PROGRAM REVIEW

Fairmont State Board of Governors

☐ Program with Special Accreditation ☒ Program without Special Accreditation

Date Submitted 4/5/13

Program: BS in Chemistry
Degree and Title

INSTITUTIONAL RECOMMENDATION

The institution is obligated to recommend continuance or discontinuance of a program and to provide a brief rationale for its recommendation:

X **1. Continuation of the program at the current level of activity;**

_____ **2. Continuation of program with corrective action (for example, reducing the range of optional tracks or merging programs);**

_____ **3. Identification of the program for further development (for example, providing additional institutional commitment);**

_____ **4. Development of a cooperative program with another institution, or sharing courses, facilities, faculty, and the like;**

_____ **5. Discontinuation of the Program**

Rationale for Recommendation:

The faculty in the Chemistry program has made considerable improvements in attracting and retaining students since their last program review. The faculty has further made necessary adjustments to the curriculum and student outcomes to address programmatic needs. Graduates of the program are successful in obtaining employment in West Virginia or seeking additional education via graduate school. The program faculty needs to continue with the collection of assessment data. The continuation of this program is highly recommended by the Dean of the College of Science and Technology.

Harry N. Baxter, III Signature of person preparing report:	3/20/13 Date
Anthony J. Gilbert Signature of Dean	4/15/13 Date
Kristina Lavorata Signature of Provost and Vice President for Academic Affairs:	4-18-13 Date
Maria C. Love Signature of President:	5-13-13 Date
Ken L Tucker Signature of Chair, Board of Governors:	5-16-13 Date

Executive Summary for Program Review

(not to be more than 2-3 pages)

Name and degree level of program

B.S. Degree in Chemistry, College of Science and Technology

External reviewer(s)

Dr. Garry Glaspell
US Army Corps of Engineers ERDC; Chemist
Fellow, Center for the Study of Biological Complexity (VCU)
Collateral Professor, Department of Chemistry (VCU)

Synopses of significant findings, including findings of external reviewer(s)

The American Chemical Society (ACS) "promotes excellence in chemistry education for undergraduate students through approval of baccalaureate chemistry programs." (ACS Guidelines, Spring 2008) Formal national approval of the FSU chemistry program by the American Chemical Society in 2009 was followed by significant curriculum revisions to meet new guidelines of the ACS and to attract additional strong students to the program. As noted by our external reviewer, a major strength of our program lies in the strength of our graduates, who exhibit an impressive level of confidence, competence, independence and achievement, as well as a 97% placement rate in employment or graduate education. The chemistry faculty are committed to the open communication and information sharing necessary for effective teamwork, and to fostering strong faculty-student relationships at all levels of the curriculum. Additional strengths include our large and successful service role within the College of Science and Technology, as well as with programs from Pierpont Community & Technical College.

Plans for program improvement, including timeline

Guidelines from the ACS (Spring 2008) specify: "Approved programs offer their students a broad-based and rigorous chemistry education that provides them with the intellectual, experimental, and communication skills to participate effectively as scientific professionals. Offering such a rigorous program requires an energetic and accomplished faculty, a modern and well-maintained infrastructure, and a coherent chemistry curriculum that incorporates modern pedagogical approaches." To continue to meet these guidelines, we need to work in the coming five years to strengthen our infrastructure by improving fume hood adequacy, replacing an aging chemical storage facility, replacing and updating instrumentation, and ensuring continued access to ACS-specified journals. We also plan to continue work on recruitment and retention of qualified students as chemistry majors, as suggested by our external reviewer. One goal is to work towards having students choose an actual major when they enter the institution (as opposed to being listed as pre-medical, for example, for most of the time they spend at the institution.) Recruitment and retention are also top priorities for Dr. Anthony Gilberti, Dean of the College of Science and Technology, who has written a grant to fund a STEM center that will focus on encouraging student retention and success in introductory science and math courses.

Identification of weaknesses or deficiencies from the previous review and the status of improvements implemented or accomplished

Written program review findings were not provided on the program review submitted in the spring of 2008, and the 2008 program reviews are not posted on the Board of Governors website as of 2/1/2013. Dr. Gilberti, Dean of the College of Science and Technology, indicated (phone conversation on 1/31/2013) that the only program review recommendation from 2008 was to increase the number of chemistry majors in the program. To address the number of majors, we earned approval by the American Chemical Society, which provides a mark of national excellence and a recruiting tool for well-prepared students. We also worked to tailor our curriculum for our student population, by providing flexibility in the sequencing of courses. We redesigned the first year course sequence to appeal to the large number of pre-professional students who take those courses and who often also have the interest, academic preparation and work ethic needed to succeed as chemistry majors. We involved our American Chemical Society Student Affiliates club in visiting high schools and performing chemical demonstrations, as well as helping with on-campus recruiting events such as the Science and Engineering Challenge.

Five-year trend data on graduates and majors enrolled

The number of graduates and the number of chemistry majors has increased over the past five years. The number of majors (see Table 1 on page 21) increased from 30 in the fall of 2007 to 48 in the spring of 2012 (with an average of 37 students for 2007-12). The number of graduates from the chemistry program, while highly variable from year to year, increased from 6 in 2008 to 11 in 2012 (mean 5.4 ± 3.4). See Table 2 on page 21.

Summary of assessment model and how results are used for program improvement

Assessments, improvements and modifications that we conduct in our courses and program are designed to maintain our program within the guidelines for continued approval by the American Chemical Society. Course and program-level assessment is undertaken by the program faculty in consultation with our chemistry advisory board, and assessment plans and data are stored in TaskStream. We engage students in a coherent curriculum, designed around concrete learning outcomes that build from course to course. Program threads are embedded in our courses and feed into our program outcomes. We are committed to building skills in our lower-level courses to provide the means of success in higher-level courses and after graduation, and we track the success of this process with specific assessments defined for each course and program outcome. Findings are discussed in program meetings and changes are made as necessary to improve student learning and success.

Data on student placement (for example, number of students employed in positions related to the field of study or pursuing advanced degrees)

Chemistry program graduates from 2007-12 are 97% employed or pursuing graduate study, largely in chemistry-related fields. We maintain close contact with our graduates, of whom 66% are employed in field, 7% employed out of field, 17% enrolled in graduate school in field, and 7% enrolled in professional school (e.g., medical, dental, pharmacy).

Final recommendations approved by governing board

PROGRAM REVIEW

FAIRMONT STATE UNIVERSITY OR PIERPONT COMMUNITY AND TECHNICAL COLLEGE	
Program:	Chemistry
School:	College of Science and Technology
Date:	

Program Catalog Description:

The chemistry program's mission is to help students gain a fundamental knowledge of modern chemistry, including the ability to apply computer science, mathematics, biology and physics to the field. The program strives to foster excellent oral and written communication skills, and is approved by the American Chemical Society. With small class sizes, innovative teaching approaches, and hands on access to modern, research-quality instrumentation, students can develop the analytical, problem-solving and teamwork skills necessary to successfully pursue science based careers. A student completing the B.S. degree with a major in chemistry will be competitive for graduate study in chemistry or chemical engineering, laboratory positions in the chemical industry, pharmaceutical industry or government agencies, or application to law school. By electing a few additional biology classes, students completing a B.S. degree in chemistry will be prepared for application to a variety of professional and graduate schools, including medical school, dental school, veterinary school, pharmacy school, physical therapy programs, toxicology, pharmaceutical science and forensic science graduate programs.

Programs available for students who wish to specialize in chemistry include:

1) The B.S. in Chemistry is certified by the American Chemical Society and provides a well-balanced program of courses in the major fields of chemistry, as well as mathematics and physics. A student completing this program will be a competitive candidate for graduate study or positions in industry or government agencies.

2) The B.S. in Chemistry with an emphasis in biotechnology provides chemistry majors with an additional grounding in biology and prepares students for professional schools and graduate study in forensic science and pharmaceutical sciences.

3) The B.A. in Education with a specialization in chemistry equips the graduate to teach chemistry in any secondary school or to pursue graduate studies in science education.

VIABILITY (§ 4.1.3.1)

Enrollments

Applicants, graduates

While our majors tend to be well-prepared academically, any student admitted to the university can declare a major in chemistry. Enrollment in the first year chemistry course requires an ACT math score of 20; SAT math 480 or better (or equivalent). Students who do not meet this requirement can still declare their major as chemistry but need to complete remedial courses before beginning the curriculum.

Chemistry majors during the fall and spring semesters of the academic years of 2007 – 2012 averaged 37 students, with a standard deviation of 7 students. The minimum number (29) occurred in spring 2008 and the maximum in the spring of 2012 (48) (Refer to Table 1 on page 21).

Graduation rates during this same time period have ranged from 2 in 2010 to 11 in 2012 (mean 5.4 ± 3.4) (Refer to Table 2 on page 21). Graduates are reported by academic year (Fall 2007 graduates are reported in the 2008 year). Table 2 shows the number of graduates has increased in the recent years.

We have compiled a list of all recent graduates and to the best of our knowledge, their current employment or continuing education status (Refer to Table 6 on page 25). The chemistry program tracks graduates as part of their American Chemical Society Annual Report. A summary of what graduates are doing is given below. Chemistry program graduates are 97% employed or pursuing graduate study, largely in chemistry-related fields.

Education and/or Employment Status of Recent Graduates of the Chemistry Program (2007-2012)

	Graduates	
Category	Number	Percent
Employed in Field	19	66
Employed out of field	2	7
Graduate school	5	17
Professional school	2	7
Seeking Employment	1	3
Total	29	100

Positive aspects of the Chemistry Program:

- Impressive level of confidence, competence, independence and achievement exhibited by graduates.
- Strong faculty-student relationships, student-centered program decisions
- Faculty committed to the open communication and information sharing necessary for effective teamwork.

- A coherent curriculum, designed around concrete student learning outcomes that build from course to course.
- Small class size and active learning strategies
- Hands-on experience with instrumentation throughout the curriculum

Areas that will strengthen our Chemistry Program:

- **Tailor curriculum for the student population and clarify the status of pre-professional programs**
  We have a large service population in our first-year chemistry courses since all pre-professional students take those courses. Thus, our goal has been to design the first year course sequence to appeal to students who have the interest, academic preparation and work ethic needed to succeed in chemistry (see Assessment section). A chemistry major provides an excellent preparation for graduate and professional schools of all sorts, and we are starting to see some success with encouraging students who come in as "pre-medical, pre-pharmacy, pre-dental" students, especially, to declare a major in chemistry. Our numbers of chemistry majors would increase significantly if students had to choose an actual major when they enter the institution (as opposed to being listed as pre-medical, for example, for most of the time they spend at the institution.) While it is not possible to graduate with a major in pre-medical studies, incoming students don't realize that, and have no particular incentive to declare a true major.

- **Increase student population**
  We are working towards increasing our recruitment efforts, with our American Chemical Society Student Affiliates club visiting high schools and performing chemical demonstrations, as well as helping with on-campus recruiting events. Recruitment and retention are top priorities for Dr. Anthony Gilberti, Dean of the College of Science and Technology. Dr. Gilberti has written a grant to fund a STEM center in our college that will focus on encouraging student retention and success in introductory science and math courses, and we are excited about the opportunity for support as we continue to work on these critical goals through curriculum design and implementation.

