

Assessment Report - Four Column

Eastern Oregon University

Program (CAS) Chemistry/Biochemistry

Catalog Description: Eastern Oregon University's Chemistry and Biochemistry Program prepares students for productive and satisfying careers in research, technology, health, environment, public service and teaching. By enthusiastically sharing its knowledge and love of learning, the Program also serves the general education needs of the University and the geographically broad community.

How Program serves the Mission: The Chemistry and Biochemistry Program provides two separate degree programs and supports the physical science liberal arts core. Graduates of these programs are highly sought after in the private and public sectors, and find employment as teachers, research chemists, or chemical technicians in industry, government labs and state or federal agencies. Most graduates continue to pursue advanced degrees in the physical and life sciences, the health professions, and in the Master of Arts in Teaching (MAT) program.

Program Outcomes	Means of Assessment & Benchmark / Tasks	Data Analysis	Closing the Loop & Follow-Up
Program (CAS) Chemistry/Biochemistry - Content Knowledge - Students will understand the basic chemical/biochemical principles and content in the major specialty areas, which include inorganic, organic, physical, analytical, and biochemistry. Year(s) to be Assessed: 2009-2010 2014-2015 Outcome Status: Active	Description of Assessment: Standardized American Chemical Society exam Assessment Type: Exam/Quiz - Standardized Benchmark: 35.7%	07/12/2011 - The post course assessment showed that most students (92%) performed at or above the minimum performance criterion. This compared to 61% of students for the pre-course assessment, thereby demonstrating increased mastery of content knowledge. Relative to Fall 2008 (82% achieving the minimum standard), this year?s results showed a slight improvement. Benchmark Met: Yes Reporting Year: 2009-2010 Related Documents: Assessment Summary	07/12/2011 - The performance on the standardized exam for this year's class mirrored consistent good performance on instructor created testing examination modes throughout the Fall term which were non multiple choice based. The strong performance for this year?s CHEM 204 class may have been facilitated by the recent introduction of a peer-led ChemExcel CHEM 210 course that provided students with parallel problembased examples of lecture course content. On the basis of this year?s CHEM 204 assessment, the Chemistry & Biochemistry program does not at this time propose any substantive changes.
		07/12/2011 - Relative to previous years, the results were poorer than average. For example: in the previous year (2007-08), 92% of students	07/12/2011 - This is one of the most challenging classes that science students routinely take. The

Program Outcomes	Means of Assessment & Benchmark / Tasks	Data Analysis	Closing the Loop & Follow-Up
		achieved the minimum performance criterion. Benchmark Met: Yes Reporting Year: 2008-2009 Related Documents: Assessment Summary	performance on the standardized exam for this year's class mirrored consistent poor performance on instructor created tested examination modes for the entire year which were non multiple choice based. On the basis of this year's CHEM 336 assessment, the Chemistry & Biochemistry program will undertake the following pedagogical changes: (i) Addition of an instructor-led study session to be held on Friday afternoons. (ii) Creation of a peer-led study session to be held during the evening. (iii) Continued ongoing annual assessment of the CHEM 336 course.
Program (CAS) Chemistry/Biochemistry - Communication and Critical Thinking - Students will understand the importance of the discipline to modern society and be able to communicate chemical/biochemical information both orally and in writing to their peers and the public. Year(s) to be Assessed: 2010-2011 2015-2016 Outcome Status: Active	Description of Assessment: CHEM 407: Preparation of a technical paper and seminar presentation Assessment Type: Writing Assignment Benchmark: Proficient, Adequate, Developing	10/31/2012 - This is a first time assessment; there are no previous data to compare results to. Based on this assessment, 86% of EOU students met or exceeded the minimum accepted performance level. Benchmark Met: Yes Reporting Year: 2010-2011 Related Documents: Assessment Summary	10/31/2012 - Because this is a 3-term senior class worth only one credit, students tend to procrastinate doing the work. Some suggestions for remedying this include: making the class worth more than one credit, assigning faculty mentors for each student, and requiring that each student pass the previous term prior to moving on.
Program (CAS) Chemistry/Biochemistry -			

Program Outcomes	Means of Assessment & Benchmark / Tasks	Data Analysis	Closing the Loop & Follow-Up
Applied Learning Skills - Students will acquire safe chemical/biochemical laboratory practices and techniques including the use of instrumentation and computers. Year(s) to be Assessed: 2011-2012 2016-2017 Outcome Status: Active	Description of Assessment: Outcome: Applied Learning Skills to be assessed 11-12	01/10/2013 - All thirteen students that took the assessment (or 100%) demonstrated proficiency in running instrumentation and identifying the unknown compound. Three students (or 23%) had some minor difficulties in interpreting the spectral information but were still able to identify the compound. The assessment demonstrates that students in the chemistry/biochemistry program acquire over the years the ability to operate fundamental instrumentation, interpret the data and use the information to recognize the structure of an unknown compound. Based on the results of this assessment, no modifications will be made to the curriculum. Benchmark Met: Yes Reporting Year: 2011-2012 Related Documents: Chem 422 Lab Final Chem 422 Lab Final Assessment Rubric	
Program (CAS) Chemistry/Biochemistry - Inquiry and Integrated Learning - Students will be able to design and conduct chemical/biochemical research with appropriate documentation including literature searches. Year(s) to be Assessed: 2012-2013 2017-2018 Outcome Status: Active	Description of Assessment: Due to assess Inquiry and Integrated Learning 12-13	06/10/2013 - During the 2012-2013 academic year approximately thirty students per term were engaged in Chem 401 capstone research. This group encompasses students ranging from freshmen to graduating seniors primarily from chemistry, biochemistry, and biology, with varying degrees of chemistry core knowledge and laboratory skills. Students operate in small teams with mentoring from faculty members and more experienced peers. Based on the inquiry and integrated learning assessment rubric (see attached), out of 30 students, 27% were rated proficient, 46% adequate, and 27% developing. The distribution reported above is appropriate	06/10/2013 - The distribution reported above is appropriate given different levels of academic and research experiences of the students assessed.

