West Virginia State University Board of Governors
Academic Policies Committee
Erickson Alumni Center, Weisberg Lounge
April 27, 2017
10:00 a.m. – 11:00 a.m.
Agenda

1. Call to Order and Roll Call – Mr. Paul Konstanty presiding in absence of Chair
2. Verification of Appropriate Notice of Public Meeting 2
3. Review and Approval of Agenda 1
4. Review and Approval of Minutes of Previous Meeting 3
5. University Recommendations and Reports
   - 5.1 Program Review
     - 5.1.1 Chemistry, B.S. 10
   - 5.2 Recommendation to discontinue recreation academic program
6. Next Meeting Date – *June 15, 2017*
7. Adjournment

West Virginia State University
Academic Policies Committee

Date/Time: 4/27/2017 -- 10:00 AM

Location:

West Virginia State University
Erickson Alumni Center
Weisberg Lounge
Institute, WV

Purpose: To conduct the regular business of the Committee in preparation for the April 27, 2017 Board of Governors meeting.

Notes:

This is a compliant meeting.

Meeting was approved: 4/19/2017 10:31:34 AM

West Virginia State University Board of Governors
Academic Policies Committee
Erickson Alumni Center, Weisberg Lounge
Minutes
January 26, 2017

1. **Call to Order and Roll Call**
   Mr. Konstanty called the meeting of the West Virginia State University Board of Governors Academic Policies Committee to order at 10:35 a.m.

   Present: Dr. Guetzloff, Mr. Kelley, Mr. Konstanty, Ms. Shafer, and Dr. Thralls. Several members of the administration, faculty, and staff were also present.

2. **Verification of Appropriate Notice of Public Meeting**
   Mr. Konstanty announced the Verification of Appropriate Notice of Public Meeting.

3. **Review and Approval of Agenda**
   Mr. Konstanty asked for approval of the agenda. Dr. Thralls made the motion, and it was seconded by Dr. Guetzloff. The motion passed.

4. **Review and Approval of Minutes of Previous Meeting**
   Mr. Konstanty asked for approval of the minutes from the November 10, 2016 meeting. Mr. Kelley made the motion, and it was seconded by Ms. Shafer. The motion passed.

5. **University Recommendations and Reports**

   1. Dr. Sherri Shafer and Ms. Kim Cobb of the Communications Department were present for the follow-up reviews of the Communications, B.A. and Media Studies, M.S programs.

   Dr. Jayasuriya explained that the new assessment protocols have changed. There is a new Institutional Research Director, Mrs. Vicky Morris-Dueer, whom has helped the assessment procedures improve. Dr. Jayasuriya mentioned the assessment process was not going well in the Communications department and a new chair had to be brought in, that being Dr. Sherri Shafer. Interim Dean Wallace seconded what Dr. Jayasuriya said about the new leadership is leading to better results in assessment.

   Dr. Shafer has met with Mrs. Morris-Dueer and they have been working on a five year plan for assessment. Mrs. Morris-Dueer confirmed that she had been working with the Communications department for their assessment. Dr. Shafer assured the committee that they will have hard data for assessment when it is time for their next Program Review. Dr. Shafer mentioned that they were working on recruitment, trying to obtain funds for various things, and looking into grant writing. The department is working on introducing into the EPC next semester a 4 + 1 Master's Program for Media Studies.
   Dr. Jayasuriya called upon Mrs. Morris-Dueer to speak about the assessment process. She stated that she has seen improvement in reports since taking over the position. Dr.

Jayasuriya stated for the record that he and Mrs. Morris-Dueer have worked closely together.

Ms. Kim Cobb stated that there is a 4 + 1 Master's Degree program in the works for Media Studies. They are in the process of making courses available for this program. The assessment will reflect this program as well. Dr. Guetzloff inquired if the individual student would get two degrees with this program. Dr. Jayasuriya explained that the student would get both a bachelor's degree and a Master's degree in five years. He also explained that some senior level classes in the undergraduate program would count towards the Master's program and that is why it is a 4 + 1 program.

Dean Wallace stated that he felt some of the projects in the Communications department would be hard to asses, for example the Stephen King project from Fall 2016. He feels that the department is very strong in their General Education, for example their Speech Communication classes. Dr. Shafer mentioned that the student organization were thriving, and Ms. Cobb agreed and added that the Communications department had the most student organizations on campus. She also stated that despite budget cuts they still have a presence with West Virginia Broadcasting.

Mr. Konstanty made a general comment on the Communications, B.S. follow up review. He mentioned that he had a discussion with Dr. Scott Woodard about partnering with athletics to try and broadcast games. Mr. Konstanty was inquiring as to why this has not happened, especially since it affects retention. Dr. Shafer and Ms. Cobb both explained that some equipment they received through a donation did not match their hardware. Also, the new equipment they have will do minimal as it is large and bulky and has to be carried around. Dr. Jayasuriya suggested that a conversation take place after the meeting with the appropriate staff and faculty about this project. Side note: as of February 16, 2017 a class has been added to the fall schedule for Sports Broadcasting.

Dr. Thralls commented that he is impressed with the spirit of willingness from the Communications department and that he has no negative feelings towards the programs. He is encouraged by all the prospects that are coming about from the department.

Dean Wallace commented that the Communications and Media Studies programs are helping move the University along and feels they should be fully supported. Dr. Jayasuriya said that the University has not been able to obtain the equipment needed for the department but assured the committee when funding is available they will build upon it. Dean Wallace then mentioned that the Communications department was trying to diversify its program and look into other areas such as healthcare communications and marketing. Dr. Jayasuriya explained all the different programs that needed funding as well and that the University has had to make hard decisions faced with budget cuts. Dr. Guetzloff commented that Title III was taken out of Academic Affairs three years ago and that not having that program has also been one reason funding has not been available to all programs.

Dr. Guetzloff inquired if there were lab fees for the Communications department that could be used to help with funding. Dr. Shafer explained that there were fees but they were not adequate to purchase the necessary equipment and software. Dr. Thralls asked if there were any avenues to obtain equipment grants for the department. Ms. Cobb explained that many grants they have found are for classroom equipment and not broadcasting equipment. Dr. Shafer explained that it is difficult to find grant money in the Arts and Humanities of academia.

Mr. Konstanty inquired if there was an option to partner with any local television networks or ad agencies to help with equipment. Dean Wallace commented that was an excellent idea to look into. Mr. Konstanty suggested using some of the committee contacts to use as resources to help in this situation.

6. **Next Meeting Date –** *March 16, 2017*

7. **Adjournment**
   With there being no further business, a motion was made by Dr. Thralls, and seconded by Mr. Konstanty to adjourn the meeting. The motion passed. The meeting adjourned at 11:22 a.m.

Respectfully submitted,

Betsy L. Allen

West Virginia State University Board of Governors
Academic Policies Committee
Erickson Alumni Center, Weisberg Lounge
Minutes
March 16, 2017

1. Call to Order and Roll Call

Mrs. Pitchford called the meeting of the West Virginia State University Board of Governors Academic Policies Committee to order at 10:33 a.m.

Present: Dr. Guetzloff, Mr. Kelley, Mr. Konstanty, Mrs. Pitchford, Ms. Shafer, and Dr. Thralls. Several members of the administration, faculty, and staff were also present.

2. Verification of Appropriate Notice of Public Meeting

Mrs. Pitchford announced the Verification of Appropriate Notice of Public Meeting. Mr. Konstanty made the motion, and it was seconded by Ms. Shafer. The motion passed.

3. Review and Approval of Agenda

Mrs. Pitchford asked for approval of the agenda. Mr. Konstanty made the motion, and it was seconded by Dr. Thralls. The motion passed.

4. Review and Approval of Minutes of Previous Meeting

Mrs. Pitchford asked for approval of the minutes from the January 26, 2017 meeting. Mr. Konstanty requested a correction be made to page 4, paragraph 3. Dr. Thralls made the motion to approve the minutes with the correction, and it was seconded by Mr. Konstanty. The motion passed.

5. University Recommendations and Reports

5.1 Return on Investment of Four Programs with Low Graduation Numbers

Dr. Jayasuriya explained that President Jenkins and the Board of Governors had requested that he look at all programs concerning the number of students in each program and the graduation rates from the previous five years. The criteria they used were: number of students, number of graduates in the last five years, the credit hours generated by the program, and if it was a graduate program or undergraduate program. The four programs with the lowest productivity were Economics, Music, Recreation, and Sociology. Dr. Jayasuriya pointed out that the music degree program had only started the previous year.

