grants that both students and faculty can apply for, as well as some support for student and faculty travel.

Infrastructure is supported by contributions by both the College and Academic Affairs for new faculty hire start-up packages, as well as assistance in finding funds for particularly large emergency needs. Our Facilities Planning and Management has a wide variety of trades to maintain and upgrade classrooms / labs / Dept space, and for the most part, repairs are done without charge. There is some funneling of indirect costs from external grants back to the Dept.

	Current	6-year Average
Operating, not including salaries	[redacted]	[redacted]
Instrument maintenance & repair	[redacted]	[redacted]
Student & faculty travel	[redacted]	[redacted]
Internal grant	[redacted]	[redacted]
External grants	299,054	157,717

Students

Enrollments for most recently completed academic year

Entire campus	Undergraduates	Chemistry majors, seniors	Chemistry graduate students
8,608	4,625	8	7
In all chemistry undergraduate courses		459	

Placements

Graduate school: 16
Professional school: 5

Employment

Placements for graduates over the last 6 years

Industry	12	**Teaching**	7
Government	0	**Self employed**	0
NGO	0	**Seeking employment**	3
Nonprofits	1	**Unknown**	5

Placements in other sectors

One student was a student-athlete, who played soccer in Europe after graduating. The second student took a food server job at a restaurant. 2

Faculty

Gender Distribution

Category	Type	Total	Number with PhD	Male	Female	Nonbinary
Full Time Faculty	Associate Professor	1	1	1	0	0
Full Time Faculty	Associate Professor	3	3	3	0	0
Full Time Faculty	Full Professor	5	5	4	1	0
Full Time Faculty	Instructor	3	3	1	2	0

Category	Type	Total	Number with PhD	Male	Female	Nonbinary
Part Time Faculty	Tenured	1	1	1	0	0

Faculty (continued)

Race/Ethnicity

Category	Type	Hispanic/ Latinx	Asian American	American Indian or Alaska Native	Black or African American	Pacific Islander or Native Hawaiian	More than one race
Full Time Faculty	Associate Professor	0	0	0	0	0	0
Full Time Faculty	Associate Professor	0	0	0	0	0	0
Full Time Faculty	Full Professor	0	0	0	0	0	0
Full Time Faculty	Instructor	0	0	0	0	0	0

Category	Type	Hispanic/ Latinx	Asian American	American Indian or Alaska Native	Black or African American	Pacific Islander or Native Hawaiian	More than one race
Part Time Faculty	Tenured	0	0	0	0	0	0

Faculty (continued)

Please describe any activities that your program has engaged in over the previous 6 years to recruit, retain, and welcome a diverse faculty, student body, and staff. In addition to racial and ethnic diversity, you may also want to include faculty members that identify as a person with a disability, or identify as LGBTQIA+, or were first generation college students.

Unfortunately, despite our efforts and with faculty departures in review period (in part due to budget crisis in state as well as adjustment of retirement policy), our faculty diversity has decreased. We have had 4 faculty searches over this period (3 successful), and for each, our Dept made sure to pay to advertise in underrepresented organizations (eg, SACNAS, NOBCCHE) in addition to the general underrepresented postings done by our Office of Civil Rights. We have made sure the screening committees had both at least one female and one non-Caucasian on it (even when this meant calling on someone outside the Dept), and have tried to be diversity aware in reducing the applicant list down to short lists. This has resulted in good representation in terms of final candidates brought in for visits, but our location and limited resources fight against us successfully attracting the best candidates. New faculty are given an in-house introduction packet, and there is a University New Faculty Orientation program as well as a mentoring program to help new hires become aware of all University resources.

Our Dept has faculty who participate in iSTEM (inclusion in STEM), and before that, WISM (Women in Science and Mathematics), and Dept support is leant to these organizations as well. We are careful to have diversity displayed when assembling recruiting and retention materials.

More recently we have tried to raise awareness of gender diversity amongst the faculty, following efforts of our EIU Diversity and Inclusion initiatives.

Please describe the role of temporary faculty in student instruction.

We hire temporary faculty as needed and allowed by administration, to cover courses in areas where a faculty member has left / is on leave / is on sabbatical. Most all of these hires do have PhDs, and some have previous teaching experience. Most will do 2 semesters (1 academic year) of teaching. Additionally, some of these temporary faculty are emeriti.

Faculty Salaries

Full professor - 80,000
Associate professor - 73,000
Assistant professor - 68,000
Instructional faculty - 57,000

Faculty Sabbaticals and Leaves of Absence

Number Requested: 5
Number Granted: 4

Support Staff

Administrative staff	1
Stockroom - Managers/Employees	1
Instrument Technicians	0
Laboratory Coordinators	0

Staff in other roles? 0

Please comment on whether the number of staff in these roles is adequate for your program's needs. Comment on the number of student workers hired and their general duties.
Our office manager has a split appointment with another Dept, so she only works 50% for us. This was a result of Illinois's severe budget crisis, and we are continually asking administration to restore a full-time office manager to our Dept. We typically hire 1-2 federal student workers a semester to have a front-office presence during the academic year, but this does not completely cover the other 50% of the time the office manager is not there. Their responsibilities typically include answering/directing questions and calls, photocopying, and other filing/office tasks. The Chair's office is in the main office, and they do spend a lot of time there.
Again pre-budget crisis, we had 2 full-time staff in the stockroom which has been reduced to 1 person. With that reduction in staff, a number of the duties of the stockroom manager were shifted either to faculty (eg, liquid N2 fills on NMR) or chair (eg, balancing budget spreadsheets). The Provost did provide for 1 additional GA (10hrs/week) to help with stockroom, where they prepare solutions / lab materials, clean labs between days, etc. This has mostly worked and while it would be nice to someday have a 2nd person back in the stockroom, we are getting by well enough without them.
We have one faculty member serve as the Graduate Coordinator, and another serve as the General Chemistry Coordinator. Two faculty share NMR Coordinator duties, and all of these roles are associated with CUs. Maintenance and supervision of department instruments are divided between the faculty themselves, and every semester there is a 1 CU Instrument Coordinator given to 1 faculty member to help with improving / updating instrument.