Program Outcomes	Means of Assessment & Benchmark / Tasks	Data Analysis	Closing the Loop & Follow-Up
		given different levels of academic and research experiences of the students assessed. Benchmark Met: Yes Reporting Year: 2012-2013 High Impact Practice (HIP) - only choose one: Undergraduate Research Related Documents: Chem 401 Assessment Rubric	
Program (CAS) Chemistry/Biochemistry - Program Review - No Assessment - Program Review Year(s) to be Assessed: 2013-2014 Start Date: 02/11/2013 Outcome Status: Active			

Curriculum Map
Eastern Oregon University
Program (CAS) Chemistry/Biochemistry

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Content Knowledge - Students will understand the basic chemical/biochemical principles and content in the major specialty areas, which include inorganic, organic, physical, analytical, and biochemistry.

- * CHEM 204 - CHEM 204 - Gen Chemistry*SMI
- * CHEM 205 - CHEM 205 - Gen Chemistry*SMI
- * CHEM 206 - CHEM 206 - General Chemistry*SMI
- * CHEM 285 - CHEM 285 - Chemical Safety
- * CHEM 320 - CHEM 320 - Analytical Chemistry
- * CHEM 334 - CHEM 334 - Organic Chem I
- * CHEM 335 - CHEM 335 - Organic Chem II
- * CHEM 336 - CHEM 336 - Organic Chem III
- * CHEM 340 - CHEM 340 - Physical Chemistry
- * CHEM 360 - CHEM 360 - Environmental Chemistry
- * CHEM 421 - CHEM 421 - Instrumental Analysis
- * CHEM 440 - CHEM 440 - Thermodynamics
- * CHEM 441 - CHEM 441 - Quantum Mechanics
- * CHEM 442 - CHEM 442 - Chemical Dynamics
- * CHEM 450 - CHEM 450 - Structural Biochemistry
- * CHEM 451 - CHEM 451 - Metabolic Biochemistry

Communication and Critical Thinking - Students will understand the importance of the discipline to modern society and be able to communicate chemical/biochemical information both orally and in writing to their peers and the public.

- * CHEM 204 - CHEM 204 - Gen Chemistry*SMI
- * CHEM 206 - CHEM 206 - General Chemistry*SMI
- * CHEM 320 - CHEM 320 - Analytical Chemistry
- * CHEM 339 - CHEM 339 - Organic Chem II Lab
- * CHEM 407 - CHEM 407 - Seminar
- * CHEM 437 - CHEM 437 - Organic NMR Spectroscopy
- * CHEM 443 - CHEM 443 - Thermodynamics Lab

Applied Learning Skills - Students will acquire safe chemical/biochemical laboratory practices and techniques including the use of instrumentation and computers.

- * CHEM 204 - CHEM 204 - Gen Chemistry*SMI
- * CHEM 205 - CHEM 205 - Gen Chemistry*SMI
- * CHEM 206 - CHEM 206 - General Chemistry*SMI
- * CHEM 285 - CHEM 285 - Chemical Safety
- * CHEM 321 - CHEM 321 - Analytical Chem Lab
- * CHEM 338 - CHEM 338 - Organic Chem I Lab
- * CHEM 339 - CHEM 339 - Organic Chem II Lab
- * CHEM 361 - CHEM 361 - Environmental Chem Lab
- * CHEM 401 - CHEM 401 - Research
- * CHEM 412 - CHEM 412 - Inorganic Chem Lab
- * CHEM 422 - CHEM 422 - Instrumental Analysis Lab
- * CHEM 437 - CHEM 437 - Organic NMR Spectroscopy
- * CHEM 443 - CHEM 443 - Thermodynamics Lab
- * CHEM 444 - CHEM 444 - Quantum Mechanics Lab
- * CHEM 445 - CHEM 445 - Chemical Dynamics Lab

* CHEM 454 - CHEM 454 - Biochemistry Lab

Inquiry and Integrated Learning - Students will be able to design and conduct chemical/biochemical research with appropriate documentation including literature searches.

* CHEM 204 - CHEM 204 - Gen Chemistry*SML

* CHEM 321 - CHEM 321 - Analytical Chem Lab

* CHEM 339 - CHEM 339 - Organic Chem II Lab

* CHEM 361 - CHEM 361 - Environmental Chem Lab

* CHEM 401 - CHEM 401 - Research

* CHEM 437 - CHEM 437 - Organic NMR Spectroscopy

Program Outcomes - Assessment Cycle

Year(s) to be Assessed	Program Outcome Name	Unit Name
2009-2010	Content Knowledge	Program (CAS) Chemistry/Biochemistry
2010-2011	Communication and Critical Thinking	Program (CAS) Chemistry/Biochemistry
2011-2012	Applied Learning Skills	Program (CAS) Chemistry/Biochemistry
2012-2013	Inquiry and Integrated Learning	Program (CAS) Chemistry/Biochemistry
2013-2014	Program Review - No Assessment	Program (CAS) Chemistry/Biochemistry
2014-2015	Content Knowledge	Program (CAS) Chemistry/Biochemistry
2015-2016	Communication and Critical Thinking	Program (CAS) Chemistry/Biochemistry
2016-2017	Applied Learning Skills	Program (CAS) Chemistry/Biochemistry
2017-2018	Inquiry and Integrated Learning	Program (CAS) Chemistry/Biochemistry