Dr. Jayasuriya provided a presentation with the instructional costs and Return on Investment (ROI) figures. He explained that a template from other universities for the information was implemented, and the University conducted a cost analysis of the four programs. He also explained that the ROI needs to be greater than 100 percent. In the spreadsheet provided, the instructional cost was given for each program. This included *Faculty FTE, Tenured and Eligible Faculty, Tuition Revenue, Faculty Cost, Student Credit Hours (SCH)* among other considerations. He also explained that students do

not pay for credit hours over twelve and that was not taken into account in the cost analysis.

a. Economics: The ROI for the program is 172 percent.
b. Music: Dr. Jayasuriya explained how the music lessons counted for full-time faculty are different from how they are counted for adjunct faculty. The ROI for music was 151 percent.
c. Recreation: The ROI for the program is 42 percent. Dr. Guetzloff inquired if the expenses included advertising. Dr. Jayasuriya explained that it was only the program's faculty salary, benefits, and supplies. Dr. Thralls asked if the Board had eliminated a track, and it was confirmed that the therapeutic recreation program was eliminated last year. Mr. Kelley asked if the numbers would be more skewed by the fact that the students do not pay above twelve credit hours. Dr. Jayasuriya said the numbers could go down, including the ROI.
d. Sociology: The ROI for the program is 160 percent.

Mr. Kelley inquired as to what would be seen in more vibrant programs, and Dr. Jayasuriya said it would be an ROI of above 150 percent. He also explained that the University was not losing money, but there are more expenses than what is listed on the spreadsheet. Mrs. Pitchford inquired as to what student faculty ratio the University was working towards. Dr. Jayasuriya said it needed to be between 18 to 1 and 20 to 1, therefore 18 to 1 is good and campus wide the University is at 17 to 1.

Mrs. Pitchford inquired of Dr. Jayasuriya if he had any recommendations based upon the report. He said that he would like to eliminate programs operating under an ROI of 100 percent and keep the other programs. Mrs. Pitchford asked if the Committee would take action on the recommendation. Mr. Konstanty said that he did not think they could at this time, and Dr. Guetzloff agreed. Dr. Thralls commented that the Committee would need to be proactive about decisions made about other programs before it is not an option. Mrs. Pitchford felt it needed to be a business decision.

Dr. Guetzloff asked if retention data could be added to the information given to the Committee on the ROI. Dr. Jayasuriya stated that a retention package of all the information was included in the meeting packet, but not as part of the presentation.

5.2 Intent to Plan

5.2.1 BS in Engineering

Dr. Jayasuriya commented that, even with question of funding, the University feels that an engineering degree would be beneficial to the University. He mentioned that students have been inquiring, as well.

Dr. Thralls motioned that the Committee approve the Intent to Plan for a Bachelor of Science in Engineering. Dr. Guetzloff seconded the motion, and the motion passed.

5.2.2 MS in Computer Science

Dr. Jayasuriya explained that the computer science program has continued growing. The current students were polled to see if they would continue on at the University if a master's program was offered, and the results were positive. Dr. Thralls pointed out that there was one full-time faculty member in the computer science program, and Dr. Jayasuriya explained that the program is cross listed with Mathematics and classes are taught by both computer science and mathematics. Dr. Jayasuriya assured the Committee that Academic Affairs would be filling more positions in the computer science program.

Dr. Guetzloff motioned that the Committee approve the Intent to Plan for a Master of Science in Computer Science. Ms. Shafer seconded the motion, and the motion passed.

5.2.3 MS in Sports Studies

Dr. Aaron Settle explained that the sports studies program was growing quickly and had over 100 students. He stated, with new national standards for athletic coaches coming out, professionals would need advanced degrees to obtain jobs in the field. Dr. Settle is hoping to retain all the students in the bachelor's degree program for the master's program. He also felt that alumni and teachers in the area would be interested in the master's program.

Mr. Kelley motioned that the Committee approve the Intent to Plan a Master of Science in Sports Studies. Mr. Konstanty seconded the motion, and the motion passed.

5.3 Program Reviews

5.3.1 Mathematics, B.S.

Dr. Jayasuriya commented that the assessment plan and data have continued to improve. Dr. Morris-Dueer could be asked for more information regarding the assessment. Dr. Jayasuriya went on to explain the three purposes for the math department: math program, math education students, and service courses. Every academic program requires math courses.

Dr. Thralls recommended to the Provost that the advisory committee for the Department of Mathematics be activated in the next year without the formal requirement of a follow-up review. Mrs. Pitchford supported that recommendation. Dr. Michael Anderson commented he would implement the advisory committee with guidance from Dr. Jayasuriya.

Dr. Guetzloff motioned that the Committee approve the program review for the Mathematics, B.S. with the suggestion of the amendment to implement within one year the external advisory committee. Dr. Thralls seconded the motion, and the motion passed.

5.3.2 Computer Science, B.S.

Dr. Guetzloff inquired if he should recuse himself from the computer science discussion as his son is part of the program. Mrs. Pitchford recommended that he stay for the presentation but he could recuse himself from the vote. Dr. Jayasuriya commented there was a concern of only having one faculty member in the program, but explained that faculty from mathematics would also be teaching in the program.

Dr. Thralls recommended to the Provost that he ensure that the advisory committee for the computer science program be activated in the next year without the formal requirement of a follow-up review. Dr. Anderson commented that the program has continued to grow since the initial report was created. Dr. Jayasuriya added that he felt the program would bring in interest from the international program, as well.

Dr. Guetzloff motioned that the Committee approve the program review for the Computer Science, B.S. with the suggestion of the amendment to implement within one year the external advisory committee. Ms. Shafer seconded the motion, and the motion passed.

Mrs. Pitchford thanked Dr. Jayasuriya for all of the information he has provided the Committee with for the meeting.

6. **Next Meeting Date**
   April 27, 2017

7. **Adjournment**
   With there being no further business, a motion was made by Dr. Thralls and seconded by Mr. Konstanty to adjourn the meeting. The motion passed. The meeting adjourned at 11:22 a.m.

Respectfully submitted,

Betsy L. Allen

Chemistry, B.S. Program Review

West Virginia State University

Comprehensive Program Review

for

Bachelor of Science in Chemistry

Submitted to

The Program Review Committee

Fall 2011-Spring 2016

TABLE OF CONTENTS

TABLE OF CONTENTS

SECTION I: PROGRAM DESCRIPTION

A. Program Purpose Statement

The purpose of the program offered by the Department of Chemistry is to prepare students for careers in chemistry-related industries, government, health care and chemical education as well as the pursuit of advanced degrees in graduate schools in chemistry, or professional schools in pharmacy or medicine. To cater for the wide array of post-graduation endeavors, the Department offers three options in the Bachelor of Science degree program: American Chemical Society Certified, Applied, and Pre-Medical/Pre-Pharmacy Sciences. Our program provides service courses to several degree programs including biology, mathematics, computer science, pre-engineering and education. The Department also offers a general education courses to acquaint all University students with the basic concepts of chemistry and the important role the discipline plays in the world today.

B. Program Outcomes

At the completion of the program of study leading to the Bachelor of Science degree in Chemistry, the student will be able to:

1. Explain the fundamentals in organic, analytical, physical, inorganic and biological chemistry.
2. Perform practical, standard laboratory procedures and techniques.
3. Apply problem-solving strategies to scientific problems.
4. Obtain and utilize information from the chemical literature.
5. Demonstrate communication skills pertaining to chemistry.
6. Conduct independent, systematic research.

C. Consistency with University Mission

The University Mission states: "West Virginia State University will meet the higher education and economic development needs of the state and region through innovative teaching and applied research." Values guiding the University's decisions and behavior include; academic excellence, academic freedom, advancement of knowledge through teaching, scholarship, creative endeavor, and community service.

The program in the Department is accredited by the Committee of Professional Training of the American Chemical Society, ACS, whose guidelines ensure rigorous departments with modern and well maintained infrastructure, and provide a coherent chemistry curriculum.

The Department advances knowledge through teaching, research, and community service. The curriculum meets the requirements of the American Chemical Society, and all chemistry majors are required to take at least three credit hours of student research. Faculty also engage students in extra-curricular research activities such as NASA Scholarship, Summer Undergraduate Research Experience (SURE), and Research Rookies. The faculty and the student chapter of the ACS, Student Members of the ACS, SMACS, have participated extensively in outreach to local area schools and community service. Activities have included taking science to local area schools, Boy Scout Chemistry Merit Badge, and hosting Red Cross blood drives.

The Department has fostered the lifelong growth, development and achievement of our students by preparing them for careers in government and industry, or admittance into graduate, medical, dental, and pharmacy schools.

D. Previous Reviews and Corrective Actions

The Department was asked to provide a follow-up report by Dec. 1, 2013, addressing Assessment and the Advisory Committee. This was inadvertently overlooked; the report was not submitted. The Department has addressed the issues of Assessment (See Section II E, Assessment), and the External Advisory Committee (See Section II F, Advisory Committee) during this review period.