Teaching Assistants

What is the maximum number of students in a lab section that are directly supervised per faculty member or TA?
24

Do you use teaching assistants? Yes

How are teaching assistants trained? What guidance or assistance are they provided?
For new lab TAs, they attend a TA training session given by the gen chem coordinator to go over general safety and lab supervision items. They also meet 1-on-1 with the instructor for the course, usually weekly, to discuss upcoming experiment. For gen chem labs (and sometimes organic), they are required to do the experiment themselves ahead of time to get a feel for it and be better able to answer student questions. They can always ask the gen chem coordinator, or other faculty, questions when they have them, as well as get assistance from the stockroom manager on how to use equipment.
Grading TAs meet with the assigned instructor, to go over policies.

How are teaching assistants supervised in the laboratory?
For gen chem, we run "double-lab" sections, meaning the students in the gen chem course are split between 2 rooms, where the instructor is one room and across the hall, the GA is in the other. Thus the instructor is always available, and will periodically walk over to the other lab to see how things are going and as needed. Faculty can ask GAs to stop by office to discuss any issues.
For organic GAs, they are only there for ~50% of the labs, to assist when the students are going to be in 2 different locations (some taking NMRs in NMR room, rest working in lab), and when experiments more demanding (extraction experiment where need to help both with bench things and run 4 rotovaps).

On occasion, a GA has been assigned to the biochem lab (to prep solutions only) and to pchem lab (to help with experiment set-up / running through the experiment beforehand). The latter was mainly due to the Chair being the only person that was teaching the lab.
Additionally, all grad students take CHM 5003 Intro to Chemical Research, which in part covers various lab safety issues. Finally, at the end of the semester, students fill out GA evaluations for all with lab supervision roles, and faculty fill out GA evaluations for each GA. These are collected and reviewed by the graduate coordinator.

Infrastructure

Do the following meet the needs of the undergraduate program?		
Lab Instrumentation	Meets needs	
Research instrumentation	Meets needs	
Apparatus in teaching labs	Meets needs	
Apparatus available for research	Meets needs	
Facilities	Meets needs	
Space	Meets needs	

Any other infrastructure category you would like to report?
No

Technology and Hands-on using instruments

How do students gain hands-on experience using instruments?
We push hands-on experience to equipment hard and early on, with freshman labs using UV-VIS in multiple experiments. Sophomore organic labs introduce IR and high field NMR spectral acquisition on multiple occasions, along with GC, GC/MS, and polarimetry. Upper level labs have small enrollments, such that it is the students themselves that operate the instruments and collect their data (NMR, GC / GCMS / HPLC, AA, electrochemical and biochemical instruments), and our X-ray elective course has them collecting both single crystal and powder diffraction data for several experiments. Research students can test to be authorized users on the high-field NMR (meaning they don't require direct supervision), and regularly use the chromatography systems independently after sufficient instruction and experience.

Describe the computational chemistry facilities and software that students use in their coursework and research.

Our computational facilities have always been strong (with 1-2 servers employing Gaussian / GaussView), but one recent hire was a computational physical chemist, who now has 6 x ACTstation x250 Workstations with dual Intel Xeon CPU's with a total of 276 Cores and 672 Gb of RAM, that are used for several physical chemistry labs. Recently we have introduced computational chemistry into the freshman labs (WebMO), and organic II lab includes calculating heats of formation for nitration intermediates using Spartan. The advanced lab also uses Spartan to examine regioselectivity of a Diels-Alder reaction, and recently the biochemistry lab has employed various docking programs. We also maintain a license to Origin to assist with data management and interpretation. The computational chemist also has a license for CrystalMaker.

Journals and Databases

How many chemistry journals do your students have immediate institutional access to?
14 or more

Do your students and faculty have access to journals that are not available on campus through interlibrary loan?
Yes

To which of the following online databases do your students have access?
SciFinder

Instrumentation

Instrument	Year Acquired	Manufacturer	Model	Used for instruction	Used for Research
Liquid chromatograph	2,012	Hitachi	5310 with 5430 diode array, 5440 fluorescence detector, and Soft-A 300S ELSD	true	true
GC-Mass spectrometer	2,012	Shimadzu	QP2010SE	true	true
Other Chromatography and separations	2,012	GE Healthcare	AKTAPurifier 10	true	true
Electrochemical Instrumentation	2,021	CH Instruments	RRDE-3A rotating disk apparatus	true	true
Electrochemical Instrumentation	2,020	Metrohm	Autolab 302N Potentiostat	true	true
Electrochemical Instrumentation	2,012	Princeton Applied Research	263A Potentiostat/Galvanostat	true	true
NMR Spectrometers	2,012	Bruker	Avance III	true	true
Atomic absorption/emission	1,982	Perkin Elmer	2380	true	false
IR spectrometer	2,012	Nicolet	iS10	true	true
IR spectrometer	1,999	Thermo Nicolet	Avator 360	true	true
Other Optical Molecular Spectroscopy	2,016	Edinborough Instruments	FS5	true	true
UV-Vis spectrometer	2,012	Agilent	Cary 100	true	true
Thermal analysis equipment	2,006	TA	TGA Q50	true	true
Schlenklines and dry box apparatus	2,008	Labstar	Super 1200/780	false	true
Schlenklines and dry box apparatus	2,008	Labstar	Super 1200/780	false	true
Schlenklines and dry box apparatus	2,018	VTI	Super 1220/750/900	false	true
servers (5)		ACT	Station x250	true	false
X-ray diffractometer	2,008	Bruker	ApexII with CCD detector	true	true

