

INSTITUTIONAL EFFECTIVENESS REVIEW

~ Chemistry / 2007-2008 ~

The purpose of the review is to:

Assess the scope, strengths, weaknesses and needs of the Chemistry Program at Jefferson College.

The process will involve the following steps:

The Chemistry faculty met with Dean Selsor on November 11, 2007 to discuss the Institutional Effectiveness Review process as it applied to Chemistry.

The Chemistry Institutional Effectiveness Review document was completed based on data compiled by the Director of Institutional Research and the Chemistry faculty.

The Chemistry faculty met again with Dean Selsor on February 29, 2008, to discuss the findings presented in the Institutional Effectiveness Review document.

Additional follow-up meetings were scheduled as needed to assess the status of Learning Goals and Action Plans.

Time frames/timeline for the review were:

The initial meeting with Dean Selsor took place during the Fall 2007 semester.

The Institutional Effectiveness document was turned into Dean Selsor by early February 2008.

The follow up meeting with Dean Selsor took place in late February, 2008.

Additional follow-up meetings were scheduled as needed.

Program/Service:

Date of Review:

Review Participants: *Sean Birke & Ryan Groeneman*

Overview

Purpose of the program and how it relates to college mission, values, vision:

The vision and purpose of the Chemistry program at Jefferson College is to provide students with a supportive learning environment that promotes intellectual, social and personal growth. The faculty work as facilitators to encourage critical thinking, problem solving and exploration in the field of Chemistry. Students are given the opportunity for hands on experience through exercises completed in the Chemistry labs in conjunction with course material.

The Chemistry Department at Jefferson College strives to provide a thorough and in-depth coverage of the subject area through the sophomore year. Chemistry courses offered regularly include Introductory Chemistry, Concepts in Chemistry, General Chemistry I and II, and Organic Chemistry I and II. A sound understanding of the chemical sciences will facilitate students' progress in the natural sciences and the allied health field, as well as enhance their understanding of the natural world. Furthermore, the Chemistry program at Jefferson College hosts a strong and rigorous program that effectively provides a strong educational background in the chemical sciences enabling students to successfully transfer to four-year institutions.

Institutional Effectiveness Review

Present Status

Learning/Service and Action from 2003 Institutional Effectiveness Review:

<i>Learning/Service Goal</i>	<i>Assessment Measurement/ Action</i>	<i>Person(s) to Implement</i>	<i>Timeframe</i>	<i>Resource Implications</i>	<i>Use of results</i>
Goal 1 Purchase needed equipment per prioritized equipment list	Purchased equipment as needed	Sean Birke/Ryan Groeneman	Academic Year 2005-2007		Equipment and supplies used to support Chemistry classes
Goal 2 Develop a 3-hour Concepts in Chemistry course	Course developed - traditional and on-line delivery	Ryan Groeneman	Offered first time, Fall 2005, on-line, Spring 2008	Course Development funds	Course offered traditional delivery and on-line
Goal 3 Change pre-requisite for CHM111 General Chemistry to add a "C" or better in CHM101 Introductory Chemistry	Determined not necessary				
Goal 4 To support the program, faculty and an additional adjunct lab assistant are needed	Added a full-time lab assistant and full-time faculty member	Administration and faculty	Lab Asst, Fall 2007 & Fall 2008		

Innovative Changes (in last 5 years):

1. A new liberal arts minded chemistry course, Concepts in Chemistry, was proposed and first offered during the Spring 2005 semester.
2. Concepts in Chemistry was offered as an online option for the first time during the Spring 2008 semester.
3. Introductory Chemistry, CHM 101, was offered at Jefferson College's Arnold location for the first time during the Fall 2007 semester.
4. The materials covered in both semesters of Organic Chemistry, CHM 200/201, were adapted to the use of WebCT and Smart technology.
5. A customized laboratory manual was developed for Introductory Chemistry.
6. The chemistry laboratories at the Hillsboro campus were renovated, Summer 2007.