Program courses

Students majoring in Chemistry complete ten core chemistry courses (Refer to Appendix III – B.S. Degree in Chemistry – Compliance with the Degree Definition Policy on page 47). In addition students are required to complete two semesters of Calculus and Physics as well as the FSU general studies requirements. Students pursuing a chemistry certification for their education degree complete five core courses.

Enrollments in courses for the chemistry major are provided in Table 3 on page 22. CHEM 1113 was removed from the curriculum following the spring 2010 semester.

Table 3 shows a significant difference in the number of students enrolled in CHEM 1105 and

CHEM 1106 as compared to the upper-level courses. At first glance this might be considered a retention issue (retention is discussed in the Graduation/Retention section). However, CHEM 1105 and 1106 are also service courses because other programs require these courses, but not necessarily the upper-level courses; for example: Biology, Exercise Physiology, Forensic Science, Biotechnology Area of Emphasis, and many pre-professional areas of study.

Service courses

Service courses outside the Chemistry major:

CHEM 1101 – General Chemistry I

CHEM 1102 – General Chemistry II

CHEM 2225 – Forensic Microscopy and Spectroscopy

Demand for service courses remains high, with students in medical laboratory technology, veterinary technology, architecture engineering technology, civil engineering technology, mechanical engineering technology, electronics engineering technology, and occupational safety engineering technology taking Chem 1101 and students in some of these programs also taking Chem 1102.

There are a few students in programs that enroll in Chem 1101 to satisfy FSU's General Studies requirement. Some students take Chem 1101 and possibly Chem 1102 in order to prepare themselves to take the major's level Chem 1105 course.

Some sections of these courses are taught by adjuncts, but the goal of the program is to have at least one full time faculty member teaching a section of these courses every term. The full time faculty member serves as a point of contact for the adjunct instructors. Chem 1101 is offered every semester and in the first summer term. Chem 1102 is offered in the spring semester and in the second summer term.

Forensic Science majors are required to take Chem 2225 as a major requirement. The course was recently changed from being offered every year to every other year and resulted in the largest class size (13 students) in the history of this course.

Enrollments in service courses for the chemistry program are provided in Table 4 (Refer to page 23).

Success rates Service Courses

Service course success rates are provided in Table 5 on page 24. In this table "success" is defined as the percentage of students who received a grade of A, B, C or AU (audit) compared to all students who received a grade (A,B,C,D,F,W) for the course. Students who dropped the

course prior to the drop deadline are not included. Overall the success rate in service courses ranges from 73% to 100%. The 100% success rate was for an honors section of CHEM 1101. The average success rate is 87.0% (median 87.5%).

Extended education / off campus Courses

None of the science courses for chemistry majors are taught off of the main campus.
Table 7 on page 26 lists all courses taught on and off campus. Of the courses listed, 87.5% of the students are instructed on the main campus.

Cost/student credit hour

We don't have access to specific costs for the chemistry program. Alternatively, presented below are the costs for our College of Science and Technology compared to other Schools and Colleges at FSU. As Figures 1 and 2 illustrate, our cost per credit hour are at the average for the institution and the costs per Student FTE Major are second highest, but far below the School of Fine Arts.

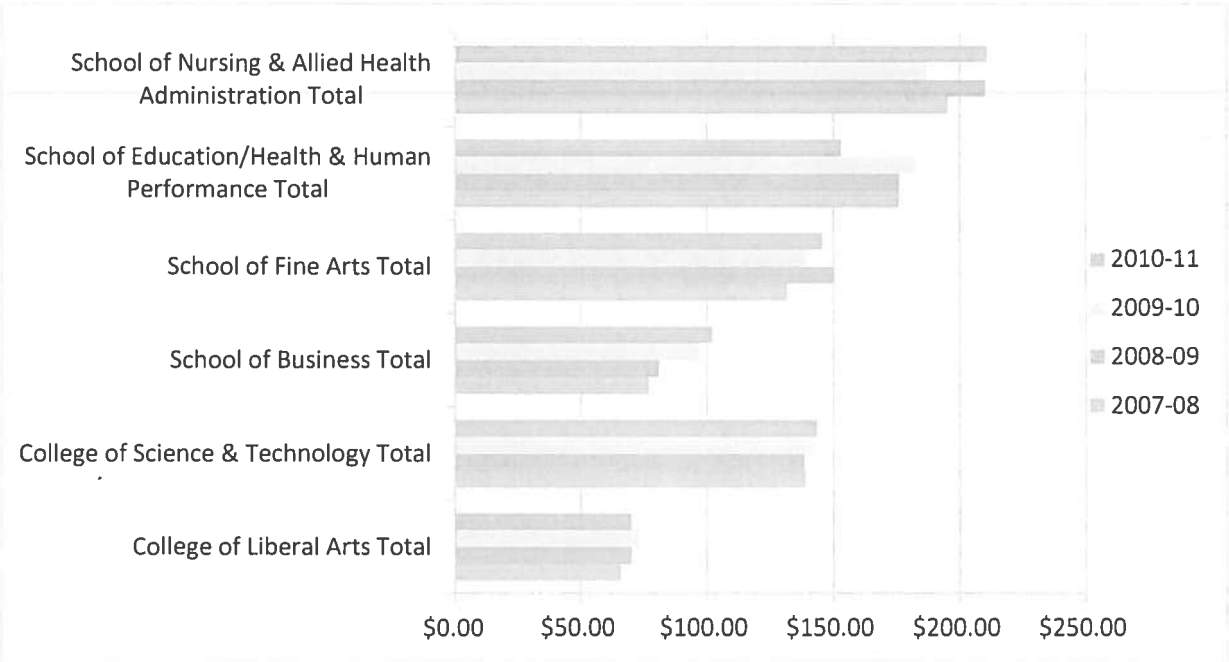


Figure 1: Direct cost per instructional credit hour by School/College for 07-08, 08-09, 09-10, and 10-11.

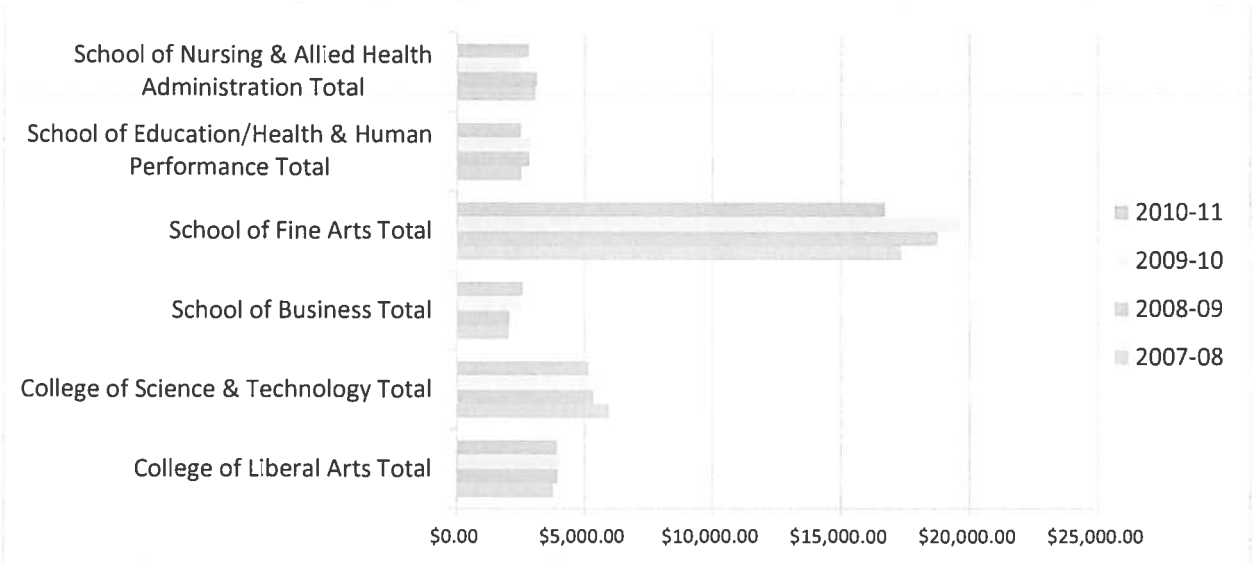


Figure 1: Direct cost per Student FTE Major by School/College for 07-08, 08-09, 09-10, and 10-11.

Liberal Studies Requirements Met

The chemistry program is in compliance with the Fairmont State Degree Definition Policy. (Refer to Appendix III – Compliance with Degree Definition Policy – B.S. Degree in Chemistry on page 47.)

Chemical Principles (CHEM 1105) has been submitted to satisfy quantitative reasoning and natural science attributes in our new general studies curriculum, and all of our courses promote problem solving. Physical Chemistry II has been submitted to address teamwork in our new general studies curriculum, and most courses include team assignments. Our majors all take COMM 2200 Intro to Human Communication and give presentations in various courses (poster, oral and online). We are committed to having students practice presenting and have used organic poster sessions, inorganic presentations, synthetic methods poster presentations, demonstrations and derivation presentations in physical chemistry, and protein presentations in Chem 1106. Ethics is addressed explicitly in the Chemical Principles course with a Calibrated Peer Review (CPR) assignment (Ethics in Pathological Science) followed by a citation activity in Foundational Biochemistry. Plagiarism/teamwork/citation issues are discussed frequently because every course includes a variety of assignment types that require student writing and research. Students also write lab reports in every course, and these are graded using a rubric that increases in sophistication as students' progress. Physical Chemistry I (Chem 3301) is designated as the program's writing intensive course.

Assessment Requirements

National approval requirements

With the formal, national approval of our chemistry program by the American Chemical Society (ACS) in the fall of 2009, we began providing annual and periodic (5-year) reports to the ACS. Assessments, improvements and modifications that we conduct in our courses and program are designed to maintain our program within the guidelines for approval by the American Chemical Society. New guidelines established by the American Chemical Society in the last five years resulted in a large curriculum revision begun in 2009 and formally approved in the fall of 2011.

Advisory Board and program faculty contributions

Since our last program review, we have instituted a formal advisory board consisting of representatives from industry and other educational institutions, and meet with them most years. They have provided very useful feedback, most recently on our curriculum revision.

The chemistry program meets weekly, and maintains a strong collegial atmosphere with respect to sharing assessment information from various courses and perspectives. We work regularly on improving our program and courses, using a mixture of anecdotal and quantitative data. We use program meetings to discuss necessary changes on the course and program level, and faculty or teams of faculty responsible for each course implement the changes and report on results.

Institution-wide assessment

Fairmont State University uses TaskStream to store program- and course-level assessment data, with annual assessment plans including student learning outcomes, specific and direct methods of assessment for each outcome, assessment data, and how the data are used to improve student learning. The chemistry program began this process in 2007, and it has enabled us to develop and maintain a coherent curriculum, designed around concrete student learning outcomes that build from course to course. In addition to results of signature assignments as measures of program outcomes, graduating seniors take the ETS test in chemistry and the ACS Diagnostic of Undergraduate Chemistry Knowledge (Form 2008) test. We also use standardized tests from the American Chemical Society to assess the performance of the students in the following classes: CHEM 1105/1106 (now 2200), CHEM 2201/2202, CHEM 2205, CHEM 3301/3302 (now 4412), BIOL 3360 and CHEM 4450 (now 3304). In addition, we administer the California Diagnostic Test for our incoming students in CHEM 1105. While we do not structure our courses or curriculum to match these course-level tests, we use them to provide us with a baseline to assess the effects of changes in these courses.