Other Chromatography and separations	FPLC system
Other Optical Molecular Spectroscopy	Spectrofluorometer

Laboratory Environment & Safety Culture

Are the following adequate?		Are they inspected and tested?	
Safety showers	Yes	Yes	
Eye Washes	Yes	Yes	
Fire Extinguishers	Yes	Yes	
Hoods	Yes	Yes	
Ventilation System	Yes	Yes	

Are regular safety inspections of teaching and research laboratories conducted?
Yes

Does your department have a written chemical hygiene plan?
Yes

Are there adequate facilities and arrangements for disposal of chemical waste?
Yes

Are safety information and reference materials (e.g. MSDS, SDS, SOPs) readily available to all students and faculty?
Yes

Is appropriate personal protective equipment available and used by all students and faculty?
Yes

Safety Culture

Does the chemistry department have a safety committee? Yes
If yes, how often does it meet? 3-5 times a year
Does the chemistry department have a safety officer? Yes

Curriculum

Link to course catalog or department website:
https://www.eiu.edu/eiuchem/Advisement_Chemistry_Checksheets_Study_Plans.php (and links therein);
https://www.eiu.edu/eiuchem/courses.php for course descriptions

Tracks:
Chemistry, Chemistry concentration BS
Biochemistry BS

Courses

Introductory Courses

Course Number	Course Title	Credit hours	Online?	Lab?	Textbook	Authors	Total hours in lecture	Total hours in lab
BIO 1500	General Biology I	3	false	false	Campbell Biology 11th ed	Urry, Cain, Wasserman, Minorsky, Reece	45	0
BIO 1500L	General Biology I Lab	1	false	true	Campbell Biology, 11th ed	Urry, Cain, Wasserman, Minorsky, Reece	0	45
CHM 1310	General Chemistry I	3	false	false	Chemistry: The Central Science, 13th ed	Brown, LeMay, Bursten, Murphy, Woodward, Stolzfus	45	0
CHM 1395	General Chemistry I Lab, Honors	1	false	true	(in house manual)	(He)	45	45
CHM 1315	General Chemistry I lab	1	false	true	(in house lab manual)	(S Pellizzeri)	0	45
CHM 1390	General Chemistry	3	false	false	Chemistry: The	Brown, LeMay,	45	0

	I, Honors				Central Science, 13th ed	Bursten, Murphy, Woodward, Stolzfus		
CHM 1410	General Chemistry II	3	true	false	Chemistry: The Central Science, 13th ed	Brown, LeMay, Bursten, Murphy, Woodward, Stolzfus	45	0
CHM 1415	General Chemistry II Lab	1	false	true	(in house manual)	(Pellizzeri)	45	45

Foundation Course

Course Number	Course Title	Type (ABIOP)	Credit hours	Online?	Lab?	Textbook	Authors	Total hours in lecture	Total hours in lab
CHM 3450	Biochemistry I	Biochemistry	3	false	false	Biochemistry, 5th ed	Garrett, Grisham	45	0
BIO 3300L	General Microbiology	Biochemistry	2	false	true	Microbiology with Diseases, 5th ed; Microbiology: Laboratory Theory and Application; Microbiology, 2nd ed	Baumann; Leboffe, Pierce; Wessner, Dupont, Charles, Neufeld	0	60
BIO 3200	Genetics	Biochemistry	3	true	false	Concepts of Genetics, 11th ed	Klug, Cummings, Spencer, Palladino	45	0
BIO 3200L	Genetics Lab	Biochemistry	1	false	true	Concepts of Genetics, 11th ed	Klug, Cummings, Spencer, Palladino	60	60
CHM 2310	Inorganic Chemistry I	Inorganic	3	false	false	Inorganic Chemistry	Miessler, Fischer, Tarr	45	0
BIO 3300	Microbiology	Biochemistry	2	false	false	Microbiology with Diseases, 5th ed; Microbiology: Laboratory Theory and Application;	Baumann; Leboffe, Pierce; Wessner, Dupont, Charles, Neufeld	30	0

						Microbiology, 2nd ed			
CHM 2440	Organic Chemistry I	Organic	3	false	false	Organic Chemistry, 9th ed	Wade, Simek	45	0
CHM 2445	Organic Chemistry I Lab	Organic	1	false	true	Organic Chemistry Survival Manual, 11th ed	Zubrick	0	45
CHM 3915	Physical Chemistry Lab	Physical	2	false	true	Physical Chemistry, 9th ed; Experiments in Physical Chemistry 7th ed	Garland, Nibler, Shoemaker	15	45
CHM 2730L	Quantitative Analysis	Analytical	1	false	true	Quantitative Analysis, 9th ed	Harris	60	60
CHM2730	Quantitative Analysis	Analytical	2	false	false	Quantitative Analysis, 9th ed	Harris	30	0
CHM 3910	Thermodynamics and Kinetics	Physical	3	false	false	Physical Chemistry, 9th ed; Applied Math for Physical Chemistry 3rd ed	Atkins, de Puala; Barrante	45	0