E. Accreditation Information

1. Accreditation organization:

The American Chemical Society, ACS.

2. Year of accreditation:

The chemistry program at West Virginia State University has been accredited since 1972.

3. Accreditation status:

The program in the Department of Chemistry at West Virginia State University is accredited by the Committee on Professional Training of the American Chemical Society.

The BS Chemistry, American Chemical Society Certified (Option A) is the only option with ACS accreditation.

4. Accreditation organization report:

To maintain accreditation institutions must submit an Annual Review report and a Periodic Review report every six years (this was previously five years). The Annual Review report must report the number of degrees granted by the program, graduates and the certification status of the baccalaureate graduates, and supplemental information the curriculum and faculty. The Department has submitted these annually. To ensure compliance with ACS guidelines, accredited programs are required to submit a Periodic Report every six years about their program. The Department submitted a Periodic Report in 2012. The ACS response indicated no material deficiencies or corrective actions required. The next Periodic Report submission is due in 2018.

See Exhibit I page 65: The ACS report guidelines for the Periodic Review and Annual Review.

5. Deficiencies and corrective actions:

None.

SECTION II: ADEQUACY

A. Curriculum

a. Major: The Department of Chemistry offers three options in the Bachelor of Science degree program.

Option A: American Chemical Society Certified

This option is designed to prepare students to enter graduate schools to seek advanced degrees such as a Ph.D. in chemistry or related sciences.

Option B: Applied Chemistry (prior to AY 2012-2013 called General Emphasis)

This option affords the student the opportunity to obtain positions not only in industrial/environmental/governmental laboratories, but also in chemical sales/services sectors. Special emphasis is given to chemical practices which are environmentally benign.

Option C: Pre-Medical/Pharmacy Sciences (prior to AY 2012-2013 called Pre-Medical Emphasis)

This option prepares students to meet all the requirements for entrance to medical, dental, veterinary, or pharmacy schools. It also affords the student the opportunity to find employment in the industrial, governmental or corporate sectors. This option has an increased emphasis on biological content.

There are four components in the curriculums of all three options: (1) core courses, upper-division required courses and electives, (3) cognates, and (4) general education.

During this this review period there have been two WVSU institution–wide curriculum changes: (1) 120 Hours to graduate and, (2) The General Education curriculum was reduced from 51 – 53 credit hours to 38 – 40 credit hours. As a result there have been changes in the chemistry curriculums during this period.

In AY 2011 – 2012, core courses totaled 44 credit hours, upper-division required courses and electives 5 - 16 credit hours, cognates 20 - 33 credit, and general education 51 – 53 credit hours. The number of credit hours for upper-division required courses and elective, and cognates varied depending upon the option. Total hours required for the degree were 126 – 134 depending upon the option.

AY 2012 – 2013 to AY 2015 – 2016, the Department effected the 120 hours to graduate for Options B and C. This was done by making Math 206 (Calculus I) the first Math cognate course, thus removing 100 level Math classes from the curriculum. However due to the curriculum requirements of the American Chemical Society, Option A could only be reduced to 128 hours. Core courses totaled 44 credit hours, upper-division required courses and electives 8 - 20 credit hours, cognates 14 - 26 credit, and general education 51 – 53 credit hours.

In the Spring semester of AY 2015 – 2016, the new General Education curriculum went into effect. This reduced the General Education credit hours from 51 – 53 to 38 – 40. The reduction in General Education credit hours, freed up hours for electives.

The curricula during this review period are in Appendix II-A.

During this review period three new courses were added to the curriculum; Environmental Toxicology (CHEM 356, 3 credit hours), Green Chemistry (CHEM 357, 3 credit hours), and

Undergraduate Library Research (CHEM 420, 1 credit hour). The former two are upper-division required courses in Option B, while the latter is an elective. Environmental Toxicology is designed with the future industrial chemist in mind with the focus on how chemicals we make today affect our health tomorrow. Green Chemistry or environmentally benign chemistry involves the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances.

B. Faculty

The Department currently has seven full-time faculty members. Six hold terminal degrees while the seventh is pursuing his terminal degree on a Title III grant (86 percent of the faculty have terminal degrees). Six of the faculty members are tenured (86 percent of the faculty are tenured) while the seventh is term faculty.

The Department faculty members' primary areas of specialty span the chemistry sub-disciplines; analytical, inorganic, organic, and physical.

The two-page Faculty Data sheets are included for the seven full-time and two part-time faculty in Appendix II-B.

C. Students

1. Entrance Standards:

There are no additional entrance standards beyond those required by West Virginia State University for admission into the Chemistry degree programs. Placement into the first courses in the major, General Chemistry I Lecture and Lab (CHEM 105 and 107) is contingent upon meeting the Math 120 (College Algebra) co-requisite.

Advanced Placement Chemistry score of 3 earns the student credit for CHEM 105. A score of 4 earns credit for CHEM 105 and 107. A score of 5 earns credit for the entire General Chemistry I and II Lecture and Lab sequence, CHEM 105, 206, 107, and 108.

2. Entrance Abilities:

The entrance abilities of students admitted to West Virginia State University are measured by their ACT scores and High School GPA.

The following of indicators of academic readiness for first-time full-time freshmen cohorts 2011 – 2015 is an average of the average yearly scores that were provided by the Office of Institutional Research, Assessment, and Effectiveness.

WVSU Academic Readiness

	ACT English	ACT Math	ACT Composite	HS GPA
Chemistry Major	20.8	20.3	20.9	3.17
All Majors	19.8	18.5	19.9	3.05

The average ACT scores for the chemistry majors were typically higher than for all majors, as was the mean High School GPA.
See Exhibit II page 69. Table 1. Indicators of Academic Readiness for First-time Full-time freshmen cohort fall 2011 – 2015.

3. Exit Abilities:

The Department has since spring 2014 administered the ACS Diagnostic of Undergraduate Chemistry Knowledge (DUCK) Examination as a measure of exit ability. The DUCK exam is designed to be taken at or near the end of a four-year curriculum. The results were compiled as the percent of correct answers in the chemistry sub-disciplines. In the exam administered in Spring 2014 student scores in the chemistry sub-disciplines increased in the following respective order; biological, physical, inorganic, analytical, and organic chemistry. Student correct responses were 38%, 40%, 44%, 48%, and 52% respectively. In the exam administered in Spring 2015 student scores increased in the following respective order; biological, analytical, physical, organic, and inorganic chemistry. Student correct responses were 38%, 46%, 47%, 49%, and 53% respectively.

Another indicator of exit abilities is a graduating student's GPA. The University-wide average graduating GPA has ranged from 3.0 to 3.1 in this review period, while that of the Chemistry graduates ranged from a low of 2.03 to a high of 3.6. The average Chemistry graduate GPA was 2.96.

See Exhibit II page 69. Table 2. Indicator of Academic Exit Abilities of All Undergraduates 2011 – 2015.

4. Graduates:

Of the 13 students who graduated in this review period, two went on to graduate school, one to pharmacy school, one to dental school, one is employed by a state government lab, and two are employed in the chemical industry. One graduate is employed by a car rental company in a non-chemistry related capacity, while another joined a major league baseball organization as a baseball player.

The Department was unable to find information on four of the graduates.

D. Resources

1. Financial

The BS Chemistry program has two primary sources of financial support: E & G (Education and General) funds allocated by the University and Science Lab Fee.

Over this review period the University allocated the Department E & G funds in the amount of $22,000**.** The last three years this funding has been $850 annually. These monies have been used to purchase office supplies, and materials for the Department's educational activities.

The Science Lab Fee collected from each student taking a chemistry laboratory course is now the major source of funding for the Department. This fee for a student has ranged from $40 to $52 over this review period**.** Over this period the Department has collected over $104,000. The monies have been used to purchase chemical reagents, glassware, lab equipment/instruments and supplies, and instrument maintenance.

For additional information see Exhibit III, page 71. Department of Chemistry Financial Information.

2. Facilities

The Department of Chemistry is housed in Hamblin Hall, which was built in 1952 and renovated in 1989. Currently, the Department of Chemistry occupies parts of the basement, and the second and third floors of the building. The department has classrooms, teaching laboratories, faculty research laboratories, and faculty offices. Chemistry classrooms are H212 and H213. Shared classrooms are H005, H007 (the Thomas R. Cabbell Auditorium), and H107. The auditorium is equipped with a smart podium while the other classrooms have computer projection. Chemistry teaching laboratories include rooms H222 (Physical Chemistry and Biochemistry), H224 (Instrument Lab), H302 (Organic and Inorganic Chemistry), H311 (Computer Lab), H320 and H324 (General Chemistry, Allied Health General Chemistry, Elementary Organic Chemistry and Biochemistry, and Consumer Chemistry). Associated with the teaching laboratories are H323 (Analytical balance room) and H326 and 328 (Lab preparation).