2011-12 Assessment Plan

B. S. in Chemistry - Program Outcomes *Upon successful completion of this program, students will be able to:*	**Direct assessment measure** *Student performance with respect to this outcome will be measured by:*
1. Demonstrate competency in the laboratory skills expected of a practicing chemist.	Specified outcomes in a. Chem 3301 (Physical Chemistry I) b. Chem 3315 (Instrumental Analysis) c. Chem 4404 (Synthetic Methods and Materials) d. Chem 4412 (Physical Chemistry II)
2. Demonstrate foundational knowledge needed by chemical professionals.	Performance on ETS tests and ACS standardized exams
3. Solve chemistry problems using mathematical and computational tools.	Performance on selected projects: a. CHEM 2205 Nonlinear least squares fit to titration curve b. CHEM 4412 Computational Chemistry: Rotational spectrum of anions found in space
4. Apply foundational knowledge to analyze complex problems.	Performance on selected projects: a. Chem 4404 Green Chemistry Challenge b. Chem 4412. Analysis of HCl-DCl spectrum
5. Competently access, evaluate and learn new chemical information and skills.	Performance on selected projects: a. Chem 4404 STN project (access and evaluate new information) b. CHEM 3315 Instrumental Analysis. Determining pH from Beer's Law (learn new information)
6. Identify the relationships between chemistry and other disciplines, and the applications of chemistry in society.	Performance on selected projects in CHEM 3301: a. Open-ended modeling project b. Stratospheric Ozone Kinetics modeling
7. Speak, write and listen critically.	Performance on selected projects: a. Students present an instrumental technique in CHEM 3315 b. Students prepare and present a poster in CHEM 4404 c. Students write a lab report on an open-ended laboratory project in CHEM 3301 d. Students critique archived derivation presentations in CHEM 4412

Course outcomes build to program outcomes

Course outcomes are revisited periodically and modified for course and program improvement. Program threads are embedded in our courses and feed into our program outcomes. We are committed to building skills in our lower-level courses to provide the means of success in higher-level courses and after graduation. For example, one program outcome is about learning and accessing new information. Students in CHEM 1105 Chemical Principles access an ACS journal article and analyze its structure. Students also research safety and physical properties for chemicals in CHEM 1105 and learn how to use the Merck Index, CRC handbook, MSDS, and

chemical company sites to access information. All subsequent laboratory courses require this skill. In CHEM 2200 Foundational Biochemistry students access an ACS journal article and then follow a citation to another article, and analyze the citation process. Organic students complete an introductory assignment using STN (literature searching software specific for chemistry) to find a synthetic procedure for a specified compound. STN is then used at a more detailed level in the Synthetic Methods course. Students in Instrumental Analysis access a variety of books and websites to learn about chemical instrumentation. The skills are assessed by grading of assignments in each course.

Examples of program improvement based on assessment data (closing the loop):

Several examples give a flavor of our assessment cycle processes:

-- In the past five years, our program undertook a major curriculum revision with the advent of new ACS curriculum guidelines, and with input from our Dean, our Provost and our Advisory Board. One substantive goal was to attract more chemistry majors from our large pre-professional population by making the first year obviously relevant to their biochemical interests. We also needed to ensure that we could populate our upper-level courses, and we were excited about the opportunity to let students take different paths through the program. We have lost students in the past because there were so many stacked courses to take and they didn't realize they were interested in chemistry until their second or third year in college. The new curriculum is formally in place for the 2012-13 academic year, though we began the transition in the past two years. We suspect that we have already begun to see the results in increased number of declared chemistry majors, mainly due to increased flexibility in course sequencing.

--Our Science Education coordinator worked with us to fill out an NCATE report and with a careful examination of our course and program outcomes in 2007-8 we discovered that our chemical education students did not have formal training in chemical safety. As a result, we have now added safety and chemical storage experiments and learning outcomes to the curriculum for all students. This provides strong support for program outcome 1.

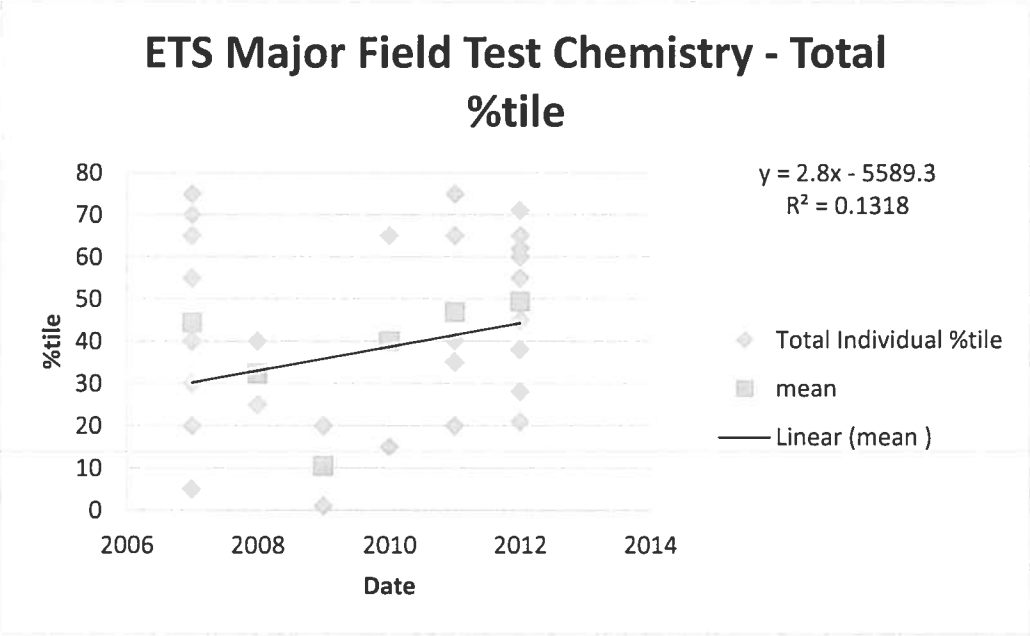
--When we decided to submit CHEM 3301 Physical Chemistry I as a writing-intensive course for the institution, we looked at lab report scores (included as a measure of program outcome 7) and realized that our expectations went up very suddenly in this course compared to previous courses. As a result, we developed more formal rubrics for lab report grading in the earlier courses in the curriculum, and consciously paid attention to adding skills with each course.

--With our first offering of CHEM 1106 (now CHEM 2200) with a biochemical focus, we added an independent Deep View assignment for protein viewing. Based on student feedback (poor performance and massive distress!) from the first year, we moved the assignment to the laboratory portion of the course where we could provide much more support for student learning. The second year, student submissions, as well as student perception of the assignment and its benefits, improved dramatically.

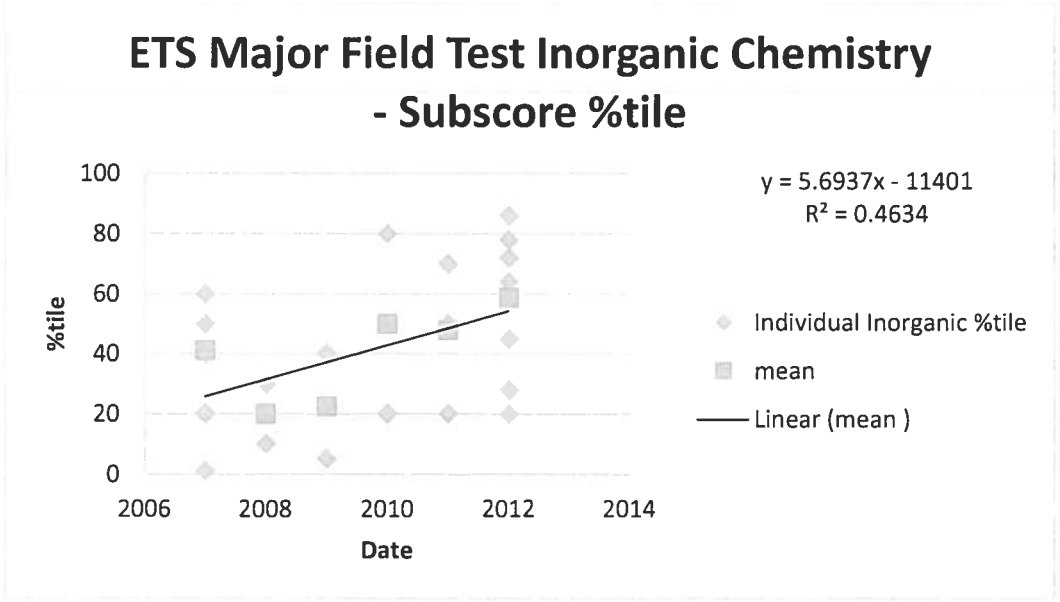
--We realized that the signature assignments used to measure many program outcomes (e.g., Outcomes 1, 3, 4 and 5) are designed as mastery assignments and students get an opportunity to resubmit improved work. This means that almost all students eventually master the assignment, which is excellent for learning but doesn't result in very usable assessment data. We are piloting

the idea of recording a score for the first attempt, as well as the number of attempts taken for mastery, in hopes of obtaining a finer level of detail about student capabilities on these program outcomes.

--Administration of ETS major field test for graduating seniors.
This test allows us to compare our graduating majors with the national norm in the areas of physical, organic, inorganic and analytical chemistry. While the average percentile scores bounce dramatically given the small sample size each year, a modest upward trend is visible over the past 6 years (see graph below). Our strongest students each year consistently score in the 60-75th percentile nationally, so we know that our program does provide the essential chemical knowledge assessed on these exams. The range of scores each year is shown in blue. We believe the size of the range largely reflects differing abilities of students to take standardized tests, though there is some correlation between final grades in chemistry courses and scores on the standardized tests.



--Subscores on the ETS Major Field Test can also be used (cautiously) to measure content changes in courses. For example, as part of our curriculum revision, we strengthened our treatment of descriptive chemistry in CHEM 4450 (now CHEM 3304) Inorganic Chemistry. The first group of students who had the new course took the ETS exam in 2012, and as seen in the graph below, the average performance for this group did increase relative to the previous 5 years, with the average above the 50th percentile on this test of foundational knowledge in inorganic chemistry. The reason for caution in such analyses is that we don't know which questions on the exam contribute to the Inorganic Chemistry subscore, and thus it is a little hard to attribute changes on exam performance to changes in a particular course.



Adjunct use

Table 9 on pages 28 - 31 lists courses taught over the last five years sorted by faculty status (full time vs. part time). Of the total enrollment, 65% of the students are taught by full time faculty. The program is very careful in selecting adjunct faculty, especially for courses in the major. We were fortunate to be able to find highly qualified faculty with a strong chemistry background; several faculty hold M.S. and Ph.D. degrees in chemistry or education.

Graduation/Retention Rates

See Graduation rates in Table 2 on page 21. Retention rates are extremely difficult to determine with the data provided. At this point we can postulate many exit points from the program other than graduation (for example: change of major, transfer to another institution, acceptance into professional school, dropping out). A detailed examination of the retention rate would require an analysis of each individual student's progress through the curriculum. Currently it is very laborious to get this information from the University and in some cases the information is simply not available (For example, we may not be able to determine if a student transferred or dropped out. All we know is that they did not register for classes in a given semester.)