In-Depth Courses

Course Number	Course Title	Pre-requisite	Credit hours	Online?	Lab?	Textbook	Authors	Total hours in lecture	Total hours in lab
CHM 4860	Advanced Biochemistry	3450	3	false	false	Biochemistry, 5th ed	Garrett, Grisham	45	0
CHM 4915	Advanced Lab	2840, 4900	3	false	true	Introduction to Spectroscopy, 5th ed; Inorganic Chemistry, Principles of Structure and Reactivity, 4th ed; Synthesis and Techniques in Inorganic Chemistry, 3rd ed	Pavia, Lampman, Kris; Huheey, Keiter, Keiter; Girolami, Rauchfuss, Angelici	15	60
CHM 3460	Biochemistry II	3450	3	false	false	Biochemistry, 5th ed	Garrett, Grisham	45	0
CHM 3455	Biochemistry Lab	3450	2	false	true	Biochemistry Laboratory, 2nd ed	Boyer	15	45
CHM 4750	Environmental Chemistry	2730	3	false	false	Environmental Chemistry, 5th ed	Baird, Cann	45	0
CHM 4900	Inorganic Chemistry II	2310	3	false	false	Inorganic Chemistry, Principles of Structure and Reactivity,	Huheey, Keiter, Keiter; Housecraft, Sharpe	45	0

						4th ed; Inorganic Chemistry, 3rd ed			
CHM 3780	Instrumental Analysis	2730	2	false	true	Quantitative Chemical Analysis, 9th ed; Fundamentals of Analytical Chemistry 9th ed	Harris; Skoog, West, Holler	30	0
CHM 3780L	Instrumental Chemistry Lab	2730	1	false	true	Quantitative Chemical Analysis, 9th ed; Fundamentals of Analytical Chemistry 9th ed	Harris; Skoog, West, Holler	45	45
CHM 4790	Medicinal Chemistry	2440, 2840	3	false	false	Foye's Principles of Medicinal Chemistry, 7th ed; Wilson & Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, 12th ed	Williams; Beale, Jr, Block	45	0
CHM 2840	Organic Chemistry II	2440, 2445	3	false	false	Organic Chemistry, 9th ed	Wade, Simkek	45	0
CHM 2845	Organic Chemistry II lab	2440, 2445	1	false	false	Organic Chemistry Survival Manual, 11th ed;	Zubrick; Pavia, Lampman, Kris	0	45

						Introduction to Spectroscopy, 5th ed			
CHM 3920	Quantum Chemistry	2730	3	false	false	Molecular Quantum Mechanics, 5th ed; Physical Chemistry, 9th ed; Quantum Chemistry, 2nd ed	Atkins, Friedman; Atkins; McQuarrie	45	0
CHM 4800L	Special Topics (X-ray Crystallography)	1410	1	false	true	Principles of X-ray Crystallography; Crystal Structure Determination	Ooi; Massa, Werner	0	45
CHM 4800	Special Topics (X-ray Crystallography)	1410	2	false	false	Principles of X-ray Crystallography; Crystal Structure Determination	Ooi; Massa, Warner	30	0

Other Courses

Course Number	Course Title	Category
MAT 1441	Calculus I	Mathematics Course
MAT 2442	Calculus II	Mathematics Course
PHY 1351	General Physics I	Physics Course
PHY 1352	General Physics I Lab	Physics Course
PHY 1361	General Physics II	Physics Course
PHY 1362	General Physics II Lab	Physics Course
CHM 3500	Introduction to Chemical Research	Other Contact Hours Course
CHM 3000	Undergraduate Seminar	Other Contact Hours Course
CHM 4000	Undergraduate Seminar	Other Contact Hours Course
CHM 3001	Undergraduate Seminar	Other Contact Hours Course
CHM 4001	Undergraduate Seminar	Other Contact Hours Course

Macromolecular, Supramolecular, and Nanoscale Coverage (MSN)

How is the requirement for coverage of at least two of the following areas - synthetic polymers, biological macromolecules, supramolecular aggregates and, or, meso or nanoscale systems(see Section 5.1 in the ACS Guidelines) satisfied within course work required for certification?

Distributed coverage among course required for certification

Synthetic Polymers	Supramolecular Aggregates	Nano or Mesoscale Materials
Covered? Yes **Lecture hours:** 20 **Lecture course number(s):** 2440, 2840, 4900, 3780 **Lab hours:** 6 **Lab course number(s):** 3915 **Characterization:** In Inorganic II (CHM 4900), the characterization of MOFs by X-ray crystallography and their gas uptake/storage by adsorption/desorption studies is discussed. In physical chemistry lab (CHM 3915), the heat of combustion of polymers, as well as the structure and relationship to this, are explored in an experiment. **Physical Properties:** In Organic I (CHM 2440), IR spectroscopy of polymers, and fact that it is the bulk property of the monomer and not the ends that dominate their behavior, is discussed. In Organic II (CHM 2840), the relative strengths of different bonds are related to the different properties of the condensation polymers (flexible vs stiff). In Instrumental (CHM 3780), TGA, DSC, AFM, and STM are discussed. **Preparation/synthesis:** In Organic I, polymerization of alkenes and alkynes are covered, and 3 methods for polymerization (anionic, cationic, and free-radical discussed). In Organic II, condensation polymers are discussed	**Covered?** Yes **Lecture hours:** 40 **Lecture course number (s):** 3450, 3460, 4860, 3780 **Lab hours:** 56 **Lab course number(s):** 3455, 4915 **Characterization:** In biochemistry lab, SDS-PAGE gel electrophoresis and Bradford assays are performed. In advanced lab, 1H NMR titration studies as well as UV-VIS are used to characterize the rotoxane. In instrumental (CHM 3780), techniques such as x-ray synchrotrons, TEM/SEM, MALDI-TOF, TGA/DSC, and STM/AFM are discussed, with application to supramolecular compounds. **Physical Properties:** In multiple biochemistry lecture courses (CHM 3450, 3460, 4860), programs such as PolyMol, Chimera, and PDB are used to explore protein structure. In biochemistry lab (CHM 3455), Michaelis-Menton kinetics are run as well as docking studies. In advanced lab (CHM 4915), 1H NMR titration studies as well as UV-VIS are used to characterize the rotoxane. **Preparation/synthesis:** In the biochem sequence (CHM 3450, 3460, 4860), the biosynthesis of supramolecular frameworks such as DNA, RNA, and oligiosaccharides are discussed in great details, as well as	**Covered?** No