Chemistry faculty research laboratories are housed H202, H204 (shared with Biology), H310 and H321.

Rooms H224 and H228 are used to house major research instruments many of which are also used for teaching. The Department has the following instruments: 400 MHz Nuclear Magnetic Resonance spectrometer, Infra-Red spectrometer, Fourier Transform Infra-Red spectrometer, Atomic Absorption spectrometer, Ultra Violet Visible spectrometer, Gas Chromatograph, High Performance Liquid Chromatograph, Liquid Chromatograph Time of Flight Mass Spectrometer, Fluorescence spectrometer, Polarimeter, and Inductively Coupled Plasma Optical Emission Spectrometer. The 400 MHz Nuclear Magnetic Resonance spectrometer and the Liquid Chromatograph Time of Flight Mass Spectrometer, were acquired by the Department during this Program Review period.

The Department of Chemistry uses seven faculty offices in the building, four on the second floor (H215, 217, 223, and 225), and three on the third floor (H325, 327, and 329).

E. Program-Level Assessment

1. Assessment Procedures

2011 -2013

During AY 2011 – 2012 the Department, under the guidance of the WVSU's Assessment Director, wrote up new Program Learning Outcomes (PLOs), developed an assessment

plan, and Curriculum-Mapped the PLOs. Assessment data was to be collected on every student, at every assessment point, on every PLO, every semester, and stored in the University's LiveText account.

B.S. Chemistry PLOs

1. **Foundation Courses** – Demonstrate an understanding of the course work in core areas of chemistry (analytical, biochemistry, inorganic, organic and physical) that provide a modern foundation for subsequent in-depth studies.
2. **In-Depth Courses** – Demonstrate an understanding of the course work that builds upon foundation courses; in-depth courses build upon a foundation area, focus on a specific area within the chemical sciences, or provide a modern chemistry perspective to an interdisciplinary topic.
3. **Laboratory Experiences** – Ability to engage in and learn from "hands-on" laboratory experiences that involve the synthesis of molecules and the measurement of chemical properties and phenomena; "hands-on" experiences with modern instrumentation are included.
4. **Information and Literature Searching** – Demonstrate the ability to effectively use primary and secondary chemical literature and scientific databases.
5. **Computational Chemistry** – Demonstrate a proficiency in computer modeling to understand and predict chemical properties and phenomena.
6. **Research** – This includes opportunities for undergraduates to participate in the basic discovery process that leads to the creation of new knowledge. Students will be able to apply their chemistry knowledge and skill; Demonstrate the ability to turn undergraduate research results into a comprehensive written report.
7. **Professional Skills** – Development of the ability to work safely in a laboratory environment; effective oral and written communication; the ability to work effectively as a member of a team; the ability to ask questions, design experiments, and interpret results within the context of current scientific knowledge; the behaviors and thought patterns leading to innovation; enhanced leadership abilities; the capacity for lifelong learning; and the internalization of an intellectual framework leading to ethical scientific conduct.

The assessment procedures are documented below as; Assessment point (PLOs assessed)). Assessment instrument, and Assessment tool.

Chem. 106; General Chemistry II (PLOs 1): American Chemical Society (ACS) Exam, and Item analysis.

Chem. 108; General Chemistry Laboratory II (PLOs 1, 3, 7): A Laboratory Report, and Rubric analysis.

Chem. 206; Organic Chemistry II (PLOs 2): American Chemical Society (ACS) Exam, and Item analysis.

Chem. 208; General Chemistry Laboratory II (PLOs 2, 4, 7): A Laboratory Report, and Rubric analysis.

Chem. 301; Physical Chemistry I (PLOs 1, 2): American Chemical Society (ACS) Exam, and Item analysis.

Chem. 303; Physical Chemistry Laboratory I (PLOs 1, 2, 3, 5, 7): A Laboratory Report, and Rubric analysis.

Chem. 350; Junior Seminar (PLOs 2, 4, 7): Term Paper, and Rubric analysis.

Chem. 450; Senior Seminar (PLOs 2, 4, 7): Oral Presentation and Rubric analysis. The ACS Diagnostic Undergraduate Chemistry Knowledge (DUCK) exam.
Chem. 460, 461, 462; Directed Student Research (PLOs 1, 2, 3, 4, 5, 6): Lab Note Book and Oral Presentation, and Rubric analysis.

Data was collected and uploaded into LiveText by the then Assistant to the Dean, and individual faculty members. During AY 2012 – 2013 difficulties occurred with uploading assessment data into LiveText and its use was discontinued the following academic year.

Some members of the Department attended an Assessment Workshop at WVSU conducted by Dr. Susan Hatfield in February 2013 after which it was determined that the Department's PLOs required re-working. The faculty decided to re-draft the PLOs based on those the Department had prior to 2011.

2013 - 2014

The current Program Learning Outcomes – whose final language was in consultation with Dr. Susan Murphy, an assessment consultant who conducted a workshop at WVSU in February 2014 - were put into effect and curriculum-mapped. The assessment plan remained essentially the same, with the same assessment points, and objective of assessing all the PLOs for every student all the time. Please See Exhibit IV page 73. The Assessment Timeline.

A Graduate Exit Survey aligned with the Department's program learning outcomes was written in spring 2014. This indirect assessment instrument - soliciting information from our graduating seniors on how well they thought the Department is achieving its program learning outcomes – was administered in Senior Seminar. The students were sent an electronic copy of the survey, which they filled out, and returned the printed form to the Assistant to the Dean. The anonymity of the student is ensured as the printout returned has no hand-writing on it. Please see the Graduate Exit Survey in Appendix II-E.

The assessment procedures are documented below as; Assessment point (PLOs assessed)): Assessment instrument, and Assessment tool.
Chem. 106; General Chemistry II (PLOs 1, 3): American Chemical Society (ACS) Exam, and Item analysis.
Chem. 108; General Chemistry Laboratory II (PLOs 1, 2, 5): A Laboratory Report, and Rubric analysis.
Chem. 206; Organic Chemistry II (PLOs 1, 3): American Chemical Society (ACS) Exam, and Item analysis.
Chem. 208; General Chemistry Laboratory II (PLOs 1, 2, 3, 4, 5): A Laboratory Report, and Rubric analysis.
Chem. 301; Physical Chemistry I (PLOs 1, 3): American Chemical Society (ACS) Exam, and Item analysis.
Chem. 303; Physical Chemistry Laboratory I (PLOs 1, 2, 3, 4, 5): A Laboratory Report, and Rubric analysis.
Chem. 350; Junior Seminar (PLOs 1, 3, 4, 5): Term Paper, and Rubric analysis.
Chem. 450; Senior Seminar (PLOs 1, 2, 3, 4, 5, 6): Oral Presentation, and Rubric analysis (PLOs 1, 3, 4, 5). The ACS Diagnostic Undergraduate Chemistry Knowledge (DUCK) exam (PLOs 1, 3), and Item analysis. Graduate Exit Survey (PLOs 1, 2, 3, 4, 5, 6).

Chem. 460, 461, 462; Directed Student Research (PLOs 1, 2, 3, 4, 5, 6): Lab Note Book and Oral Presentation, and Rubric analysis.

Some data was collected but no meaningful analysis was done.

2014 – 2016

The assessment procedure of assessing every student at every assessment point for every PLO all the time, proved unwieldy. There were nine assessment points with 12 assessment instruments. The Department was attempting to collect too much data to handle.

From information gleaned from the assessment workshop conducted at WVSU by Dr. Susan Murphy, and the direction of the then Associate Provost and Vice President for Academic Affairs, it was determined that assessment did not have be done for every student at every assessment point for every PLO all the time as we had been previously made to believe.

The adopted assessment procedures are documented below as; Assessment point (PLOs assessed)): Assessment instrument, and Assessment tool.
Chem. 106; General Chemistry II (PLOs 1, 3): American Chemical Society (ACS) Exam, and Item analysis.
Chem. 206; Organic Chemistry II (PLOs 1, 3): American Chemical Society (ACS) Exam, and Item analysis.
Chem. 301; Physical Chemistry I (PLOs 1, 3): American Chemical Society (ACS) Exam, and Item analysis.
Chem. 450; Senior Seminar (PLOs 1, 2, 3, 4, 5, 6): The ACS Diagnostic Undergraduate Chemistry Knowledge (DUCK) Exam (PLOs 1, 3) and Item analysis. Graduate Exit Survey (PLOs 1, 2, 3, 4, 5, 6).

2. Use of Assessment Data: Learning-Teaching-Curriculum

2011-2012

Assessment data was collected at 10 assessment points and analyzed. This assessment procedure was however, changed in the subsequent years. Please see Appendix II-E for the Assessment Results, Spring 2012.