However, due to the faculty's emphasis of putting our students first by spending a lot of time with advising and fostering individual students, we were able to observe that our students often decide to major in chemistry only after achieving success in several chemistry courses. At the same time, many students who come in thinking they will major in chemistry realize after seeing the rigor of the subject that they would prefer a different path. Thus the students who graduate are not the students who enter as chemistry majors. Once students declare a major and start 2nd year majors-level courses, they typically are retained and graduate.

Also, pre-professional students (especially students focused toward pharmacy or dentistry school) are accepted early into their respective professional programs and will show in the database as not being retained. Recently, we have noticed an increasing number of students completing their degree before matriculating to professional schools

Previous Program Review Results

The last program review was submitted during the spring of 2008; we did not receive a written summary of the review results. However, Dr. Gilberti, Dean of the College of Science and Technology, indicated (phone conversation on 1/31/2013) that the only program review result was the requirement to increase the number of chemistry majors in the program.

As indicated earlier in this review, chemistry majors during the fall and spring semesters of the academic years of 2007 – 2012 averaged 37 students. The minimum number (29) occurred in spring 2008 and the maximum in the spring of 2012 (48) (Refer to Table **I** on page 21). This corresponds to an increase by 66 % in the chemistry program during the time frame of this report while enrollment at FSU decreased by -2.1 % (total headcounts) or -0.4 % (FTE) (2008-2012 data; "Final Enrollment Data for Fall 2012", West Virginia Higher Education Policy Commission, last access on 1/3/12, https://www.wvhepc.org/news/News_Releases/Final_Enrollment_Data_for_Fall_2012.pdf).

We attribute the observed increase in chemistry majors to an increased flexibility in course sequencing and an increased interest in chemistry from the pre-professional students. Our program undertook a major curriculum revision with the advent of new ACS curriculum guidelines, and with input from our Dean, our Provost and our Advisory Board. One substantive goal was to attract more chemistry majors from our large pre-professional population by making the first year obviously relevant to their biochemical interests. We also were excited about the opportunity to let students take different paths through the program. We have lost students in the past because there were so many stacked courses to take and they didn't realize they were interested in chemistry until their second or third year in college. The new curriculum is formally in place for the 2012-13 academic year, though we began the transition in the past two years.

ADEQUACY (§ 4.2.4.2)

Program Requirements:			
	Allowed Range	Chemistry Program	Comments
General Studies	32 – 42 hours	33 hours	See Compliance with Degree Definition Policy – Appendix III, on page 47
Major	32 – 65 hours	61-63 hours	
Electives	Minimum 21 hours	32-34 hours	
TOTAL	Maximum 128 hours	128 hours	
Programs not meeting the above requirements must request a continuation of their exception with a justification below:			

Faculty Data

Courses taught by full time faculty are summarized in Table 10 on pages 32 - 36.

Full Time Faculty Data sheets are attached in Appendix II, on pages 37 – 46.

Several departmental faculty members are actively engaged in the scholarship of teaching, including National Science Foundation-supported development of teaching materials and innovative teaching strategies such as outcome-based learning and intercollegiate online learning communities. Program faculty are campus leaders in the use of Blackboard course management system for enhancing regular course delivery and the major portion of our program is accessible online through Blackboard. Program faculty are committed to educating secondary science teachers and consciously model best practices and alternative strategies for science instruction, including active learning, continuous assessment, group activities, problem-solving, on-line course enhancements, presentations, and discussions.

Chemistry faculty continuously update their knowledge in the field by attending workshops, conferences and lectures, and by reading the literature and applying new concepts to teaching. In addition to keeping abreast of developments in their fields, the chemistry faculty members are constantly striving to improve teaching effectiveness by supplementing material in current textbooks, using alternatives to lecture, and frequently changing textbooks and exploring electronic textbooks and learning options to gain new coverage.

The chemistry faculty also are active in professional service, serving as judges for the North

Central West Virginia Science, Energy and Engineering Fair, offering activities at the Science and Engineering Challenge, and acting as moderators for the RESA Science Bowl Contest. The department has organized visits to local schools, and individual faculty members also present workshops and give talks for K-12 teachers and students and for homeschoolers and serve as science instructors and/or project directors for summer science camps for middle school students. Departmental faculty members are involved as officers and program chairs in the North Central West Virginia section of the American Chemical Society and other professional organizations.

Accreditation / national standards

The B.S. in Chemistry has been nationally certified by the American Chemical Society since Fall, 2009 and provides a well-balanced program of courses in the major fields of chemistry, as well as mathematics and physics. A student completing this program will be a competitive candidate for graduate study or positions in industry or government agencies.

The guidelines from the ACS (Spring 2008) specify: "The American Chemical Society (ACS) promotes excellence in chemistry education for undergraduate students through approval of baccalaureate chemistry programs. [...] Approved programs offer their students a broad-based and rigorous chemistry education that provides them with the intellectual, experimental, and communication skills to participate effectively as scientific professionals. Offering such a rigorous program requires an energetic and accomplished faculty, a modern and well-maintained infrastructure, and a coherent chemistry curriculum that incorporates modern pedagogical approaches."

In this context, the chemistry program is realizing that to continue to meet the ACS guidelines we need to strengthen our infrastructure by

- improving fume hood adequacy
- replacing an aging chemical storage facility
- replacing and updating instrumentation
- ensuring continued access to ACS-specified journals

NECESSITY (§ 4.1.3.3)

Placement – Similar Programs in WV

Other institutions of higher education within 50 miles that offer a similar degree include West Virginia Wesleyan College, Alderson-Broaddus College, David and Elkins College, Glenville State College and West Virginia University. The first three are private; consequently, many West Virginia students, both traditional and non-traditional, cannot afford them. In addition, only WVU and FSU offer chemistry degrees approved by the American Chemical Society. WVU is the state's largest public supported institution. Thus the chemistry degree

program at Fairmont State University is the only one in North Central West Virginia that is affordable, regularly-offered, ACS-approved and provided in a small college atmosphere.

Tracking of graduates is summarized in Table 6 on page 25.

CONSISTENCY WITH MISSION (§ 4.1.3.4)

Explain how this program fits into the mission of the institution. Identify the relationship of this program to other programs at the institution, especially in terms of mutual support (e.g., shared faculty, shared facilities, shared course requirements for external program accreditation).

Fairmont State University Mission Statement: The Mission of Fairmont State University is to provide opportunities for individuals to achieve their professional and personal goals and discover roles for responsible citizenship that promote the common good.

Fairmont State University Vision Statement: Fairmont State University aspires to be nationally recognized as a model for accessible learner-centered institutions that promote student success by providing comprehensive education and excellent teaching, flexible learning environments, and superior services. Graduates will have the knowledge, skills, and habits of mind necessary for intellectual growth, full and participatory citizenship, employability, and entrepreneurship in a changing environment.

College of Science and Technology Mission is to promote effective student learning in science, math and technology and to prepare top-quality graduates for their future endeavors, including graduate study, employment or other personal goals.

Chemistry Program Mission:

The mission of the Chemistry Program at Fairmont State is to help students gain a fundamental knowledge of modern chemistry, including the ability to apply computers, mathematics, biology and physics to the field. We expect and encourage our students to develop the analytical and problem-solving skills necessary to successfully pursue science-based careers. Another integral part of our mission is to foster excellent oral and written skills, including high tech communication abilities.

The chemistry program supports several important aspects of the mission and vision of Fairmont State University and the College of Science and Technology. The university maintains a strong baccalaureate program in which the Bachelor of Science degree in chemistry has historically played, and continues to play an important role. The chemistry program produces broadly educated graduates who have served the immediate region, the state and the nation in a variety of professional roles; e.g., Ph.D., M.S., and B.S., chemists, physicians, lawyers, etc. The program offers a variety of chemistry courses to help fulfill a need for scientifically educated professionals in scientific and non-scientific disciplines. Our chemistry teaching specialization supports the historically strong program in secondary education at Fairmont State University. The chemistry minor and the biotechnology area of emphasis both provide strong chemistry backgrounds for students pursuing other majors.

The chemistry program has adopted a highly learner-centered curriculum, with all courses structured around explicitly defined student learning outcomes. Our use of extensive online support, group work, formal and informal peer tutoring, and hands-on activities in our courses increases flexibility and supportiveness of learning environments. Most of the chemistry faculty are actively involved as mentors for student scholarship and research, and faculty/student teams travel regularly to professional conferences and talks. Our students and graduates are high achievers, and demonstrate a strong desire to give back, both to Fairmont State and to their communities.

The chemistry faculty, staff, students, facilities, and equipment are constantly interacting with other programs in the College of Science and Technology and in other schools; e.g. forensics, biology, physics, science education, mathematics, nursing, medical laboratory technology, medical records technology, veterinary technology, physical therapy assisting, airway science technology, civil engineering technology, occupational safety, pre-professional studies (including pre-medicine, pre-pharmacy, pre-dental, pre-physical therapy, pre-engineering, pre-medical technology) and many others.

Student clubs (for example Students Taking Action in Natures Defense (STAND) and the American Chemical Society Student Affiliates Club) are advised by chemistry program faculty. The American Chemical Society Student Affiliates Club has traveled to high schools in the local area to conduct chemical demonstrations in their classrooms. These demonstrations have a two-fold purpose; not only do the high school students get interested in chemistry, they also get to meet our wonderful students who are our best ambassadors to the community.

Appendix I: Data Tables

Table 1 Chemistry Program Majors – Number by Term						
Primary Major	Term	Freshman	Sophomore	Junior	Senior	Total
Chemistry	Fall Semester 2007	8	5	4	13	30
	Spring Semester 2008	4	9	3	13	29
	Summer Semester 2008	1	2		1	4
	Fall Semester 2008	8	8	7	13	36
	Spring Semester 2009	2	8	8	18	36
	Summer Semester 2009	1	2	1	3	7
	Fall Semester 2009	4	7	4	15	30
	Spring Semester 2010	3	6	5	16	30
	Summer Semester 2010		1	2	2	5
	Fall Semester 2010	8	9	6	20	43
	Spring Semester 2011	5	5	8	23	41
	Summer Semester 2011			4	3	7
	Fall Semester 2011	9	7	10	21	47
	Spring Semester 2012	8	7	10	23	48
	Summer Semester 2012	3	4	1	4	12
Education With Chemistry Certification	Fall Semester 2007				1	1
	Spring Semester 2008				2	2
	Fall Semester 2008				1	1
	Spring Semester 2009				1	1
	Fall Semester 2009				2	2
	Spring Semester 2010				2	2
	Summer Semester 2010		1		1	2
	Fall Semester 2010		1		1	2
	Spring Semester 2011		1		1	2
	Summer Semester 2011		2			2
	Fall Semester 2011		3	1	1	5
	Spring Semester 2012		1	2	2	5
	Summer Semester 2012				1	1

Table 2 Chemistry Graduates – Number by Year			
Academic Year	Chemistry	Education with Chemistry Certification	Grand Total
2008	6		6
2009	4	1	5
2010	2	1	3
2011	4		4
2012	11		11
Grand Total	27	2	29

Table 3
Chemistry Program Total Course Enrollments

		2007-2008		2008-2009		2009-2010		2010-2011		2011-2012		
Course Number	Course Title	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Grand Total
1105	Chemical Principles I	167		101		83		105		96		552
	Chemical Principles I-Honors					17		22		19		58
1106	Chemical Principles II		55		72		56		114		75	372
1113	Pract Sci Stats Sprdsht-Online		52		74		53					179
2201	Organic Chemistry I	25		25		62		37		41		190
2202	Organic Chemistry II		20		22		20		25		27	114
2205	Analytical Chemistry	16		16		16		14		17	8	87
2215	Instrumental Analysis		10		7		14		8			39
3301	Physical Chemistry I	5		7		8		11		20		51
3302	Physical Chemistry II								12		12	24
	Physical Chemistry II-Online		4		5		7					16
4401	Independent Study		1					2	4	16	19	42
4403	Independent Study/Research					2		2				4
4405	Advanced Integrated Lab	9	28	18	14	22	16	38	14			159
4450	Advanced Inorganic Chemistry	4		3		2		7		16	19	51
4455	Advances in Modern Chemistry				10				16			26
4998	Undergraduate Research				2						1	3
	Undergraduate Research-Hon									1	1	2
Grand Total		226	170	170	206	212	166	238	193	226	162	1969

Notes:
All courses taught on Fairmont Campus. Numbers may be inaccurate in some cases due to double counting of team-taught sections in Banner.