7. An additional laboratory assistant was hired to help assist in laboratory instruction.

Faculty (Degree to which faculty are qualified, effective, and supported.)

Faculty Qualifications and Professional Development:

Name	Title	Highest Degree	Institution	Graduate Hours
Sean Birke	Associate Professor	M.S. Chemistry ABD Biochemistry	University of Wisconsin-Madison University of Missouri-Columbia	116
Ryan Groeneman	Associate Professor	Ph.D. Chemistry	University of Missouri-Columbia	74

Sean Birke graduated from Occidental College in Los Angeles with a B.A. in Chemistry and a research emphasis in Biochemistry in which he determined the kinetic mechanism of human erythrocyte Glucose-6-phosphate dehydrogenase. Over the next two years, Mr. Birke pursued and completed a M.S. degree in Organic Chemistry under the direction of Bob McMahon, at the University of Wisconsin-Madison. The focus of the research was organic non-linear optic materials. From Wisconsin, Mr. Birke moved to the University of Missouri at Columbia from 1990 to 2000. There, under the direction of Dave Emerich, he studied the genetic regulation of the malate dehydrogenase gene from *Bradyrhizobium japonicum* and its supporting role in nitrogen fixation in the soybean. He is currently A.B.D. Mr. Birke was also nominated to Who's Who Among America's Teachers in 2003.

Ryan Groeneman has been a Professor of Chemistry at Jefferson College since 2001. He holds a Bachelor of Science Degree in Chemistry from Southern Illinois University at Edwardsville and a Ph.D. from the University of Missouri-Columbia in Chemistry. His research project focused on coordination polymers and inorganic networks. He received the award for the Outstanding Teaching Assistant from the Men of Engineering at the University of Missouri-Columbia in May 2000. He was also nominated to Who's Who Among America's Teachers in 2004. Dr. Groeneman has taught all the Chemistry classes offered at Jefferson and currently serves on the Faculty Senate Executive Council.

Faculty Data:

Faculty Indicators for Chemistry Instructional Program Review, 2003-2007 School Terms 200301 Through 200703 (Summer 2002 through Spring 2007)

Number of Terms Taught (Max = 15)	Number of Course Sections Taught	Total Students	Attrition Number ("W" Grades)	Attrition Percent	Graded Credit Hours (A to F grades)	Average Students	Average GPA	Annualized 5-Year Program FTE
41	93	2,245	231	10.3%	9,322	24.1	2.45	62.1

Source: BANNER report WSHRGDST printed 29 October 2007.

Notes: Attrition is the number of "W" grades conferred.

Annualized Program FTE is the number of graded credit hours divided by 150 (30 hrs/yr for 5 years).

Graded Credit Hours are "A to F" only, not "W, I, H, P/F, or Other"

Students (The degree to which student needs are met.)

Enrollment in Chemistry courses has increased from 1836 annual credit hours in 2003 to 2714 in 2008, an increase of 47.8%

Student Satisfaction and Feedback:

As a rule, students are very satisfied by the education provided by the chemistry department. Each semester, tenured faculty conduct student evaluations in one section, and all non-tenured and adjunct faculty members conduct student evaluations in all sections. For review purposes, student evaluations were conducted in all sections during Fall 2007. Students are generally satisfied with the Chemistry course offerings at Jefferson College. They appreciate the use of technology in the classroom to augment the communication of challenging chemical concepts. They generally find that the labs are meaningful, useful and helpful in assisting their grasp of chemical concepts. Generally, they find the textbooks used to be helpful, though there has been some reservation regarding the text used for CHM 101, Introductory Chemistry. In general the instructors are well received and knowledgeable. Students also find them to be quite helpful and willing to assist them in their learning endeavors.