2014-2016
ACS second semester General Chemistry Exam.
The results of one section of the 2014-2015 students were item analyzed by topic or concept. The questions that were deemed most difficult covered concepts in Electrochemistry, Acids and Bases, and Acid-Base Equilibria and Solubility Equilibria.

The results of the three sections of 2015-2016 students who took this exam during the academic year were item analyzed by topic or concept. Questions where less than 25 percent of the students got correct were deemed most difficult. The questions that were deemed most difficult covered concepts in Physical Properties of Solutions, Chemical Kinetics, Acids and Bases, and Acid-Base Equilibria and Solubility Equilibria.

From the two sets of data, concepts in Acids and Bases, and Acid-Base Equilibria and Solubility Equilibria were most challenging to the students.

ACS two semester Organic Chemistry Exam.
The results of the two sections of 2014-2015 students were item analyzed by topic or concept. Each questions was classified intone of five topic/concept areas – General, Synthesis, Spectroscopy, Acid/Base, and Mechanism. Based on the item analysis data, students' areas of weakness were Mechanism and Synthesis.

ACS two semester Organic Chemistry Exam.
The results of two sections of 2014-2015 students were item analyzed again by topic or concept. Each question was reclassified into one of five topic/concept areas – General, Synthesis, Alkene, Spectroscopy, Carbonyl Chemistry, and Mechanism. Based on the item analysis data, students' areas of greatest weakness were Carbonyl Chemistry and Synthesis. Student correct responses were 32 percent and 33 percent respectively.

ACS two semester Organic Chemistry Exam.
The results of two sections of 2015-2016 students were item analyzed by topic or concept. Each question was classified into one of five topic/concept areas – General, Synthesis, Alkene, Spectroscopy, Carbonyl Chemistry, and Mechanism. Based on the item analysis data, students' area of greatest weakness was Carbonyl Chemistry in which less than 25 percent of the student responses were correct.

From the two sets of data, concepts in Carbonyl Chemistry were most challenging to the students.

ACS first semester Physical Chemistry Exam.
An item analysis of the 2015-2016 student test responses by topic or concept showed student weakness in specific areas of Equilibrium, Enthalpy, and Entropy.

ACS Diagnostic of Undergraduate Chemistry Knowledge (DUCK) Exam.
This exam is given to graduating seniors in Senior Seminar. In the exam administered in Spring 2014 student scores in the chemistry sub-disciplines increased in the following respective order; biological, physical, inorganic, analytical, and organic chemistry. Student correct responses were 38%, 40%, 44%, 48%, and 52% respectively.

In the exam administered in Spring 2015 student scores in the chemistry sub-disciplines increased in the following respective order; biological, analytical, physical, organic, and inorganic chemistry. Student correct responses were 38%, 46%, 47%, 49%, and 53% respectively. An item analysis of the biological chemistry questions was done. Topics or concepts students found most difficult include; Thermodynamics, Kinetics, Carbohydrates, and Metabolism.

Graduate Exit Survey.
Six students responded to the survey. The survey, aligned to the Department's PLOs, solicits graduating students' opinions on how well the Department is achieving its PLOs. They were asked to respond as: Extremely Well, Very Well, Adequately Well, Not Very Well, or Not at All. PLO 1, then worded as, "Demonstrate a conceptual understanding and integration of the fundamentals in organic, analytical, physical, inorganic, and biological chemistry," was subdivided into the five sub-disciplines of

chemistry listed. Of the possible 30 responses for PLO 1, 4 were Extremely Well, 18 were Very Well, 6 were Adequately Well, and 2 were Not Very Well.

PLOs 2 – 6 of the possible 30 responses, 13 were Extremely Well, 11 were Very well, 5 were Adequately Well, and 1 non-response.

See Appendix II-E for the Graduate Exit Survey student responses. See Exhibit V page 75 for the Department's Assessment of Student Learning Report 2015-2016.

3. Graduate Satisfaction

The Department uses its Graduate Exit Survey to measure Graduate Satisfaction. Please refer to Graduate Exit Survey results discussed in the preceding Section.

F. Advisory Committee(s)

The Department's External Advisory Committee is comprised of seven members whose occupations span Education, Higher Education, Industry, and Industry Advocacy Groups. The Advisory Committee has since 2012 met annually in the spring semester. The Department draws up the agenda for each meeting that includes items it wishes to discuss. There have been at least two faculty members in attendance in each of the meetings.

2012. Members of the committee expressed their observation of graduates' general weakness in writing and knowledge of statistics. The Committee was informed that CHEM 350 (Junior Seminar) taken by all chemistry majors serves to develop both written and oral communication skills. The Department in its advising Option B students now suggests courses to include ENGL 112 (Technical Writing) and MATH 222 (Elementary Statistics for Math and Natural Science).

2014. The issue of internships for our students with local chemical companies was discussed. The committee recommended that the informal arrangements for such internships remain in place rather than trying to forge formal arrangements between the University and the companies. There was a general discussion on fees charged for the commercial use of instrumentation.

2015. The Reaffirmation of Accreditation Visit was discussed in light of members of the committee intending to participate in the Department/Program Advisory Committees meeting with the site visitors. Issues discussed included the University's Vision, Mission, and the Department's Program learning Outcomes. The new ACS Committee on Professional Training guidelines were discussed.

2016. The members were thanked for their participation in Reaffirmation of Accreditation Visit: April 13 – 15, 2015. Recruitment strategies and activities were discussed. Members were informed of the current scholarships available for chemistry majors. The industrial chemists on the committee commended the Applied Chemistry curriculum for its interesting course offerings.

See Exhibit VI page 81. Members of the External Advisory Committee.
See Exhibit VII page 83. Chemistry Scholarships

G. Program Strengths and Weaknesses

One of our greatest strengths is the program's American Chemical Society, ACS accreditation. In the state of West Virginia only four baccalaureate programs have this accreditation. The American Chemical Society, headquartered in Washington, D.C., is the largest scientific society in the world with nearly 160,000 members. The ACS Committee on Professional Training promotes excellence in chemistry education by setting standards that include faculty and staff, infrastructure, curriculum, and research.

Another strength of the Department is the wide-ranging research opportunities the faculty provide our students. All three options require at least 3 credit hours of Directed Student Research which approximates to nine hours a week in the research laboratory. The faculty engages students in extra-curricular research such as Research Rookies, NASA Research Scholars, and Summer Undergraduate Research Experience, SURE. The Department has state-of-the-art instrumentation on which students gain hands-on experience. Faculty research interests include: acid mine drainage; water remediation; soil remediation; artificial photosynthesis (nanotechnology); chemical education; water analysis; organic synthesis of natural products; polymer synthesis; synthesis of organometallic compounds for chemotherapy; microfluidics; and microwave-assisted organic synthesis. This provides students with a variety of research areas to choose from. Exhibit VIII page 85, lists the 2014-2016 student research presentations.

The Student Members of American Chemical Society (SMACS), the Student Chapter of the ACS at WVSU, is very active and has done extensive outreach and community service. This student organization welcomes all majors, but is mainly comprised of chemistry, chemistry education and biology majors. Activities have included science demonstrations at local area schools, participation in hosting the James Brimhall Science Bowl (a high school science competition held annually at WVSU), hosting Red Cross blood drives, and providing Christmas gifts for those in need.

The ACS selects Student Chapters to receive special recognition based on their programs and activities as reported in their chapter annual reports. Awards are classified as outstanding, commendable and honorable mention. Student Chapters that do not qualify for these awards receive a certificate of achievement. The ACS also recognizes student chapters who have shown outstanding commitment to incorporating green chemistry into their annual activities with the Green Chemistry Student Chapter Award.

SMACS at WVSU has in this review period received four Outstanding Chapter Ratings and one Commendable. SMACS in this review period received five the Green Chemistry Student Chapter Awards. Exhibit IX page 89 lists the SMACS ACS chapter ratings and awards during this review period, and lists the Chapter's activities in AY 2013-2014, during with it received an "Outstanding Chapter" rating.

Weaknesses

Assessment has been a major weakness during the review period. The initial program learning outcomes were inadequate, and the initial assessment plan was overly ambitious. Under the plan, assessment was to be done for every student, at every assessment point, all the time. With nine assessment points and 12 assessment instruments this was too much to handle. However, with recently instituted institutional guidance, and a more manageable plan, the Department's assessment activities should improve. The Department lacks data on employer satisfaction of our graduates.

SECTION III: VIABILITY

A. Program Enrollment

During the review period the program enrollment dropped from a high of 52 majors in 2011 – 2012 to a low of 36 in 2012 – 2013, and stabilized at about 40 during 2014 – 2016. This parallels the drop in enrollment experienced by the College of Natural Sciences and Mathematics.

The program enrollment data is tabulated in Appendix III-A.

