***STUDENT LEARNING ASSESSMENT PROGRAM***

***SUMMARY FORM AY 2017-2018***

Please complete a separate worksheet for each academic program (major, minor) at each level (undergraduate, graduate) in your department. Worksheets are due to CASA this year by **June 15, 2018**. Worksheets should be sent electronically to [kjsanders@eiu.edu](mailto:kjsanders@eiu.edu) and should also be submitted to your college dean. For information about assessment or help with your assessment plans, visit the Assessment webpage at <http://www.eiu.edu/~assess/> or contact Karla Sanders in CASA at 581-6056.

Chemistry BA and BS, Biochemistry BS

**Degree and**

**Program Name:**

# Submitted By:

Rebecca Peebles, Chair

**Please use size 10 font or larger.**

**PART ONE**

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| What are the learning objectives? | How, where, and when are they assessed? | What are the expectations? | What are the results? | Committee/ person responsible? How are results shared? |
| 1. Students will learn  fundamental principles and  applications in each of the  major sub-disciplines in  chemistry. | a) ETS Major Field Test  administered to graduating  seniors; b) item on exit survey  for graduating seniors; c) item  on alumni survey sent each year  to 3-year and 8-year alumni | a) For each subtest, most  examinees scoring at or > 50th  percentile; b),c) average  response ≥ 3 on 5-point scale  where 5=strongly agree,  1=strongly disagree | a) % meeting expectation (of 4 students): Physical 50%, Organic 50%, Inorganic 50%, Analytical 50%; overall 50% at or above 50th percentile); b) Average = 4.3; c) 5.0 | Assessment Committee  administers exam and  surveys. Results  examined by department  chair and compiled by assessment  committee for sharing with department faculty and other committees (such as curriculum). |
| 2. Students will be able to  critically analyze a breadth of  chemical problems &  experimental results. | a) Critical thinking component  of Major Field Test; b) grades in  CHM 2730; c) CHM 3460,  presentation; d) item on exit  survey for graduating seniors; e)  item on alumni survey sent each  year to 3-year and 8-year alumni | Mean % correct for each year ≥ national mean; b) 75%  of majors receive grade of A or  B in CHM 2730; c) 100% of  students with summary score  of 40/50 on evaluation rubric;  d), e) average response ≥ 3 on  5-point scale where 5=strongly  agree, 1=strongly disagree | a) Mean % correct = not enough data for ETS to assess; b) 75% of majors received A or B; c) 100%; d) Average = 4.3; e) 4.5 | Assessment Committee  administers exam and  surveys. Results  examined by department  chair and compiled by assessment  committee for sharing with department faculty and other committees (such as curriculum) |

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| 3.Students will be able to  execute chemical experiments  utilizing modern methods &  equipment | a) Assignments in CHM 2845  (IR spectrometer), 3455 (UV/-  VIS spectrophotometer), 3780  (chromatography), 3915 (NMR  spectrometer), 4915 (inert  atmosphere techniques); b)  student research participation; c)  item on exit survey for  graduating seniors; d) item on  alumni survey sent each year to  3-year and 8-year alumni | a) 100% of students  successfully use specific  equipment to acquire data and  interpret the same with respect  to its chemical significance  (*e.g.* structure determination)  or perform a specialized  method in chemical synthesis  essential to obtaining a desired  product; b) 50% or more of  graduating seniors complete a  research project; c), d) average  response ≥ 3 on a 5-point scale  where 5=strongly agree,  1=strongly disagree | a) 2845: 100%, 3455: not taught in FY18, 3780: 100%, 3915: 100%, 4915: 100%; b) 66%; c) Average = 4.3; d) 4.0 | Department chair collects  course information and  Assessment Committee  administers surveys.  Information is shared  with assessment  committee and then  communicated to  appropriate (e.g.  curriculum) departmental  committees. |
| 4. Students will be familiar  with computer applications in  chemistry. | a) Assignments in CHM 2845,  (NMR data handling), 3915  (modeling exp.); b) item on exit  survey for graduating seniors; c)  item on alumni survey sent each  year to 3-year and 8-year alumni | a) 100% of students  successfully complete  specified assignment; b), c)  average response ≥ 3 on 5-  point scale where 5=strongly  agree, 1=strongly disagree | a) 2845: 100%, 3915: 100%; b) Average = 4.0; c) 3.5 | Department chair collects  course information and  assessment committee  administers surveys.  Information is shared  with assessment  committee and then  communicated to  appropriate (e.g.  curriculum) departmental  committees. |
| 5. Students will be able to  properly utilize chemical  information sources | a) Assignment in CHM 3500  (use of electronic databases to  find relevant chemical  information); b) CHM 3001 &  4001: seminar evaluation; c)  item on exit survey for  graduating seniors; d) item on  alumni survey sent each year to  3-year and 8-year alumni | a) 100% of students  successfully complete  assignment; b) CHM 3001:  100% of students with scores ≥  2 on literature item; CHM  4001: same as for CHM 3001;  c), d) average response ≥ 3 on  5-point scale where 5=strongly  agree, 1=strongly disagree | a) 100%; b) 100% of students in CHM3001 and 4001 (combined); c) Average = 4.5; d) 3.0 | Department chair collects  course information and  assessment committee  administers surveys.  Information is shared  with assessment  committee and then  communicated to  appropriate (e.g.  curriculum) departmental committees. |