with the reaction of carboxylic acid derivatives. In Inorganic II, the synthesis of MOFs are discussed.	protein-protein interactions. In biochemistry lab (CHM 3455), enzymes are expressed via plasmids and purified via FPLC. In advanced lab (CHM 4915), the ligands and a pseudorotaxane are prepared.	

Biological Macromolecular Coverage

Courses where the content includes coverage of biological macromolecules:

Course	Title	Category
CHM 3450	Biochemistry I	Foundation Course
CHM 3460	Biochemistry II	In-Depth Course and Research
CHM 3455	Biochemistry Lab	In-Depth Course and Research

Undergraduate Research Details

Number of chemistry majors involved	Number of chemistry faculty members involved	Number of faculty members involved (not in chemistry department)
68	10	2

Describe the mechanisms for financial support for students and faculty participating in undergraduate research.

Undergrads can apply for a SURE (scholars in undergraduate research) award from the College of Liberal Arts & Sciences, for $300 to student and $100 to faculty. They can also apply for FA, SP, or SU URSCA (undergraduate research, scholarship, and creativity awards) for $500 to student and $250 to faculty. Students have also applied to Illinois State Academy of Sciences for research grants, and to ACS and ASBMB for travel grants to present research. Finally, each summer the Dept grants a Keiter Summer Research Fellowship to 1 deserving major, for $4000 to the student for 10 weeks in the summer.

Faculty with external grants hire undergraduates during summer for 10weeks.

Faculty get 0.4CUs per undergraduate research, and can apply for both FA CFR (council on faculty research) grants for ~$4000 and FA student impact for faculty mentors for ~$1500 - these are used to purchase commodities, support travel, and contractual services. There are summer CFR grants that cover faculty salary only. The Dept does make judicious use of our Gift (donor) account to help support travel costs.

Undergraduate Research and Safety

How are research students provided with laboratory-specific safety education and training?

one-on-one training with a faculty advisor:	true
one-on-one training with graduate student or postdoctoral researcher:	false
online training:	false
a face-to-face safety course:	true
read and sign a document with common SOPs for the research:	false
read the appropriate chemical hygiene plan:	true

Research to Meet Requirements

Do you use undergraduate research to fulfill lab or in-depth course certification requirements? Yes	**Do you use undergraduate research to meet certification requirements for lab hours?** Yes
Do you use undergraduate research to meet certification requirements for in- depth coursework? No	**Do you require a comprehensive written research report?**
Do you have a standard rubric for assessment of the research report?	

Publications and Presentations

Have the results of recent undergraduate research projects been published?

Yes

Describe the opportunities that students have to present their research.

Internally, in the fall the Dept hosts a Research Celebration with invites to all majors, students in chemistry courses who demonstrate aptitude/interest in chemistry, emeriti and donors, closely-related chairs and Deans, and upper admin - usually 1-3 posters per research group are presented by grad and undergrad students In the spring there is a University-Wide Student Research Conference for grad and undergrad (SURE and GSI award winners required to present). Locally, students often present at the East Central Illinois Undergrad Research Conf (in Nov) and the Illinois State Academy of Sciences Annual Meeting (in Apr). Students also present at regional meetings (Central ACS and/or Great Lakes Regional), national (ACS, ASBMB), and international (International Symposium on Spectroscopy). Travel expenses for students working on grant-funded projects are covered by the external grant; Dept tries to assist rest of travel and are on-campus opportunities to help as well (SURE, GSI, Williams Travel Award). Dept usually covers cost of printing posters.

Off Campus Work

Do undergrads in your program participate in research outside of your institution?
Yes

Student Skills & Competencies

Problem Solving Skills

Course/Lab where skill is first introduced
Problem solving skills are present in all chem courses, and introduced in the general chemistry lecture (CHM 1310 / 1390 / 1410) and laboratory (CHM 1315 / 1395 / 1415) sequences.

Courses where development of this skill is emphasized.
This skill is emphasized in virtually all chemistry courses beyond general chemistry, with problem solving techniques / approaches discussed as different types of problems / questions are presented.

Provide up to 3 examples of assignments and assessments
In CHM 1415 (gen chem II lab), Experiment 3 is on solutions and solution concentrations, and requires students to prepare a saturated solution of K2SO4, experimentally determine and report the density, mass percent, mole fraction, and molarity of their solution as well as experimentally determine the density and mass percent of a stock solution. The lab manual does not provide explicit directions on how to do any of these steps, and the pre-lab asks the students to design the experiment protocols needed.
In CHM 2845, a series of homework assignments are given where students are required to both (1) match and (2) solve structures from either IR, 1H NMR, 13C NMR, or MS spectra of a series of compounds.
In both CHM 3910 and 3920 (physical chem lecture courses), students are given problems to work out on the board during lectures, and the approach analyzed and feedback given by the instructor.
The end experiment in Instrumental (CHM 378) asks for students to come up and implement an instrumental method to determine the amount of a component present in a "real-life" sample, including sample prep and reduction of matrix effects.