Table 4
Service Course Total Enrollments

		2007-2008			2008-2009			2009-2010			2010-2011			2011-2012			
Course Number	Course Title	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Grand Total
1101	General Chemistry I	204	142	46	222	125	31	222	121	42	239	120	39	225	122	25	1925
	General Chemistry I-Honors								1								1
1102	General Chemistry II		61	26		80	30		61	31		60	23		63	20	455
2225	Forensic Microscopy		2					4							13		19
Grand Total		204	205	72	222	205	61	226	183	73	239	180	62	225	198	45	2400

Notes:
Academic Terms: Fa= fall; Sp = spring; Su = summer

Includes on and off campus courses

Includes courses taught by full and part time instructors

Table 5
Service Course Success Rates

Course		2007-2008			2008-2009			2009-2010			2010-2011			2011-2012			Total
Num	Title	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	
1101	General Chemistry I	68	64	94	74	71	97	74	77	76	72	65	76	71	80	88	73
	General Chemistry I-Honors								100								100
1102	General Chemistry II		61	91		78	88		72	91		78	100		79	95	80
2225	Forensic Microscopy		100					100							92		95

Notes:
Academic Terms: Fa = Fall; Sp = Spring; Su = Summer
Expressed as the percent of students receiving a grade of A, B, C, or AU (audit)

Table 6
Chemistry Program Graduates

Graduation Year	Name		FSU ID	Degree	Current Status
2008				BS	Pierpont Community and Technical College Faculty
2008				BS	Chemist at REIC
2008				BS	Mylan
2008				BS	WVU Chemistry Graduate School
2008				BS	Graduate School in Japan
2008				BS	Adjunct Professor FSU
2009				BA Education	East Fairmont High School
2009				BS	Mylan
2009				BS	Mylan
2009				BS	Reliance Laboratories
2009				BS	Graduate School
2010				BS	WVU Chemistry Graduate School
2010				BA Education	Department of Energy
2010				BS	Master of Arts Teaching at FSU
2011				BS	Mylan
2011				BS	Mylan
2011				BS	PPG
2011				BS	MSES Consultants
2012				BS	Reliance Laboratories
2012				BS	Lab Corp
2012				BS	Plextronics
2012				BS	Applying to Med School
2012				BS	Department of Energy
2012				BS	EQT
2012				BS	Teaching Assistant FSU
2012				BS	Microtel Inn & Suites
2012				BS	Dental School
2012				BS	Unemployed (Expanding search outside Morgantown)
2012				BS	Mylan

Table 7
On Campus and off Campus Course Enrollment

Campus	Number	Course Title	Total
Fairmont	1101	General Chemistry I	1576
		General Chemistry I-Honors	1
	1102	General Chemistry II	455
	1105	Chemical Principles I	552
		Chemical Principles I-Honors	58
	1106	Chemical Principles II	372
	2201	Organic Chemistry I	190
	2202	Organic Chemistry II	114
	2205	Analytical Chemistry	87
	2215	Instrumental Analysis	39
	2225	Forensic Microscopy	19
	3301	Physical Chemistry I	51
	3302	Physical Chemistry II	24
	4401	Independent Study	42
	4403	Independent Study/Research	4
	4405	Advanced Integrated Lab	159
	4450	Advanced Inorganic Chemistry	51
	4455	Advances in Modern Chemistry	26
	4998	Undergraduate Research	3
		Undergraduate Research-Hon	2
Fairmont Total			3825
Virtual On-Line Campus	1113	Pract Sci Stats Sprdsht-Online	179
	3302	Physical Chemistry II-Online	16
Virtual On-Line Campus Total			195
Caperton Center - Clarksburg	1101	General Chemistry I	16
High School Dual Enrollment	1101	General Chemistry I	81
Lewis County	1101	General Chemistry I	95
Monongalia County	1101	General Chemistry I	146
Randolph County	1101	General Chemistry I	11
Off Campus Total			349

Table 8

Chemistry Program Goals, Direct Measures and Performance Standards

B. S. in Chemistry - Program Outcomes *Upon successful completion of this program, students will be able to:*	**Direct assessment measure** *Student performance with respect to this outcome will be measured by:*
1. Demonstrate competency in the laboratory skills expected of a practicing chemist.	Specified outcomes in a. Chem 3301 (Physical Chemistry I) b. Chem 3315 (Instrumental Analysis) c. Chem 4404 (Synthetic Methods and Materials) d. Chem 4412 (Physical Chemistry II)
2. Demonstrate foundational knowledge needed by chemical professionals.	Performance on ETS tests and ACS standardized exams
3. Solve chemistry problems using mathematical and computational tools.	Performance on selected projects: a. CHEM 2205 Nonlinear least squares fit to titration curve b. CHEM 4412 Computational Chemistry: Rotational spectrum of anions found in space
4. Apply foundational knowledge to analyze complex problems.	Performance on selected projects: a. Chem 4404 Green Chemistry Challenge b. Chem 4412. Analysis of HCl-DCl spectrum
5. Competently access, evaluate and learn new chemical information and skills.	Performance on selected projects: a. Chem 4404 STN project (access and evaluate new information) b. CHEM 3315 Instrumental Analysis. Determining pH from Beer's Law (learn new information)
6. Identify the relationships between chemistry and other disciplines, and the applications of chemistry in society.	Performance on selected projects in CHEM 3301: a. Open-ended modeling project b. Stratospheric Ozone Kinetics modeling
7. Speak, write and listen critically.	Performance on selected projects: a. Students present an instrumental technique in CHEM 3315 b. Students prepare and present a poster in CHEM 4404 c. Students write a lab report on an open-ended laboratory project in CHEM 3301 d. Students critique archived derivation presentations in CHEM 4412

Table 9
Enrollments in Courses Taught by Full and Part Time Faculty

		Course		
Faculty Class	Name	Numb	Title	Enrollment
12 Month Faculty Administrator	Gilberti, Anthony	4998	Undergraduate Research	1
	Gilberti, Anthony Total			1
12 Month Faculty Administrator Total				1
9, 10, or 11 Month Faculty	Baur, Andreas	1101	General Chemistry I	94
			General Chemistry I Lab	19
		1106	Chem Principles II Test Lab	52
			Chemical Principles II	68
		2201	Organic Chemistry I	134
			Organic Chemistry I Lab	94
			Organic Chemistry I Test Lab	133
		2202	Organic Chemistry II	94
			Organic Chemistry II Lab	85
			Organic Chemistry II Test Lab	94
		4401	Independent Study	31
		4405	Advanced Integrated Lab	28
		4450	Advanced Inorganic Chemistry	19
	Baur, Andreas Total			945
	Baxter, Harry	1101	General Chemistry I	597
			General Chemistry I Lab	240
		1102	General Chemistry II	103
			General Chemistry II Lab	168
		1105	Chemical Principles I Lab	14
		1113	Pract Sci Stats Sprdsht-Online	25
		2201	Organic Chemistry I	25
			Organic Chemistry I Lab	20
			Organic Chemistry I Test Lab	25
		2202	Organic Chemistry II	20
			Organic Chemistry II Lab	20
			Organic Chemistry II Test Lab	20
		4401	Independent Study	1
		4405	Advanced Integrated Lab	53
		4455	Advances in Modern Chemistry	5
	Baxter, Harry Total			1336
	Harvey, Erica	1105	Chemical Principles I	230
			Chemical Principles I-Honors	58
		1106	Chem Principles II Test Lab	157
			Chemical Principles II	111
		3301	Physical Chemistry I	41
		3302	Physical Chemistry II	18

		Physical Chemistry II-Online	16
	4405	Advanced Integrated Lab	30
	4450	Advanced Inorganic Chemistry	19
Harvey, Erica Total			680
Roof, Steven	1106	Chemical Principles II	32
	4998	Undergraduate Research	2
Roof, Steven Total			34
Scanlon, Matthew	1101	General Chemistry I	114
		General Chemistry I Lab	21
	1102	General Chemistry II	26
		General Chemistry II Lab	18
	1105	Chemical Principles I	264
		Chemical Principles I Lab	31
	1106	Chem Principles II Test Lab	108
		Chemical Principles II	161
		Chemical Principles II Lab	5
	1113	Pract Sci Stats Sprdsht-Online	53
	2205	Analytical Chemistry	87
		Analytical Chemistry Lab	71
		Analytical Chemistry Test Lab	87
	2215	Instrumental Analysis	39
		Instrumental Analysis Lab	39
	3301	Physical Chemistry I	10
	3302	Physical Chemistry II	6
	4401	Independent Study	4
	4403	Independent Study/Research	1
	4405	Advanced Integrated Lab	48
	4450	Advanced Inorganic Chemistry	13
	4455	Advances in Modern Chemistry	21
	4998	Undergraduate Research-Hon	1
Scanlon, Matthew Total			1228
Weekley, James	1101	General Chemistry I	41
		General Chemistry I Lab	22
		General Chemistry I-Honors	1
	1102	General Chemistry II	104
	1105	Chemical Principles I	58
		Chemical Principles I Lab	347
	1106	Chemical Principles II Lab	249
	1113	Pract Sci Stats Sprdsht-Online	101
	2201	Organic Chemistry I Lab	5
	2205	Analytical Chemistry Lab	16
	2225	Forensic Microscopy	19
	4401	Independent Study	6
	4403	Independent Study/Research	3
	4998	Undergraduate Research-Hon	1
Weekley, James Total			973

9, 10, or 11 Month Faculty Total				**5196**
Full Time Classified Salaried	Hurst, Kathleen	1101	General Chemistry I Lab	343
		1102	General Chemistry II Lab	42
	Hurst, Kathleen Total			385
Full Time Classified Salaried Total				**385**
Full Time Nonclassified Salary	Bradley, Daniel	1105	Chemical Principles I Lab	15
	Bradley, Daniel Total			15
Full Time Nonclassified Salary Total				**15**
PT Faculty	Baur, Alexandr	2201	Organic Chemistry I Lab	21
		2202	Organic Chemistry II Lab	8
	Baur, Alexandr Total			29
	Cattafesta, Deborah	1101	General Chemistry I Lab	41
		1102	General Chemistry II Lab	42
		1105	Chemical Principles I Lab	60
	Cattafesta, Deborah Total			143
	Gear, Charles	1101	General Chemistry I General Chemistry I Lab	103 103
	Gear, Charles Total			206
	Lewis, Brian	1101	General Chemistry I General Chemistry I Lab	113 165
		1102	General Chemistry II Lab	40
	Lewis, Brian Total			318
	Lynch, John	1101	General Chemistry I General Chemistry I Lab	105 105
	Lynch, John Total			210
	McDaniel, Robert	1101	General Chemistry I General Chemistry I Lab	125 122
	McDaniel, Robert Total			247
	Sampson, Madeline	1101	General Chemistry I General Chemistry I Lab	225 124
		1102	General Chemistry II General Chemistry II Lab	222 15
		1105	Chemical Principles I Lab	83
		1106	Chemical Principles II Lab	51