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| 6. Students will be able to  apply the scientific method of  investigation. | a) Student research activity; b)  ACS review of sample research  reports submitted as part of 5-  year review of major. Reports  selected from those submitted by  majors enrolled in undergraduate  research; c) item on exit survey  for graduating seniors; d) item  on alumni survey sent each year  to 3-year and 8-year alumni | a) 50% or more of graduating  majors complete a research  project; b) positive review of  reports by ACS; c), d) average  response ≥ 3 on 5-point scale  where 5=strongly agree,  1=strongly disagree | a) 66%; b) ACS review report received FA16 and received positive feedback; c) Average = 4.8; d) 4.5 | Department chair collects  course information and  assessment committee  administers surveys.  Information is shared  with assessment  committee and then  communicated to  appropriate (e.g.  curriculum) departmental  committees. |
| 7. Students will be able to  communicate technical  material effectively in  speaking & writing | a) CHM 3001 & 4001: seminar  evaluation; b) presentation in  CHM 3460; c) writing  assignments in CHM 3780 (final  report) and 3915 (binary phase  experiment report); d) item on  exit survey for graduating  seniors; e) item on alumni  survey sent each year to 3-year  and 8-year alumni | a) CHM 3001: 90% of students  receive passing score on first  attempt; CHM 4001: same as  for CHM 3001; b) 100% of  students with summary score  of 40/50 on evaluation rubric;  c) 90% of students have scores  ≥ 70% on first attempt; d),e)  average response ≥ 3 on a 5-  point scale where 5=strongly  agree, 1=strongly disagree | a) 100% of students in CHM3001 and 4001 (combined); b) 100% c) 100%; d) Average (speaking) = 4.5, average (writing) = 4.3; e) Average (speaking) = 3.5, average (writing) = 3.0 | Department chair collects  course information and  assessment committee  administers surveys.  Information is shared  with assessment  committee and then  communicated to  appropriate (e.g.  curriculum) departmental  committees. |

(Continue objectives as needed. Cells will expand to accommodate your text.)

**PART TWO**

During FY18 we had hoped to start revising our assessment criteria for various learning goals and also to re-implement collection of data from alumni. Although alumni surveys were sent out in Spring 2017, response to these paper surveys has always been sparse. In Spring 2018, our Assessment Committee chair has moved these surveys online, so we hope to get a much improved response rate from alumni for inclusion in our FY19 report. Our current assessment criteria for the learning accomplishments of present students are based on percentages of students accomplishing certain goals in specific assignments in different courses. Last year, we expected to revisit some of these specific assignments during FY18 to update them to be sure they are consistent with our current curriculum. This proved impossible following the huge turnover and loss of tenure track faculty between FY17 and FY18. We cannot be sure of where we want our curriculum to be going and what we expect our students to get out of it until there is some stability in who is teaching the classes. In FY18, with many courses taught by 1 year ACFs, we were just able to maintain the status quo. In FY19 we will try again to revisit our learning goals and expected outcomes – there will be a few more experienced faculty actively participating in the department this year. Another concern with our current method of assessment is the reliance on percentages – with current low numbers of students in many classes, these percentages start to lose any statistical significance. We might look for a way to use data from 2-3 year “chunks” rather than one year individually, which could make it easier to identify legitimate trends. In the response to last year’s report, the lack of quantitative reasoning being explicitly mentioned in our objectives was brought up. This is covered and assessed extensively in our curriculum, with objectives 1-4 all assessing this in some way. As we revise our learning goals, we will also add at least one goal that explicitly addresses this essential part of our students’ learning.

**PART THREE**

In Spring 2017 we were able to send out alumni surveys after a gap the previous year. This has provided additional feedback on how our students perceive their learning on a longer term, which was missing last year. Unfortunately, the number of respondents was low (2), and in surveys being sent out now for next year’s report we are making an online form available to facilitate an increases in number of responses. Most of our course-based assessments also have significantly lower total numbers this year than last year, making comparisons of percentages less trustworthy; nevertheless, there were significant improvements in a number of categories compared to 2017. One of the most notable increases is in student performance on the Major Field Test, with all students meeting our expectations in all subdisciplines this year, while last year all but one subdiscipline was below expectations. This points towards a general increase in retention of chemistry knowledge by graduating seniors (since they do not study for this exam), and indicates good preparation for the job market or further studies. It seems like alumni and exit surveys corroborate this fact. Excellent performance on course-based measures of critical thinking also indicates that we may be improving in that area, and the CHM 2730 course used as part of this assessment is also a good measure of students’ quantitative reasoning skills (the course title is Quantitative Analysis). One of our strengths is in experimental training, and students’ high scores in this area help show this. Two challenges for us are to recover our faculty numbers so that more students will be able to take advantage of undergraduate research experiences, ideally pushing this percentage towards 100%, and to maintain and replace instrumentation used for teaching and research so that students will receive an up to date education and be well prepared for the instrumentation that they will encounter in future jobs or graduate school. Alumni surveys (only 2 responses) were very low on questions relating to computer skills, use of chemical information technology, and written and spoken communication skills. Based on these responses, we should remain aware of possible weaknesses in these areas and how we might improve.