Reading and, or, searching the primary literature

Course/Lab where skill is first introduced
CHM2845 Organic Chemistry II lab, where the students are required to use SciFinder Scholar to find literature melting points of Aldol products made.

Courses where development of this skill is emphasized.
CHM 3500 Introduction to Chemical Research and the seminar series (CHM 3001/4001) both heavily emphasize this area. The latter requires the students to find a recent research paper and present it in a 20- or 30-minute PowerPoint, and of course this requires them to look at citations / citings of their main chosen paper. In addition, most upper level courses include an emphasis. Most upper level courses (biochem sequence and labs CHM 3450, 3460, 4860 and 3455; inorganic II and advanced lab CHM 4900 and 4915, instrumental CHM 3780; physical chemistry lab CHM 3915; and electives (med chem CHM 4790, environmental chem CHM 4750) have one or more components where students are required to read primary literature and/or search for related articles or previous means of analysis / specific data.

Provide up to 3 examples of assignments and assessments
In CHM 3500, a literature search project requires the students to use SciFinder Scholar to find papers on very specific topics, by specific authors, papers citing other papers, as well as searching for specific chemicals and finding papers detailing their synthesis as well as properties.
In CHM 3450, a current and specialized topic is presented in the lecture and then students are required to find and provide a "mini-review" on 3 related papers from recent literature on said topic, which is graded.
In CHM 4900 Inorganic II, the last two weeks revolve around special topics, which start with a comprehensive review on a newer subject, and then require the students to find and briefly present a recent application on said topic.

Communication: Writing

Course/Lab where skill is first introduced

Chemistry majors in the Honors Gen Chem I course complete at least one written report, while those who do not first encounter written laboratory reports in Organic I lab. In Organic lab, this is done stepwise, where for 1st experiment they write just the purpose (or abstract) and conclusion (along with a worksheet), for Exp 2 they write the discussion, and for Exp 3 they write the experimental. After that, with the exception of 2 experiments, the rest of the reports are all full written reports.

Courses where development of this skill is emphasized.
Emphasis continues in Organic II lab, where nearly all the experiments require written reports (last experiment is usually just a worksheet). All upper level labs (biochemistry, instrumental, physical chemistry, and advanced lab) require full written reports. For instrumental and physical chem labs, there is usually the opportunity for one rewrite of a report. For undergrad research, full written reports are required, with most faculty adopting manuscript-type reports. Some elective courses require students to write a short summary paper on a method / special topic.

Provide up to 3 examples of assignments and assessments
For Organic I lab, students carry out the addition of HCl (generated in situ) to carvone - the report for this experiment requires a purpose, the reaction drawn using software, a table of reagents, a full experimental section, discussion, and conclusion sections. The discussion requires them to comment on the yield and purity of the compound, as well as giving the logic that allows them to determine which of the 4 regioisomers was obtained based on both IR and 1H NMR data.
For physical chemistry lab, students are required to write full reports (with abstract, introduction, experimental, results and discussion, and conclusion sections) that often run 8-15 pages and include discussion of the theory behind the experiment as well as the success of the experiment.
For CHM 3001/4001 (seminar), the students are required to write a 1-page "abstract" that both covers the background and summarizes the research paper that they are presenting.

Communication: Oral

Course/Lab where skill is first introduced
Our Dept requires a 4-semester seminar series, where the 1st and 3rd semester the students just attend seminars by their peers and external speakers and provide guided critique on the student seminars, but in the 2nd and 4th seminar give a literature based seminar of 20 and 30 minutes, respectively, with the aid of a faculty coach. The instructor for seminar usually gives 1-2 lectures on preparing and delivering a seminar, as well as posting a great deal of powerpoints with tips on the D2L page.

Courses where development of this skill is emphasized.
See above, with the 2nd seminar providing additional development of skills. Additionally, several of the upper level courses (biochemistry II and III, instrumental, medicinal, and environmental chemistry) require students to prepare short (10-15 minute) PowerPoint presentations on topics not explicitly covered in the course.

Provide up to 3 examples of assignments and assessments
For the junior seminar, a student will find a recent (within past 3 years) journal article from a high-impact peer-reviewed journal, and with the help of their faculty coach, dissect and fully understand the paper. They will then write an abstract for their talk, as well as use PowerPoint to assemble a 20minute talk to present the work and then answer questions. Students are assessed for content, delivery, presentation, visual aspects and knowledge by both their peers and the faculty attending the seminar (only the latter is used in grade determination). Their grade also takes into account time penalties (for going short/long, with too short a seminar requiring the student to repeat) and a grade from their faculty coach.
For medicinal chemistry, near the end of the course the students will select a specific small molecule pharmaceutical, and, using PowerPoint, give a 10minute presentation that covers the target/mode of action, discovery & SAR, synthesis, and sales/impact. A brief question and answer section follows, and the presentation is assessed for coverage and detail, presentation style and delivery, quality of slides/organization, and knowledge by both the students and the instructor.
For instrumental chemistry, each student will present a short overview of a specific instrumental method to introduce the topic to the class.

Ethics

Course/Lab where skill is first introduced
While ethics is mentioned in 1st and 2nd year majors courses (general chemistry, organic chemistry), in particular the labs with regards to reporting actual data, it is really first introduced in depth in CHM 3500 Introduction to Research. There are also snippets of historical unethical behavior mentioned in these lectures courses, as appropriate.