B. Course Enrollment

Course enrollment in the General Chemistry sequence (CHEM 105, 106, 107 and 108) has followed the general trend of showing a dip and low in 2012 – 2013, and then rising back in 2015 - 2016 to the 2011 – 2012 levels. The reason for the drop in enrollment observed in 2012 – 2013 is unclear. The highest enrollment numbers for all the courses in the General Chemistry sequence was observed in 2014 – 2015.

Course enrollment in the Organic Chemistry I lecture and lab (CHEM 205 and 207) and Organic Chemistry II lecture and lab (CHEM 206 and 208) showed differing trends. The Organic Chemistry I lecture and lab enrollment decreased 2011 – 2012 through 2013 – 2014. The low in 2013 – 2014 can be attributed to the previous year's low in the General Chemistry sequence. The highest enrollment was observed in 2014 – 2015, and the 2015 – 2016 enrollment was lower than 2011 – 2012. The Organic II lecture and lab enrollment was stable 2011 – 2012 through 2014 – 2015 and showed a high in 2015 -2016.

The General and Organic Chemistry courses serve as cognates for several programs and the trends observed include trends in enrollment in those programs.

Course enrollments in the upper-level 300 and 400 level courses – taken by chemistry majors only - have been a reflection of the number of chemistry majors nearing graduation. CHEM 331 (Biochemistry) has over this review period had the highest enrollment, this attributed to its being a cognate course for the biology majors in the Pre-Medical and Biomedical Sciences.

See Appendix III-B for Course Enrollment data. .

C. Enrollment Projections

Program enrollment appears to have stabilized at about 40 majors over the past four years. However, with actions by the University, the College of Natural Sciences and Mathematics, and the Department, we anticipate program enrollment will increase. The University has over the past few years instituted an aggressive marketing/branding strategy aimed at enhancing WVSUs image in the region. There has been a renewed focus on enrollment management, and new recruiting and retention initiatives. STEM recruiting initiatives that include early enrollment classes in area high schools are being pursued. College and Department activities such as hosting Brimhall Science Bowl, You Be a Chemist and Chemistry Olympiad all serve to bring potential students on the campus and serve as recruiting tools.

D. Cost Analysis

The Departmental Cost of Instruction (DCI) encompasses two components: (1) departmental cost to offer the major and (2) departmental cost to offer courses in the department. To determine the departmental cost to offer the major, calculations were done to generate the program cost per student in the major and cost per graduate. In this cost analysis we only considered salaries, including fringe benefits.

$$\text{Cost per student in major} = \frac{\text{2015 - 2016 program faculty salary}}{\text{Average number of majors 2011 - 2016}}$$

$$\text{Cost per graduate} = \frac{\text{2015 - 2016 program faculty salary}}{\text{Average number of graduates 2011 - 2016}}$$

The total salary including fringe benefits for Chemistry faculty during the 2015–2016 year of the review period was $419,772. Dividing by the average number of (unduplicated) majors in the degree program annually, which is 41.2, the *cost per major* is calculated to be $10,189. To calculate the program *cost per graduate*, the numerator remains the same but the denominator used is the average number of annual program graduates for the 2011–2016 period, which was found to be 2.6; thus the Chemistry cost per graduate was determined to be $161,451.

$$\text{Cost of courses offered in the program} = \frac{\text{2015 - 2016 program faculty salary}}{\text{Average SCH produced by program 2011 - 2016}}$$

The cost of offering courses in the program for all students is calculated using the same numerator; the denominator is the average number of student credit hours produced for the academic years 2011–2016. Aggregating fall and spring terms, there was an average of 1,832 credit hours associated with courses taken by both majors and non-majors during this period. Based on these numbers, the *cost per credit hour* (CPCH) in the program is $229.

The Facilities and Administrative cost (non-instructional operational cost) is also computed using the total faculty compensation for 2015–2016; in calculating this value, it is multiplied by the federal indirect rate of 56.9 percent or .569, which is a measure that is used to determine the cost of operation for grant administration. The *Chemistry Facilities and Administrative cost* (non–instructional cost) is therefore $419,772 × 0.569 = $238,850.

E. Service Courses

General Education

The Department of Chemistry offers CHEM 100 (Consumer Chemistry) as a General Education course. In addition to the regular in-class lectures, CHEM 100 is also offered as Web-80 and Web-100 courses. The CHEM 100 is a popular course with at least six sections offered every fall and spring semesters and two sections in the summer semester. A new General Education course, CHEM 132 (Introductory Environmental Chemistry) was approved by EPC in spring 2016 and will be offered in 2016 – 2017.

Support Courses
The Department of Chemistry offers the required content specialization courses for students pursuing the Bachelor of Science in Education degree in Chemistry, Biology and General Science. Depending on the concentration these range from 11 to 28 credit hours. The Science Capstone CHEM 459 (Inquiry-Based Research for Education Majors), was developed and adopted during this review period to replace the previous capstone CHEM 460 (Directed Student Research).

The Department offers cognate and elective courses for the Biology major, the Mathematics major, the Computer Science major, Pre-Engineering major, Pre-nursing major, and the Biotechnology graduate program. The General Chemistry sequence (CHEM 105, 106, 107, 108) and the Organic Chemistry sequence (CHEM 205, 206, 207, 208) typically contain a high volume of non-chemistry majors most of whom are Biology majors. The Department's graduate courses Environmental Chemistry, Advanced Organic Chemistry, Biochemistry, and Biochemistry lab (CHEM 512, 525, 531 and 533) have seen a total enrollment of 21 students during this review period.

The Service Courses are listed in Appendix III-E.

F. Off-Campus Courses

The Department has not offered any off campus courses.

G. Articulation Agreements

The Department does not have any articulation agreements.

SECTION IV: NECESSITY

A. Similar Programs

There are three other institutions of higher learning in close proximity to WVSU offering a BS Chemistry degree; Marshall University, University of Charleston, and West Virginia University Institute of Technology. The programs in the Departments at WVSU and Marshall University have the distinction of having ACS accreditation.

The majority of the students in the chemistry program commute from within Kanawha and surrounding counties. Our central location of being within the greater Charleston area provides a convenient commute for the students. The University of Charleston is similarly located within the greater Charleston area, however WVSU is much more affordable, offers a wider array of courses and research opportunities, which includes hands-on experience with state-of-the-art instrumentation.

The faculty at Marshall have active research programs; the Department there has a graduate program. However, the smaller size of the WVSU's Chemistry faculty allows a closer student relationship to faculty facilitating the students' involvement in research.

B. Post-Program Placement

Of the 13 students who graduated in this review period, three are using their degrees directly within the state. Two are working in the chemical industry while the third works for a government lab. Three used their degrees for admission into graduate, dental and pharmacy schools.

Appendices

Appendix II-A
Curriculum

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option A)	Total number of credit hours required for graduation: 129-134
Professional society that may have influenced the program offering and requirements: American Chemical Society	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I	3	CHEM 302 Physical Chemistry II	3	MATH 206 Analytic	4	GE 100	3
CHEM 106 General Chem. II	3	CHEM 304 Physical Chem. Lab II	2	Geometry and Calculus I		GE 200	3
CHEM 107 General Chem. Lab I	2	CHEM 331 Biochemistry	3	MATH 207 Analytic	4	HIST 201 or 201	3
CHEM 108 General Chem. Lab II	2	CHEM 413 Inorganic Chemistry Lab	2	Geometry and Calculus II		International Perspectives	6
CHEM 202 Computer Chem.	2	CHEM 462 Directed Student	3	MATH 208 Analytic	4		
CHEM 205 Organic Chem. I	3	Research		Geometry and Calculus III		COMM 100	3
CHEM 206 Organic Chem. II	3			PHYS 203 General Physics	1	ENGL 101 & 102	6
CHEM 207 Organic Chem. Lab I	2	One course from:		Lab I		MATH *	3
CHEM 208 Organic Chem. Lab II	2	CHEM 425 Adv. Organic Chem.	3	PHYS 204 General Physics	1	HHP 122 or 157	2
CHEM 211 Intro. Analytical Chem.	4	CHEM 461 Directed Student	2	Lab II			
CHEM 301 Physical Chem.	3	Research				ENGL 150	3
CHEM 303 Physical Chem. Lab I	2	CHEM 462 Directed Student	3	AND		Fine Arts	6
CHEM 350 Junior Seminar	1	Research		PHYS 201 General Physics I	4	Natural Sciences **	6-8
CHEM 411 Inorganic Chem.	3			PHYS 202 General Physics II	4	American Traditions	3
CHEM 416 Instrumental Analysis	3					Social Structures	3
CHEM 418 Instrum. Analysis Lab	2			OR			
CHEM 429 Spectroscopic Methods	3			PHYS 231 Physics for Scientists and Engineers I	4	Electives	5
CHEM 450 Senior Seminar	1			PHYS 232 Physics for Scientists and Engineers II	4	* Option A Program fulfills General Education Math requirement of 3 hours.	
						** Option A Program fulfills General Education Natural Science requirement of 3 hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**15-16**	Total Cognate Hours:	**22**	Total Gen. Ed./Elective Hours:	**50-52**