	Sampson, Madeline **Total**			720
	Schneider, Joetta	1101	General Chemistry I	297
			General Chemistry I Lab	254
	Schneider, Joetta **Total**			551
	Thompson, Lyvon	2201	Organic Chemistry I	31
			Organic Chemistry I Lab	19
	Thompson, Lyvon **Total**			50
	Williams, Jackie	1101	General Chemistry I	111
			General Chemistry I Lab	179
	Williams, Jackie **Total**			290
	Woofter, Jana	1106	Chemical Principles II Lab	15
	Woofter, Jana **Total**			15
PT Faculty Total				**2779**
Temporary Appt - Salaried	Debolt, Holly	1105	Chemical Principles I Lab	31
		2201	Organic Chemistry I Lab	12
	Debolt, Holly Total			43
Temporary Appt - Salaried Total				**43**

Table 10
Courses Taught by Full Time Faculty – By Term

		Course		
Instructor	Term	Number	Title	Enrollment
Baur, Andreas	200820	1101	General Chemistry I Lab	19
		1106	Chemical Principles II	28
		4405	Advanced Integrated Lab	14
	200830	1101	General Chemistry I	36
	200910	2201	Organic Chemistry I	25
			Organic Chemistry I Lab	25
			Organic Chemistry I Test Lab	25
		4450	Advanced Inorganic Chemistry	3
	200920	1106	Chem Principles II Test Lab	52
			Chemical Principles II	20
		2202	Organic Chemistry II	22
			Organic Chemistry II Lab	21
			Organic Chemistry II Test Lab	22
		4405	Advanced Integrated Lab	14
	201010	2201	Organic Chemistry I	31
			Organic Chemistry I Lab	12
			Organic Chemistry I Test Lab	31
	201020	2202	Organic Chemistry II	20
			Organic Chemistry II Lab	20
			Organic Chemistry II Test Lab	20
	201030	1101	General Chemistry I	42
	201110	2201	Organic Chemistry I	37
			Organic Chemistry I Lab	37
			Organic Chemistry I Test Lab	36
	201120	1106	Chemical Principles II	20
		2202	Organic Chemistry II	25
			Organic Chemistry II Lab	25
			Organic Chemistry II Test Lab	25
	201130	1101	General Chemistry I	16
	201210	2201	Organic Chemistry I	41
			Organic Chemistry I Lab	20
			Organic Chemistry I Test Lab	41
		4401	Independent Study	14
		4450	Advanced Inorganic Chemistry	16
	201220	2202	Organic Chemistry II	27
			Organic Chemistry II Lab	19
			Organic Chemistry II Test Lab	27
		4401	Independent Study	17
Baxter, Harry	200810	1101	General Chemistry I	40
		1105	Chemical Principles I Lab	14
		2201	Organic Chemistry I	25
			Organic Chemistry I Lab	20
			Organic Chemistry I Test Lab	25

	200820	1102	General Chemistry II	31
			General Chemistry II Lab	20
		2202	Organic Chemistry II	20
			Organic Chemistry II Lab	20
			Organic Chemistry II Test Lab	20
	200910	1101	General Chemistry I	89
			General Chemistry I Lab	39
		4405	Advanced Integrated Lab	9
	200920	1101	General Chemistry I	36
			General Chemistry I Lab	20
		1102	General Chemistry II	39
			General Chemistry II Lab	21
		1113	Pract Sci Stats Sprdsht-Online	25
		4455	Advances in Modern Chemistry	5
	201010	1101	General Chemistry I	90
			General Chemistry I Lab	39
		4405	Advanced Integrated Lab	11
	201020	1101	General Chemistry I	31
			General Chemistry I Lab	20
		1102	General Chemistry II	33
			General Chemistry II Lab	46
	201110	1101	General Chemistry I	93
			General Chemistry I Lab	41
		4405	Advanced Integrated Lab	19
	201120	1101	General Chemistry I	65
		1102	General Chemistry II Lab	39
		4401	Independent Study	1
		4405	Advanced Integrated Lab	14
	201210	1101	General Chemistry I	85
			General Chemistry I Lab	59
	201220	1101	General Chemistry I	68
			General Chemistry I Lab	22
		1102	General Chemistry II Lab	42
Harvey, Erica	200810	1105	Chemical Principles I	51
		3301	Physical Chemistry I	5
	200820	3302	Physical Chemistry II-Online	4
		4405	Advanced Integrated Lab	14
	200910	1105	Chemical Principles I	51
		3301	Physical Chemistry I	7
	200920	3302	Physical Chemistry II-Online	5
	201010	1105	Chemical Principles I	37
			Chemical Principles I-Honors	17
		3301	Physical Chemistry I	8
	201020	3302	Physical Chemistry II-Online	7
		4405	Advanced Integrated Lab	16
	201110	1105	Chemical Principles I	35
			Chemical Principles I-Honors	22
		3301	Physical Chemistry I	11

	201120	1106	Chem Principles II Test Lab	82
			Chemical Principles II	62
		3302	Physical Chemistry II	12
	201210	1105	Chemical Principles I	56
			Chemical Principles I-Honors	19
		3301	Physical Chemistry I	10
	201220	1106	Chem Principles II Test Lab	75
			Chemical Principles II	49
		3302	Physical Chemistry II	6
		4450	Advanced Inorganic Chemistry	19
Roof, Steven	200920	4998	Undergraduate Research	2
	201120	1106	Chemical Principles II	32
Scanlon, Matthew	200810	1105	Chemical Principles I	58
		2205	Analytical Chemistry	16
			Analytical Chemistry Test Lab	16
		4405	Advanced Integrated Lab	9
		4450	Advanced Inorganic Chemistry	4
	200820	1101	General Chemistry I	35
		1102	General Chemistry II Lab	18
		1106	Chemical Principles II	27
		2215	Instrumental Analysis	10
			Instrumental Analysis Lab	10
	200830	1102	General Chemistry II	26
	200910	1105	Chemical Principles I	50
			Chemical Principles I Lab	15
		2205	Analytical Chemistry	16
			Analytical Chemistry Lab	16
			Analytical Chemistry Test Lab	16
		4405	Advanced Integrated Lab	9
	200920	1106	Chem Principles II Test Lab	52
			Chemical Principles II	52
		2215	Instrumental Analysis	7
			Instrumental Analysis Lab	7
		4455	Advances in Modern Chemistry	5
	200930	1101	General Chemistry I	31
	201010	1105	Chemical Principles I	46
			Chemical Principles I Lab	16
		2205	Analytical Chemistry	16
			Analytical Chemistry Lab	16
			Analytical Chemistry Test Lab	16
		4405	Advanced Integrated Lab	11
		4450	Advanced Inorganic Chemistry	2
	201020	1106	Chem Principles II Test Lab	56
			Chemical Principles II	56
		1113	Pract Sci Stats Sprdsht-Online	53
		2215	Instrumental Analysis	14
			Instrumental Analysis Lab	14

	201110	1105	Chemical Principles I	70
		2205	Analytical Chemistry	14
			Analytical Chemistry Lab	14
			Analytical Chemistry Test Lab	14
		4401	Independent Study	1
		4403	Independent Study/Research	1
		4405	Advanced Integrated Lab	19
		4450	Advanced Inorganic Chemistry	7
	201120	1101	General Chemistry I Lab	21
		2215	Instrumental Analysis	8
			Instrumental Analysis Lab	8
		4401	Independent Study	3
		4455	Advances in Modern Chemistry	16
	201130	1101	General Chemistry I	23
	201210	1105	Chemical Principles I	40
		2205	Analytical Chemistry	17
			Analytical Chemistry Lab	17
			Analytical Chemistry Test Lab	17
		3301	Physical Chemistry I	10
		4401	Independent Study	0
		4998	Undergraduate Research-Hon	1
	201220	1106	Chemical Principles II	26
			Chemical Principles II Lab	5
		2205	Analytical Chemistry	8
			Analytical Chemistry Lab	8
			Analytical Chemistry Test Lab	8
		3302	Physical Chemistry II	6
	201230	1101	General Chemistry I	25
Weekley, James	200810	1105	Chemical Principles I	58
			Chemical Principles I Lab	50
		2201	Organic Chemistry I Lab	5
		2205	Analytical Chemistry Lab	16
	200820	1106	Chemical Principles II Lab	43
		1113	Pract Sci Stats Sprdsht-Online	52
		2225	Forensic Microscopy	2
		4401	Independent Study	1
	200830	1101	General Chemistry I	10
	200910	1105	Chemical Principles I Lab	74
	200920	1101	General Chemistry I Lab	22
		1106	Chemical Principles II Lab	52
		1113	Pract Sci Stats Sprdsht-Online	49
	200930	1102	General Chemistry II	30
	201010	1105	Chemical Principles I Lab	71
		2225	Forensic Microscopy	4
		4403	Independent Study/Research	2
	201020	1101	General Chemistry I	31
			General Chemistry I-Honors	1
		1106	Chemical Principles II Lab	56

	201030	1102	General Chemistry II	31
	201110	1105	Chemical Principles I Lab	79
		4401	Independent Study	1
		4403	Independent Study/Research	1
	201120	1106	Chemical Principles II Lab	67
	201130	1102	General Chemistry II	23
	201210	1105	Chemical Principles I Lab	73
		4401	Independent Study	2
	201220	1106	Chemical Principles II Lab	31
		2225	Forensic Microscopy	13
		4401	Independent Study	2
		4998	Undergraduate Research-Hon	1
	201230	1102	General Chemistry II	20

Appendix II: Faculty Data

Name : _Andreas Baur_____Rank: Professor _____

Check One: Full-time__x___ Part-time _____ Adjunct _____ Graduate Asst. _____

Highest Degree Earned _Dr. rer. nat.___ Date Degree Received ___1997 _____

Conferred by ___Universität Regensburg (Germany) _____

Area of Specialization ___Organic Chemistry _____

Professional registration/licensure _NA__ Yrs. of employment at present institution __12_____
Years of employment in higher education __14___ Yrs. of related experience outside higher education __1____
Non-teaching experience _____
To determine compatibility of credentials with assignment:

(a) List courses you taught this year and those you taught last year: (If you participated in team-taught course, indicate each of them and what percent of courses you taught.) For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number & Title	Enrollment
2011/2012, Fall 2011	Chem 2201/Organic Chemistry I	41
	Chem 2201/Organic Chemistry I laboratory	10
	Chem 2201/Organic Chemistry I laboratory	10
	Chem 4450/Advanced Inorganic Chemistry	16
	Chem 4450/Advanced Inorganic Chemistry laboratory	16
2011/2012, Spring 2012	Chem 2202/Organic Chemistry II	27
	Chem 2202/Organic Chemistry II laboratory	10
	Chem 2202/Organic Chemistry II laboratory	9
	Biol 3360/Biochemistry	26
	Chem 4450/Advanced Inorganic Chemistry laboratory	18
2010/2011, Fall 2010	Chem 2201/Organic Chemistry I	37
	Chem 2201/Organic Chemistry I laboratory	12
	Chem 2201/Organic Chemistry I laboratory	12
	Chem 2201/Organic Chemistry I laboratory	7
	Chem 2201/Organic Chemistry I laboratory	6
2010/2011, Spring 2011	Chem 2202/Organic Chemistry II	25
	Chem 2202/Organic Chemistry II	10

	laboratory	
	Chem 2202/Organic Chemistry II laboratory	6
	Chem 2202/Organic Chemistry II laboratory	9
	Chem 1106, Chemical Principles II	20
2010/2011, Summer 2011	Chem 1101, General Chemistry I	16

(b) If degree is not in area of current assignment, explain. **N/A**

(c) Identify your professional development activities during the past five years.
Attended Professional Conferences:
National Meeting of the American Chemical Society, Washington, DC, **August 2009**
20th Biennial Conference on Chemical Education, Bloomington, IN, **July 2008**
National Meeting of the American Chemical Society, Boston, MA, **August 2007**

(d) List awards/honors (including invitations to speak in your area of expertise) or special recognition In last five years. **N/A**
Invitation from Learning Options, Inc. to conduct a science workshop for students ranging from 9 – 15 years old; Spring 2012

(e) Indicate any other activities which have contributed to effective teaching.
Workshops:
Vista 4.0 Intensive (**2007**), USB Live (**2007**), StudyMate/Flash (**2007**), Camtasia (**2007**), Accessibility (**2007**)

Research projects:
"Metal complexes of tetrathiafulvalenes and tetrathiafulvalene derivatives as organic-inorganic hybrid precursors for conducting and magnetic materials." (**2008/2009**)

"Investigating the biochemical effects on homocysteine on stromal and endothelial cells" in collaboration with Dr. Sarah Dodson and Dr. Mark Flood (**2007/2008**)

"Data mining of course assessment mastery data" in collaboration with Dr. Mahmood Hossain and Dr. Erica Harvey (**2007/08**)

(f) List professional books/papers published during the last five years.

Presentations:
Andreas Baur, Erica Harvey "Completing the Cycle: Using Outcome Mastery Data for Course Improvement", 20th Biennial Conference on Chemical Education, Bloomington, IN, July **2008**

William Green, Andreas Baur "Synthesis of Precursors for Redox-active Imino Ligands", 2009 National Meeting of the American Chemical Society, Washington, DC, August **2009**

(g) List externally funded research (grants and contracts) during last five years.
2008 Research Funding Development Grant

2009 NASA SURE Grant

Faculty Data

Name: Harry N. Baxter, III Rank: Professor of Chemistry

Check One
Full-time: X Part-time: Adjunct: Graduate Asst.

Highest Degree Earned: PhD Date Degree Received: 5/1985

Conferred by: The Pennsylvania State University

Area of Specialization: Organic Chemistry Professional registration/licensure:

Yrs. of employment at present institution 27 Years of employment in higher education 27

Yrs. of related experience outside higher education: 0 Non-teaching experience 0

To determine compatibility of credentials with assignment:
(a) List courses you taught this year and those you taught last year: (If you participated in team-taught course, indicate each of them and what percent of courses you taught.) For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number & Title	Enrollment
2012/Spring	CHEM 1101 General Chemistry I (2 sections)	68
2012/Spring	CHEM 1101 General Chemistry I Lab	22
2012/Spring	CHEM 1102 General Chemistry II Lab (2 sections)	42
2011/Fall	CHEM 1101 General Chemistry I (2 sections)	85
2011/Fall	CHEM 1101 General Chemistry I Lab (3 sections)	59
2011/Spring	CHEM 1101 General Chemistry I (2 sections)	65
2011/Spring	CHEM 1102 General Chemistry II Lab (2 sections)	39
2011/Spring	CHEM 4401 Independent Study	1
2011/Spring	CHEM 4405 Advanced Integrated Lab	7
2010/Fall	CHEM 1101 General Chemistry I (2 sections)	91
2010/Fall	CHEM 1101 General Chemistry I Lab (2 sections)	41
2010/Fall	CHEM 4405 Advanced Integrated Lab	19

(b) If degree is not in area of current assignment, explain.

Identify your professional development activities during the past five years.

236th American Chemical Society National Meeting August 17-19, 2008
237th American Chemical Society National Meeting March 22-24, 2009
239th American Chemical Society National Meeting March 21-24, 2010
241st American Chemical Society National Meeting March 27-30, 2011
243rd American Chemical Society National Meeting March 25-28, 2012

List awards/honors (including invitations to speak in your area of expertise) or special recognition in last five years.

none

Indicate any other activities which have contributed to effective teaching.

none

List professional books/papers published during the last five years.

none

List externally funded research (grants and contracts) during last five years.

none

Faculty Data

Name : _Erica Harvey_____Rank: Professor _____
Check One: Full-time__x___ Part-time _____ Adjunct _____ Graduate Asst. _____
Highest Degree Earned _Ph.D.___ Date Degree Received ___1990 _____
Conferred by ___California Institute of Technology _____
Area of Specialization ____Chemistry _____
Professional registration/licensure _NA__ Yrs. of employment at present institution __19____
Years of employment in higher education __24___ Yrs. of related experience outside higher education __0____
Non-teaching experience _____
To determine compatibility of credentials with assignment:

(b) List courses you taught this year and those you taught last year: (If you participated in team-taught course, indicate each of them and what percent of courses you taught.) For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number & Title	Enrollment
2011/2012, Fall 2011	Chem 1105/Chemical Principles I	28
	Chem 1105/Chemical Principles I (team taught with Matt Scanlon, 50%)	28
	Chem 1105/Chemical Principles I - Honors	19
	Chem 3301/Physical Chemistry I	10
2011/2012, Spring 2012	Chem 1106/Chemical Principles II	27
	Chem 1106/Chemical Principles II (team taught with Steve Roof 33%)	22
	Chem 3302/Physical Chemistry II	6
	Chem 4450/Advanced Inorganic Chemistry	19
2010/2011, Fall 2010	Chem 1105/Chemical Principles I	35
	Chem 1105/Chemical Principles I - Honors	22
	Chem 3301/Physical Chemistry I	11
2010/2011, Spring 2011	Chem 1106/Chemical Principles II	30
	Chem 1106/Chemical Principles II (team taught with Steve Roof, 33%)	32
	Chem 3302/Physical Chemistry II	12

(h) If degree is not in area of current assignment, explain. **N/A**

(i) Identify your professional development activities during the past five years.

- AAC&U General Studies Conference, Chicago, IL, **March 2011.**
- IUPUI Assessment Institutes 2010/2009, Indianapolis, IN, **October 2010 and 2009.**
- West Virginia Science Teachers Association Annual Conference, Glade Springs Resort, WV, **November 2009.**
- National Meeting of the American Chemical Society, Washington, DC, **August 2009**
- 20th Biennial Conference on Chemical Education, Bloomington, IN, **July 2008**
- National Meeting of the American Chemical Society, Boston, MA, **August 2007**

(j) List awards/honors (including invitations to speak in your area of expertise) or special recognition In last five years.

- Chair-Elect, North Central WV ACS Section, 2011-12
- Project manager for software implementation (TaskStream assessment/ MAP-Works retention) 2007-11
- Straight Award Nominee, 2007.
- ACS Award for Service to the North Central West Virginia Section, 2007.

(k) Indicate any other activities which have contributed to effective teaching.

(l) List professional books/papers published during the last five years.

- "JCE QBank: Physical Chemistry Question Database for Quantum Chemistry." Erica Harvey, Theresa Zielinski. J. Chem. Educ., 2010, 87 (9), pp 996–997. DOI: 10.1021/ed100458w. Collection of nearly 1000 closed-response questions for learning and assessment. Web pub/: July, 2010. http://pubs.acs.org/doi/full/10.1021/ed100458w

- "Improving pedagogy by analyzing relevance and dependency of course learning outcomes." T. Devine, M. Hossain, E. Harvey, and A. Baur. In Proceedings of KDD Workshop on Knowledge Discovery in Educational Data, August 21, 2011.
- "Yoga in Quantum Chemistry Class" written by contributing editor John Borchardt, published in Career Quest, "Managing the Modern Laboratory", Volume 8, Number 3 (See http://labmanagers.org/resources/mml/) 2008.

Presentations:

- "Scientific Approach to Environmental Awareness." Erica Harvey, Co-advisor for S.T.A.N.D. – Green Team, Environmental Awareness Panel Discussion, Fairmont, WV, April 19, 2011.
- "Developing an Academically Rigorous, Outcomes-Based General Studies Program." Erica Harvey, Ph.D., Tim Oxley, Ed.D., Angela Schwer, Ph.D., Dara Wexler, Ph.D. AAC&U General Studies Conference, Chicago, IL, March 4-6, 2011.
- "A Hierarchy of Freshman Retention: Spotlighting Three Levels." Erica Harvey, Mehgan Clark, UW Oshkosh; Sherry Woosley, Ball State University , IUPUI Assessment Institute 2010, Indianapolis, IN, October 26, 2010.
- "Software Support for General Studies Outcomes Assessment." Erica Harvey, Angela Schwer. IUPUI Assessment Institute 2010, Indianapolis, IN, October 26, 2010.
- "Lewis Structures - "90% Rules" for Ages 5 and Up," Erica Harvey, West Virginia Science Teachers Association Annual Conference, Glade Springs Resort, WV, November 20, 2009.
- "Rapid, Large-Scale Implementation of an Online Assessment Management System: How (and Why!)," Erica Harvey and Jack Phadungtin, 2009 Assessment Institute, IUPUI, Indianapolis, October 26, 2009.
- "Building a Technology-Supported Culture of Assessment: Software Readiness Considerations," Erica Harvey, Texas A&M University Assessment Conference, February 23, 2009.
- "Completing the cycle: Using outcome mastery data for course improvement," Erica Harvey, Andreas Baur, 20th Biennial Conference on Chemical Education, Indiana University, July 31, 2008.
- "Online Physics Teaching Specialization – An Update," Erica Harvey, Deb Hemler, Toni Lynne DeVore, West Virginia Science Teachers Association Annual Conference, Snowshoe Conference Center and Resort, WV, November 15, 2007.
- "Simultaneous assessment of students and courses through outcome mastery data," Holly Debolt, Andreas Baur and Erica Harvey, American Chemcial Society National Meeting, Boston, August 19, 2007.
- "Electronic Quizzes for Quantum Chemistry," Erica Harvey and Theresa Zielinski, Computers in Chemical Education, Past, Present and Future: Symposium, American Chemical Society National Meeting, Boston, August 21, 2007.
- " FSU Celebration of Student Scholarship, 2007 and 2008 with student collaborators as noted:
    - Waste Stream Cost Analysis: A Preliminary Report," Kylie Jones, Larisa Lynch, Christopher Warnick, Don Trisel
    - "Creation of a Java Applet for Illustrating Thermodynamic Efficiency," Robert Ball, John Richards,
    - "Combining the Disciplines of Chemistry and Computer Science to Demonstrate Fundamental Spectroscopy Concepts," Sam Tenney

(m) List externally funded research (grants and contracts) during last five years.