Courses where development of this skill is emphasized.
Ethics is emphasized in the required Introduction to Research course, where a significant unit on ethics is part of the course.
Additionally, it is often touched upon in discussion in some of the upper level lecture courses, such as the Biochemistry courses, Medicinal Chemistry, and Inorganic II.

Provide up to 3 examples of assignments and assessments
In CHM 3500, two sets of readings from "On Being a Scientist" are assigned, with questions to be turned in.
In CHM 3500, a few (2-5) case studies of unethical behaviors are given for students to read and discussed in 1 or more class settings. Questions related to these are included on the final exam.
In CHM3500, students are required to complete either the CITI or the NSF Responsible Conduct of Research Training, and forward their certificate of completion to the instructor.

Safety

Course/Lab where skill is first introduced
Safety is introduced in general chemistry labs, as before the first lab students must read and sign the student safety code (which requires reading the safety sections of the manual). The manuals also stress safety issues specific to each experiment at the beginning of the procedure, as well as addressing disposal of materials at the end. Additionally the instructors highlight the safety issues in their pre-lab lectures.

Courses where development of this skill is emphasized.
This skill is emphasized in all courses following, with the organic labs again including safety information specific to each experiment at the start of the procedure, and often including a question on the pre-lab quiz regarding safety. Upper level labs continue to stress safety, as well as requiring at times for the students to find the chemical hazards themselves.
A required course for all majors is Introduction to Chemical Research, where ~50-65% of the content covered revolves around safety. Students are required to read the Dept's Chemical Hygiene Plan, and are exposed to general safety practices and protective equipment, as well as SDS.
Safety is also emphasized by faculty research advisors.

Provide up to 3 examples of assignments and assessments
In CHM 3500, a 32-page reading from "Safety in Academic Chemistry Laboratories" is given, with questions to be turned in for grading.
In CHM 3500, either a video of fire extenguisher safety, or a live fire extenguisher exercise by the Charleston Fire Dept, is assigned with a set of questions graded afterwards.
In CHM 3500, readings from "Prudent Practices in the Laboratory" are assigned, as is a chemical accident analysis assignment, which are accompanied by a set of questions / class discussion on which the students are graded.

Team Skills

Course/Lab where skill is first introduced
For some of the general chemistry labs, experiments are done in pairs and/or the class data is pooled for analysis (such as in the analysis of copper, to use the student t-test to determine confidence interval of the measurement).

Courses where development of this skill is emphasized
Some of the organic labs are done as pairs, and the smaller lab size / lab atmosphere promotes informal collaborations between students. Due to instrument/apparatus limitations, most experiments in the biochemistry,

instrumental, and physical chemistry lab are done in teams of 3-4 students. For the advanced lab, the small class size promotes informal collaboration as well as having several experiments where the class data is pooled (eg, each student uses a different starting material, or different conditions (thermodynamic vs kinetic, etc).
As most research groups are comprised of 3-5 undergraduates and 1-3 MS students, team skills develop here as well, as students work together on different parts of a project and/or attend group meetings.

Provide up to 3 examples of assignments and assessments
In both CHM 3910 and 3920 (physical chem lecture courses), students in pairs or groups are given problems to work out on the board during lectures, and the approach analyzed and feedback given by the instructor.
In CHM 3915, all experiments are done in teams of 2-4, and students carry out different parts of the investigation. For instance, they construct a binary phase diagram, where one student often obtains the refractive indexes of the vapor and solution fractions, while a second student records the temperature readings, and a third student adjusts the system pressure. They pool their results for the formal laboratory reports to be submitted individually.
Likewise in CHM 3780, students work in pairs or groups of 3 to utilize each instrument, having to come up with the proper calculations to prepare solutions of appropriate concentration, carry out working on the instrument, and analyzing the data. They turn in individual formal laboratory reports.

Program Self-Evaluation

What is the department's mission?
The Department's mission is to provide undergraduates with an excellent education in the main fields of chemistry, encompassing both theoretical aspects and practical applications, and to prepare them for the next step in their career, be it entering industry, chemistry graduate school, a professional health profession school, or teaching at the high-school level. The curriculum pushes direct use of instrumentation by the students as well as application of common software and literature searching databases, as well as emphasizing safety, personal responsibilities and ethical behavior. As communication skills are essential, a seminar series is required and formal lab reports are required throughout many of the lab courses. The department fosters high-quality student-faculty interactions, with faculty who are actively supervising research projects where undergraduates not only make significant contributions but are also urged to present their work at local, regional, and national meetings and/or are included as authors on peer-reviewed publications. The department also fosters team-working and collaborative/interdisciplinary studies as well as providing an inclusive and supportive atmosphere for student success.

How does it align with the institution's mission?
The Department's mission is exactly in line with the University's mission (https://www.eiu.edu/about/mission.php).

What are the current strategic goals?
Current strategic goals are to actively hire additional Unit A faculty members to replace those lost due to retirement / budget impasse, so that have at least two who can teach in each of the five main fields, and at the same time to increase the diversity of the faculty, particularly in terms of gender and underrepresented minorities. Along with this, to increase the number of undergraduates to a more sustainable level and have the numbers be balanced across the programs (in particular there are a low number of BA and BS/MS students). Related to this, our graduate program has been struggling recently to draw in sufficient number of quality students, so increasing recruiting efforts / removing barriers for application as well as development of non-thesis based programs are a focus. With the planning for a new Science Building underway, identification of unneeded resources and acquisition of new / replacement resources are targeted. Another goal is to examine and identify ways to increase student success in the general chemistry sequence.

How often and in what way are these goals assessed?
These goals are assessed on a 3-5 year basis and/or with a change in the chair. Assessment begins with comparison of numbers from goal inception to current, and also draws on the Dept assessment reports submitted to the College / University. The results are discussed at faculty meetings and adjustments made based on consensus recommendation.