Note: AY 2011-2012

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option A)	Total number of credit hours required for graduation: 128
Professional society that may have influenced the program offering and requirements: American Chemical Society	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I	3	CHEM 302 Physical Chemistry II	3	MATH 206 Analytic	4	NSM 101	1
CHEM 106 General Chem. II	3	CHEM 304 Physical Chem. Lab II	2	Geometry and Calculus I		GE 100	3
CHEM 107 General Chem. Lab I	2	CHEM 331 Biochemistry	3	MATH 207 Analytic	4	GE 200	3
CHEM 108 General Chem. Lab II	2	CHEM413 Inorganic Chemistry Lab	2	Geometry and Calculus II		HIST 201 or 201	3
CHEM 202 Computer Chem.	2	CHEM 462 Directed Student	3	MATH 208 Analytic	4	International Perspectives	6
CHEM 205 Organic Chem. I	3	Research		Geometry and Calculus III			
CHEM 206 Organic Chem. II	3			PHYS 203 General Physics	1	COMM 100	3
CHEM 207 Organic Chem. Lab I	2	One course from:		Lab I		ENGL 101 & 102	6
CHEM 208 Organic Chem. Lab II	2	CHEM 425 Adv Organic Chem.	3	PHYS 204 General Physics	1	MATH *	3
CHEM 211 Intro. Analytical Chem.	4	CHEM 462 Directed Student	3	Lab II		HHP 122 or 157	2
CHEM 301 Physical Chem.	3	Research					
CHEM 303 Physical Chem. Lab I	2			AND		ENGL 150	3
CHEM 350 Junior Seminar	1			PHYS 201 General Physics I	4	Fine Arts	6
CHEM 411 Inorganic Chem.	3			PHYS 202 General Physics II	4	Natural Sciences **	6-8
CHEM 416 Instrumental Analysis	3					American Traditions	3
CHEM 418 Instrum. Analysis Lab	2			OR		Social Structures	3
CHEM 429 Spectroscopic Methods	3			PHYS 231 Physics for	4		
CHEM 450 Senior Seminar	1			Scientists and Engineers I			
				PHYS 232 Physics for	4	* Option A Program fulfills	
				Scientists and Engineers II		General Education Math	
						requirement of 3 hours.	
						** Option A Program fulfills	
						General Education Natural	
						Science requirement of 6	
						hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**16**	Total Cognate Hours:	**22**	Total Gen. Ed./Elective Hours:	**51-53**

Note: AY 2012 – 2013 through AY 2015 – 2016

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option A)	Total number of credit hours required for graduation: 120
Professional society that may have influenced the program offering and requirements: American Chemical Society	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I	3	CHEM 302 Physical Chemistry II	3	MATH 206 Analytic	4	First Year Experience	3
CHEM 106 General Chem. II	3	CHEM 304 Physical Chem. Lab II	2	Geometry and Calculus I		Written Communication	6
CHEM 107 General Chem. Lab I	2	CHEM 331 Biochemistry	3	MATH 207 Analytic	4	Oral Communication	3
CHEM 108 General Chem. Lab II	2	CHEM413 Inorganic Chemistry Lab	2	Geometry and Calculus II		Math*	3-4
CHEM 202 Computer Chem.	2	CHEM 462 Directed Student	3	MATH 208 Analytic	4	Scientific Reasoning	3
CHEM 205 Organic Chem. I	3	Research		Geometry and Calculus III			
CHEM 206 Organic Chem. II	3			PHYS 203 General Physics	1	Arts	3
CHEM 207 Organic Chem. Lab I	2	One course from:		Lab I		Humanities	3
CHEM 208 Organic Chem. Lab II	2	CHEM 425 Adv Organic Chem.	3	PHYS 204 General Physics	1	Natural Sciences	3-4
CHEM 211 Intro. Analytical Chem.	4	CHEM 462 Directed Student	3	Lab II		Social Science	3
CHEM 301 Physical Chem.	3	Research				International Perspectives	3
CHEM 303 Physical Chem. Lab I	2			AND		Histories	3
CHEM 350 Junior Seminar	1			PHYS 201 General Physics I	4	Wellness	2
CHEM 411 Inorganic Chem.	3			PHYS 202 General Physics II	4		
CHEM 416 Instrumental Analysis	3						
CHEM 418 Instrum. Analysis Lab	2			OR		Electives	1-4
CHEM 429 Spectroscopic Methods	3			PHYS 231 Physics for	4		
CHEM 450 Senior Seminar	1			Scientists and Engineers I			
				PHYS 232 Physics for	4	* Option A Program fulfills	
				Scientists and Engineers II		General Education Math	
						requirement of 4 hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**16**	Total Cognate Hours:	**22**	Total Gen. Ed./Elective Hours:	**39-45**

Note: AY 2015 – 2016 Spring Revision

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option B)	Total number of credit hours required for graduation: **126-128**
Professional society that may have influenced the program offering and requirements:	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I	3	CHEM 302 Physical Chemistry II	3	MATH 120 College Algebra	3	GE 100	3
CHEM 106 General Chem. II	3			MATH 102 Plane	3	GE 200	3
CHEM 107 General Chem. Lab I	2	8 hours from:		Trigonometry		HIST 201 or 201	3
CHEM 108 General Chem. Lab II	2	CHEM 304 Physical Chem. Lab II	2	MATH 206 Analytic	4	International Perspectives	6
CHEM 202 Computer Chem.	2	CHEM 312 Environmental Chem.	3	Geometry and Calculus I			
CHEM 205 Organic Chem. I	3	CHEM 331 Biochemistry	3	MATH 207 Analytic	4	COMM 100	3
CHEM 206 Organic Chem. II	3	CHEM 333 Biochemistry Lab	2	Geometry and Calculus II		ENGL 101 & 102	6
CHEM 207 Organic Chem. Lab I	2	CHEM 413 Inorganic Chemistry Lab	2	PHYS 203 General Physics	1	MATH *	3
CHEM 208 Organic Chem. Lab II	2	CHEM 425 Adv Organic Chem.	3	Lab I		HHP 122 or 157	2
CHEM 211 Intro. Analytical Chem.	4	CHEM 460 Directed Student	1	PHYS 204 General Physics	1		
CHEM 301 Physical Chem.	3	Research		Lab II		ENGL 150	3
CHEM 303 Physical Chem. Lab I	2	CHEM 461 Directed Student	2			Fine Arts	6
CHEM 350 Junior Seminar	1	Research		AND		Natural Sciences **	6-8
CHEM 411 Inorganic Chem.	3	CHEM 462 Directed Student	3	PHYS 201 General Physics I	4	American Traditions	3
CHEM 416 Instrumental Analysis	3	Research		PHYS 202 General Physics II	4	Social Structures	3
CHEM 418 Instrum. Analysis Lab	2						
CHEM 429 Spectroscopic Methods	3			OR			
CHEM 450 Senior Seminar	1			PHYS 231 Physics for Scientists and Engineers I	4	Electives	5
				PHYS 232 Physics for Scientists and Engineers II	4	* Option B Program fulfills General Education Math requirement of 3 hours.	
						** Option B Program fulfills General Education Natural Science requirement of 3 hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**11**	Total Cognate Hours:	**24**	Total Gen. Ed./Elective Hours:	**50-52**

Note: AY 2011-2012

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option B)	Total number of credit hours required for graduation: **120**
Professional society that may have influenced the program offering and requirements:	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I		CHEM 312 Environmental Chem.	3	MATH 206 Analytic	4	NSM 101	1
CHEM 106 General Chem. II		CHEM 331 Biochemistry	3	Geometry and Calculus I		GE 100	3
CHEM 107 General Chem. Lab I		CHEM 333 Biochemistry Lab	2	PHYS 203 General Physics	1	GE 200	3
CHEM 108 General Chem. Lab II		CHEM 356 Environ. Toxicology		Lab I		HIST 201 or 201	3
CHEM 202 Computer Chem.		CHEM 357 Green Chemistry	3	PHYS 204 General Physics	1	International Perspectives	6
CHEM 205 Organic Chem. I		CHEM 425 Adv Organic Chem.		Lab II			
CHEM 206 Organic Chem. II		CHEM 460 Directed Student	3			COMM 100	3
CHEM 207 Organic Chem. Lab I		Research	3	AND		ENGL 101 & 102	6
CHEM 208 Organic Chem. Lab II		CHEM 461 Directed Student	1	PHYS 201 General Physics I	4	MATH *	4
CHEM 211 Intro. Analytical Chem.		Research		PHYS 202 General Physics II	4	HHP 122 or 157	2
CHEM 301 Physical Chem.			2				
CHEM 303 Physical Chem. Lab I				OR		ENGL 150	3
CHEM 350 Junior Seminar				PHYS 231 Physics for	4	Fine Arts	6
CHEM 411 Inorganic Chem.				Scientists and Engineers I		Natural Sciences **	6-8
CHEM 416 Instrumental Analysis				PHYS 232 Physics for	4	American Traditions	3
CHEM 418 Instrum. Analysis Lab				Scientists and Engineers II		Social Structures	3
CHEM 429 Spectroscopic Methods							
CHEM 450 Senior Seminar							
						* Option B Program fulfills General Education Math requirement of 3 hours.	
						** Option B Program fulfills General Education Natural Science requirement of 6 hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**20**	Total Cognate Hours:	**14**	Total Gen. Ed./Elective Hours:	**51-53**