- Consultant/Developer for POGIL-PCL (NSF-Funded project) 2011-present, Collaboration with physical chemists nationwide to develop, test, and offer relevant, POGIL-based laboratory activities for physical chemistry students.
- "Chemical and Mechanical Properties of Thick Silicon-nitride Nanotubes," Josh Walton, Erica Harvey, Martina Bachlechner, SURE (Summer Undergraduate Research Experience) program, **2011.** Funded for $3800.
- West Virginia Department of Environmental Protection Recycling Assistance Grant (REAP Grants Program) ($9838), **2010**. Collaboration with Don Trisel, Steve Roof, Tom Tucker, Chris Warnick and Kevin Smith (STAND).
- Undergraduate Research Program Grant ($3000), **2008** Collaboration with Dr. Don Trisel, Kylie Jones, Larisa Lynch and Chris Warnick, entitled, "Waste Stream Cost Analysis."

Faculty Data

Name : Matthew Scanlon Rank: Professor

Check One: Full-time_X___ Part-time _____ Adjunct _____ Graduate Asst. _____

Highest Degree Earned _Ph.D_____ Date Degree Received ___1988 _____

Conferred by ____Montana State University _____

Area of Specialization ____Physical Chemistry_____

Professional registration/licensure ___ Yrs. of employment at present institution _21_____
Years of employment in higher education _22___ Yrs. of related experience outside higher education_2_____
Non-teaching experience _____

To determine compatibility of credentials with assignment:

(c) List courses you taught this year and those you taught last year: (If you participated in team-taught course, indicate each of them and what percent of courses you taught.) For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number & Title	Enrollment
2010 Fall	Chem1105 Chemical Principles I	69
2010 Fall	Chem2205 Analytical Chemistry	14
2010 Fall	Chem4405 Advanced Integrated Lab	19
2010 Fall	Chem4450 Advanced Inorganic Chem	7
2010 Fall	Chem4401 Independent study	1
2010 Fall	Chem4403 Independent Study and reaseach	1
2011 Spring	Chem2215 Instrumental Analysis	8
2011 Spring	Chem4455 Advances in Modern Chemistry	16
2011 Spring	Chem4401 Independent Study	3
2011 Summer	Chem1101 General Chemistry I	23
2011 Fall	Chem1105 Chemical Principles I	40
2011 Fall	Chem2205 Analytical Chemistry	17
2011 Fall	Chem3301 Physical Chemistry Lab 1	10
2011 Fall	Chem4401 Independent study	1
2011 Fall	Chem4998Undergraduate Research Honors	1
2012 Spring	Chem1106 Chemical Principles (II)	26
2012 Spring	Chem2201 Analytical Chemistry	8
2012 Spring	Chem3302 Physical Chemistry	6
2012 Summer	CHem1101 General Chemistry I	25

(n) If degree is not in area of current assignment, explain. **Degree is in area of current assignment**

(o) Identify your professional development activities during the past five years.
Restructuring of chemistry 1105, and chemistry 2200
Restructuring Chem. 2205
Development of a new course Chem. 3315 Instrumental Analysis

(p) List awards/honors (including invitations to speak in your area of expertise) or special recognition In last five years.

(q) Indicate any other activities which have contributed to effective teaching.
Attending of Quality Matters Training Workshop

(r) List professional books/papers published during the last five years. **None**

(s) List externally funded research (grants and contracts) during last five years.
Pittsburgh Spectroscopy Grant $5000.

Faculty Data

Name : ___James Weekley_____Rank: Instructor

Check One: Full-time__X___ Part-time _____ Adjunct _____ Graduate Asst.

Highest Degree Earned _____M.S._____ Date Degree Received ___May 2005__

Conferred by ____University of Kentucky

Area of Specialization ____Pharmaceutical Sciences

Professional registration/licensure ___ Yrs. of employment at present institution ___7____
Years of employment in higher education __7___ Yrs. of related experience outside higher education ___6___
Non-teaching experience __6___

To determine compatibility of credentials with assignment:

(d) List courses you taught this year and those you taught last year: (If you participated in team-taught course, indicate each of them and what percent of courses you taught.) For each course include year and semester taught, course number, course title and enrollment.

Year/Semester	Course Number & Title	Enrollment
2012 Fall	CHEM 1105 Chemistry Principles I Lab	14
2012 Fall	CHEM 1105 Chemistry Principles I Lab	15
2012 Fall	CHEM 1105 Chemistry Principles I Lab	16
2012 Fall	CHEM 1105 Chemistry Principles I Lab	15
2012 Fall	CHEM 1105 Chemistry Principles I Lab	15
2012 Fall	CHEM 4401 Independent Study	1
2012 Fall	CHEM 4998 Undergraduate Research	14
2012 Summer	CHEM 1102 General Chemistry II	21
2012 Spring	BIOL 3360 Biochemistry Lab	27
2012 Spring	CHEM 1106 Chemistry Principles II Lab	15
2012 Spring	CHEM 1106 Chemistry Principles II Lab	16
2012 Spring	CHEM 2225 Forensic Microscopy	13
2012 Spring	CHEM 4401 Independent Study	2
2012 Spring	CHEM 4998 Undergraduate Research-Hon	1
2011 Fall	CHEM 1105 Chemistry Principles I Lab	15
2011 Fall	CHEM 1105 Chemistry Principles I Lab	15

2011 Fall	CHEM 1105 Chemistry Principles I Lab	15
2011 Fall	CHEM 1105 Chemistry Principles I Lab	15
2011 Fall	CHEM 1105 Chemistry Principles I Lab	13
2011 Fall	CHEM 4401 Independent Study	2
2011 Summer	CHEM 1102 General Chemistry II	26
2011 Summer	SCIE 1010 Earth and Sky	5
2011 Spring	CHEM 1106 Chemistry Principles II Lab	15
2011 Spring	CHEM 1106 Chemistry Principles II Lab	12
2011 Spring	CHEM 1106 Chemistry Principles II Lab	13
2011 Spring	CHEM 1106 Chemistry Principles II Lab	12
2012 Spring	CHEM 1106 Chemistry Principles II Lab	15

(t) If degree is not in area of current assignment, explain.

My research in graduate school was a combination of analytical, physical and radio chemistry conducted in a College of Pharmacy and not in a chemistry department hence the Pharmaceutical Science title.

(u)

(v) Identify your professional development activities during the past five years.

Blackboard training

(w) List awards/honors (including invitations to speak in your area of expertise) or special recognition

In last five years.

(x) Indicate any other activities which have contributed to effective teaching.

(y) List professional books/papers published during the last five years. **None**

(z) List externally funded research (grants and contracts) during last five years. **None**

Appendix III: Compliance with Degree Definition Policy

B.S. Degree in Chemistry

Required Major Courses			**HRS**	
CHEM 1105		Chemical Principles	5	
CHEM 2200		Foundational Biochemistry	4	
CHEM 2201		Organic Chemistry I	4	
CHEM 2202		Organic Chemistry II	4	
CHEM 2205		Analytical Chemistry	4	
CHEM 3315		Instrumental Analysis	4	
CHEM 3301		Physical Chemistry I	4	
CHEM 3304		Inorganic Chemistry	4	
CHEM 4404		Synthetic Methods and Materials	4	
CHEM 4412		Physical Chemistry II	4	
BIOL 3360		Biochemistry	4	
PHYS 1101 OR 1105		Introduction to Physics I / Principles of Physics I	4-5	
PHYS 1102 OR 1106		Introduction to Physics II / Principles of Physics II	4-5	
MATH 1185 OR 1190		Applied Calculus I / Calculus I	4	
MATH 1186 OR 3315		Applied Calculus II / Calculus II	4	
TOTAL Required Major Courses				61-63
Major Electives				0
Minor Electives				0
TOTAL HOURS FOR MAJOR				**61-63**
Required General Studies Courses				
First Year Experience				15-16
ENGL	1104	Written English I	3	
ENGL	1108	Written English II	3	
INFO	1100	Computer Concepts and Applications	3	
MATH			3-4	
COMM	2200, 2201, OR 2202	Communication	3	
Scientific Discovery				8
Cultural / Civilization Exploration				9
Society / Human Interactions				6
Artistic / Creative Expression				6
TOTAL GENERAL STUDIES HOURS				**33**
TOTAL FREE ELECTIVES				**32-34**
TOTAL HOURS				**128**

Appendix IV: External Review

2/25/13

To whom it may concern,

I am currently a research chemist for the US Army Corps of Engineers and serve as a collateral professor at Virginia Commonwealth University and adjunct professor at Louisiana Tech University. I earned my PhD in chemistry from West Virginia University in 2004 and graduated with a chemistry degree from Fairmont State University in 2000. Presently, I have over 30+ peer reviewed publications and author a blog focusing on the recent advances in nanochemistry. My external review of the Chemistry Department is grounded from my experiences, previously submitted program reviews and discussions with current faculty members.

Personally as an undergraduate student I felt that the Chemistry Department at Fairmont State did a remarkable job preparing me for graduate school. I was able to pass all of my qualifying exams upon entrance. It appears over the last 5 years that this trend is still viable since 97% (n=29) of the students are employed or seeking continued education, most of which are in chemistry related fields.

Also, it is noteworthy to see that the Chemistry Department is offering multiple degrees with emphasis on biotechnology in addition to the traditional BS (which is ACS approved) and a BA for educators specializing in chemistry. It is also beneficial to the department that the goal of

the department is to have at least one full time faculty member teaching a section of service courses every term rather than adjunct professors, graduate students, etc., as is often the case in larger Universities. I believe having full time faculty teaching these courses is the primary reason the average success rate for service courses is quite high, specifically 87.0% (median 87.5%).

In regards to the students it was pleasantly surprising to see that the chemistry majors take COMM 2200 Intro to Human Communication and give presentations in various courses (poster, oral and online). Traditionally these skills are not emphasized in the undergraduate curriculum compared to writing skills, but are very much needed for those seeking a graduate level education and even jobs in chemistry related fields.

With five full time faculty the teacher student ratio is quite high, especially in the upper level chemistry courses. Personally, I feel this is the Chemistry Department's greatest asset which reflects directly on the students; which is why the first positive aspects of the chemistry program states "Impressive level of confidence, competence, independence and achievement exhibited by graduates." It is also admirable that the faculty emphasizes ethics and addresses plagiarism as a professional goal.

I also feel that the use the ETS test in chemistry and the ACS Diagnostic of Undergraduate Chemistry Knowledge (Form 2008) test as well as the standardized tests from the American Chemical Society to assess the performance of the students in both major and service related courses provide the faculty with a good metric to measure student performance. Having a modest upward trend is visible over the past 6 years for ETS testing and consistently having the strongest students each year score in the 60-75th percentile nationally is indicative of a successful program.

It would be nice to see more students graduating in the field of chemistry. However in their program review one possible remedy comes from Dr. Anthony Gilberti, Dean of the College of Science and Technology, with the STEM center grant focused on recruitment and retention. Also, the ACS Student Affiliates Club is making efforts to help these numbers.

Also, I feel it would be beneficial to the majors if the Chemistry Department had more connections/collaborations with neighboring industries and/or government labs for the students interested in pursuing a career in chemistry.

Thanks,

Garry P. Glaspell Ph.D.

USACE ERDC; Chemist

Fellow, Center for the Study of Biological Complexity (VCU)

Collateral Professor, Department of Chemistry (VCU)