How is the program evaluated and what is the procedure? (External, internal, etc.)
Internally, assessment reports are required by the University for all departments on a 2yr and a more comprehensive 4yr basis. The program is also reviewed as part of the entire university IBHE-review. Periodically an external review by CUR is requested.

What are the current metrics to define advancement in education and training of students, improving infrastructure, advancing the DEI (Diversity, Equity, and Inclusion) climate, and improving the work environment for all faculty and staff?
Current metrics for education and training of students include feedback from 3- and 8-year alumni surveys along with employer surveys as well as tracking their career development after EIU, a written and in-person exit survey, scores from the Major Field Test. Metrics for improving infrastructure Metrics for advancing DEI include tracking number of faculty, staff, and students, as well as specific questions on exit interviews. Metrics regarding the work environment include

Comments

Please comment on changes in the last six years in diversity initiatives, professional development, support personnel, facilities, capital equipment, curriculum, and any other items related to your program that you believe would be of interest to CPT. We are especially interested in any new programs you are about to undertake. Please do not include actual self-evaluation documents or reports.

Over the past 6 years the number of faculty in the department has decreased significantly, which is presenting difficulties both in terms of scheduling as well as committee assignments. The University has provided us with 3 searches prior to this year, and 1 replacement one for this year, as it has emerged from the budget crisis. The College and University do remain supportive of our efforts for the most part, though travel funds are very slow in being reinstituted. A full-time office manager is needed. We are beginning to see some aging equipment that will need replacement, in part due to the operating system employed. The BA program has not significantly reduced the number of BS majors, and has worked to accommodate students who run into successful completion of upper-level courses. A new worry is that the Biological Sciences Dept has reduced their math requirement to simply Business Calculus, making it harder for us to attract students on the border between chemistry and biology majors, as well as reduced course offerings by the Physics Department that sometimes has our majors taking the non-calculus based physics. Our available journals continue to be a subject of worry, as rising costs that exceed library budget has resulted in most all subscriptions except for the ACS package being cancelled (ChemComm and Chemistry Society Reviews being important exceptions), and some Wiley journals via another package. Undertaking new programs is problematic at this point with current staffing. We have implemented a D2L page solely for majors / grad students to keep them informed of Dept events as well as build collegiality, as well as regularly updating our main bulletin board near the office.

Which of the following were affected by the COVID-19 pandemic (check all that apply)?

Foundation course offerings
In-depth course offerings
Ensuring that certified students receive 400 hours of lab instruction

If Other, please describe.

Please provide a brief narrative describing how you plan to address these issues over the next 5-6 years.

By increasing faculty, and current tenure-track faculty obtaining tenure, both the delivery of courses / expansion of curriculum and recruitment of majors can be solved, as well as increased efforts by 1000- and 2000-level instructors. Some instrument gains will rely on NSF-MRI funding, while an instrument drive to the donors is another plan (coupled with the construction of the New Science Building). The New Science Building's physical location will make it untenantable for the current office manager to be shared. A review of the curriculum, with special focus on MSN exposure, the possibility of offering more electives on a more consistent basis, and the new CPT guidelines, will be undertaken

Contact Hours

Institutions are required to submit contact hours only if the average number of contact hours for all faculty is less than 12 AND no one individual faculty member has 12 or more hours in a single semester.

If institutions do have to submit a contact hour table, then they will submit only for faculty members with 12 or more contact hours in a single semester.

Type of academic calendar: Semester

Semester	Name	Role	Course	Class Time (min)	Freq per week	Contact hours
Fall Semester or First Quarter	Yuhua Lu	Instructional Faculty	General Chemistry I	50	3	3
Fall Semester or First Quarter	Tiffany Pellizzeri	Instructional Faculty	General Chemistry II	50	3	3
Fall Semester or First Quarter	Yuhua Lu	Instructional Faculty	Organic Chemistry I Lab	170	1	3
Fall Semester or First Quarter	Yuhua Lu	Instructional Faculty	Organic Chemistry I Lab	170	1	3
Fall Semester or First Quarter	David Naistat	Instructional Faculty	General Chemistry I lab	170	1	3
Fall Semester or First Quarter	Tiffany Pellizzeri	Instructional Faculty	General Chemistry I lab	170	1	3
Fall Semester or First Quarter	Tiffany Pellizzeri	Instructional Faculty	General Chemistry II Lab	170	1	3

Semester	Name	Role	Course	Class Time (min)	Freq per week	Contact hours
Spring Semester or Second Quarter	Yuhua Lu	Instructional Faculty	General Chemistry I	50	3	3
Spring Semester or Second Quarter	Yuhua Lu	Instructional Faculty	General Chemistry I	50	3	3
Spring Semester or Second Quarter	David Naistat	Instructional Faculty	General Chemistry I	50	3	3
Spring Semester or Second Quarter	David Naistat	Instructional Faculty	General Chemistry I lab	50	3	3
Spring Semester or Second Quarter	Yuhua Lu	Instructional Faculty	General Chemistry II Lab	170	1	3
Spring Semester or Second Quarter	Yuhua Lu	Instructional Faculty	Organic Chemistry I Lab	170	1	3
Spring Semester or Second Quarter	David Naistat	Instructional Faculty	Organic Chemistry I Lab	170	1	3
Spring Semester or Second Quarter	Tiffany Pellizzeri	Instructional Faculty	General Chemistry I lab	170	1	3
Spring Semester or Second Quarter	Tiffany Pellizzeri	Instructional Faculty	General Chemistry II Lab	170	1	3