Student Success:

In general student attrition rate is low in the Chemistry courses taught at Jefferson College. For those not fulfilling requirements for the nursing program or the veterinary technology program there is positive movement through the Chemistry sequence from Introductory Chemistry to General Chemistry and for those who need it, Organic Chemistry. Those students who complete Introductory Chemistry with a grade of C or better and move onto General Chemistry generally fair fine in General Chemistry sequence.

Curriculum (The degree to which curriculum is thorough, current, and supported.)

Curriculum (Scope, Currency, Changes):

All course syllabi have been revised, updated and placed on file in Arts and Sciences room 110 at Jefferson College and on the web.

The following web address provides links to the general education distribution matrix of courses which identifies the state-level goals and associated institutional-level competencies. Individual course reporting matrices are provided by faculty and support documentation for the general education program, specifically, the Jefferson College Long Range Plan and the Jefferson College Student Outcomes Assessment Plan. Assessment documentation is on file in AS110.

<http://www.jeffco.edu/acadprog/gened/index.htm>

CHM101 Introductory Chemistry
CHM102 Concepts in Chemistry
CHM111 General Chemistry I
CHM112 General Chemistry II
CHM113 General Chemistry II Laboratory
CHM200 Organic Chemistry I
CHM201 Organic Chemistry II

Curriculum Issues (Support, Technology, Equipment)

Jefferson College has made a commitment to encourage and support the use of technology campus-wide. In the fall of 2003, the campus went on-line with STARS (Smart Technology and Remote Services). Chemistry faculty are using this technology as a way to communicate. Recently the science laboratories have augmented with SMART technology, and students are gaining valuable technological experience as a result. The

Chemistry Program has incorporated a web-based course into the curriculum, Concepts in Chemistry.

Community (The degree to which the program contributes to the community responds to community needs)

The Chemistry Department at Jefferson College serves as a resource for the Jefferson County community. When solicited it provides a source of expert advice to assist in addressing individual concerns and interest. Members of the Chemistry Department routinely serve as judges for the Mastodon Art and Science Fair and for the International Science and Engineering Fair. In addition the chemistry faculty have participated in Math and Science Night sponsored by Jefferson College.

Cost

A summary of the Chemistry budget for 2003-2007 is on file in the Office of the Dean of Arts and Sciences Education. The full-time instructional cost per FTE for Chemistry courses is \$2,467.21.

Summary (SWOT)

Strengths	Weaknesses
<ul style="list-style-type: none">• Talented, well educated faculty with a strong diverse background.• A strong growth in enrollment• High student retention• A variety of course options• Online course options• New and renovated laboratories (217A & 217B)	<ul style="list-style-type: none">• Need upgrade in instrumentation.• Need to communicate and coordinate more effectively with adjunct.
Opportunities	Threats
<ul style="list-style-type: none">• The new laboratories at Jefferson College-Arnold offer an increase in course availability and possible offerings outside of the main campus in Hillsboro.• An increase in the offering of Concepts in Chemistry as an online option.• An increase in the demand for Nurses and others going into the health professions.	<ul style="list-style-type: none">• Reduction in state funding.• A decline in Science and Engineering majors.

Future (Proposed Learning and Service Goals and Action Plan)

<i>Proposed Learning/Service Goal</i>	<i>Proposed Assessment Measurement/Action</i>	<i>Person(s) to Implement</i>	<i>Timeframe</i>	<i>Resource Implications</i>
Goal 1 Change the textbook used for CHM 101.		Faculty	Summer 2008	Time/input
Goal 2 Upgrade instructional supplies with new Organic lab kits (8 at \$600 each) and Organic lab software for NMR	Written request	Faculty and Division Chair	Fall 2009-2012	Instructional Supplies Budget \$ 5,600 (phase in)
Goal 3 Upgrade instructional equipment that characterizes organic molecules - <i>Fourier Transform Infrared Spectrophotometer (FT IR)</i>	Written request	Faculty and Division Chair	As budget permits	Capital funds \$25,000

DISCIPLINE STATUS

 X Satisfactory
 Requires Immediate Attention
 Unsatisfactory

Dean

Date