Note: AY 2012-2013 through AY 2015-2016

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option B)	Total number of credit hours required for graduation: **120**
Professional society that may have influenced the program offering and requirements:	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I		CHEM 312 Environmental Chem.	3	MATH 206 Analytic	4	First Year Experience	3
CHEM 106 General Chem. II		CHEM 331 Biochemistry	3	Geometry and Calculus I		Written Communication	6
CHEM 107 General Chem. Lab I		CHEM 333 Biochemistry Lab	2	PHYS 203 General Physics	1	Oral Communication	3
CHEM 108 General Chem. Lab II		CHEM 356 Environ. Toxicology		Lab I		Math*	3-4
CHEM 202 Computer Chem.		CHEM 357 Green Chemistry	3	PHYS 204 General Physics	1	Scientific Reasoning	3
CHEM 205 Organic Chem. I		CHEM 425 Adv Organic Chem.		Lab II			
CHEM 206 Organic Chem. II		CHEM 460 Directed Student	3			Arts	3
CHEM 207 Organic Chem. Lab I		Research	3	AND		Humanities	3
CHEM 208 Organic Chem. Lab II		CHEM 461 Directed Student	1	PHYS 201 General Physics I	4	Natural Sciences	3-4
CHEM 211 Intro. Analytical Chem.		Research		PHYS 202 General Physics II	4	Social Science	3
CHEM 301 Physical Chem.			2			International Perspectives	3
CHEM 303 Physical Chem. Lab I				OR		Histories	3
CHEM 350 Junior Seminar				PHYS 231 Physics for	4	Wellness	2
CHEM 411 Inorganic Chem.				Scientists and Engineers I			
CHEM 416 Instrumental Analysis				PHYS 232 Physics for	4		
CHEM 418 Instrum. Analysis Lab				Scientists and Engineers II		Electives	5-8
CHEM 429 Spectroscopic Methods							
CHEM 450 Senior Seminar							
						* Option B Program fulfills General Education Math requirement of 4 hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**20**	Total Cognate Hours:	**14**	Total Gen. Ed./Elective Hours:	**43-49**

Note: AY 2015-2016 Spring Revision

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option C)	Total number of credit hours required for graduation: **126-128**
Professional society that may have influenced the program offering and requirements:	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I	3	5 hours from:		MATH 102 Plane	3	GE 100	3
CHEM 106 General Chem. II	3	CHEM 331 Biochemistry	3	Trigonometry		GE 200	3
CHEM 107 General Chem. Lab I	2	CHEM 333 Biochemistry Lab	2	MATH 206 Analytic	4	HIST 201 or 201	3
CHEM 108 General Chem. Lab II	2	CHEM 460 Directed Student	1	Geometry and Calculus I		International Perspectives	6
CHEM 202 Computer Chem.	2	Research		BIOL 120 Fundamentals of	4		
CHEM 205 Organic Chem. I	3	CHEM 461 Directed Student	2	Biology		COMM 100	3
CHEM 206 Organic Chem. II	3	Research		BIOL 331 Human A & P I	4	ENGL 101 & 102	6
CHEM 207 Organic Chem. Lab I	2	CHEM 462 Directed Student	3	BIOL 341 Microbiology	4	MATH *	3
CHEM 208 Organic Chem. Lab II	2	Research		PHYS 203 General Physics	1	HHP 122 or 157	2
CHEM 211 Intro. Analytical Chem.	4			Lab I			
CHEM 301 Physical Chem.	3			PHYS 204 General Physics	1	ENGL 150	3
CHEM 303 Physical Chem. Lab I	2			Lab II		Fine Arts	6
CHEM 350 Junior Seminar	1					Natural Sciences **	6-8
CHEM 411 Inorganic Chem.	3			AND		American Traditions	3
CHEM 416 Instrumental Analysis	3			PHYS 201 General Physics I	4	Social Structures	3
CHEM 418 Instrum. Analysis Lab	2			PHYS 202 General Physics II	4		
CHEM 429 Spectroscopic Methods	3						
CHEM 450 Senior Seminar	1			OR		Electives	6
				PHYS 231 Physics for	4		
				Scientists and Engineers I		* Option C Program fulfills	
				PHYS 232 Physics for	4	General Education Math	
				Scientists and Engineers II		requirement of 3 hours.	
						** Option C Program fulfills	
				PLUS Choose one from:		General Education Natural	
				BIOL 332 Human A & P II	4	Science requirement of 6	
				BIOL 385 Cell Biology	4	hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**5**	Total Cognate Hours:	**33**	Total Gen. Ed./Elective Hours:	**50-52**

Note: AY 2011-2012

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option C)	Total number of credit hours required for graduation: **120**
Professional society that may have influenced the program offering and requirements:	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I	3	CHEM 331 Biochemistry	3	MATH 206 Analytic	4	NSM 101	1
CHEM 106 General Chem. II	3	CHEM 333 Biochemistry Lab	2	Geometry and Calculus I		GE 100	3
CHEM 107 General Chem. Lab I	2	CHEM 462 Directed Student	3	BIOL 120 Fundamentals of	4	GE 200	3
CHEM 108 General Chem. Lab II	2	Research		Biology		HIST 201 or 201	3
CHEM 202 Computer Chem.	2			BIOL 331 Human A & P I	4	International Perspectives	6
CHEM 205 Organic Chem. I	3			PHYS 203 General Physics	1		
CHEM 206 Organic Chem. II	3			Lab I		COMM 100	3
CHEM 207 Organic Chem. Lab I	2			PHYS 204 General Physics	1	ENGL 101 & 102	6
CHEM 208 Organic Chem. Lab II	2			Lab II		MATH **	3
CHEM 211 Intro. Analytical Chem.	4					HHP 122 or 157	2
CHEM 301 Physical Chem.	3			AND			
CHEM 303 Physical Chem. Lab I	2			PHYS 201 General Physics I	4	ENGL 150	3
CHEM 350 Junior Seminar	1			PHYS 202 General Physics II	4	Fine Arts	6
CHEM 411 Inorganic Chem.	3					Natural Sciences **	6-8
CHEM 416 Instrumental Analysis	3			OR		American Traditions	3
CHEM 418 Instrum. Analysis Lab	2			PHYS 231 Physics for	4	Social Structures	3
CHEM 429 Spectroscopic Methods	3			Scientists and Engineers I			
CHEM 450 Senior Seminar	1			PHYS 232 Physics for	4		
				Scientists and Engineers II			
						* Option C Program fulfills	
				PLUS Choose one from:		General Education Math	
				BIOL 332 Human A & P II	4	requirement of 3 hours.	
				BIOL 341 Microbiology	4		
				BIOL 385 Cell Biology	4	** Option C Program fulfills	
						General Education Natural	
						Science requirement of 6	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**8**	Total Cognate Hours:	**26**	Total Gen. Ed./Elective Hours:	**51-53**

Note: AY 2012-2013 through AY 2015-2016

APPENDIX II-A: Curriculum

Degree Program: Chemistry (Option C)	Total number of credit hours required for graduation: **120**
Professional society that may have influenced the program offering and requirements:	

Core Courses Required in Major (by course number and title)	Hours	Additional Courses Required in Major	Hours	Courses Required in Related Fields	Hours	Courses Required in General Education and Elective Hours	Hours
CHEM 105 General Chem. I	3	CHEM 331 Biochemistry	3	MATH 206 Analytic	4	First Year Experience	3
CHEM 106 General Chem. II	3	CHEM 333 Biochemistry Lab	2	Geometry and Calculus I		Written Communication	6
CHEM 107 General Chem. Lab I	2	CHEM 462 Directed Student	3	BIOL 120 Fundamentals of	4	Oral Communication	3
CHEM 108 General Chem. Lab II	2	Research		Biology		Math	3-4
CHEM 202 Computer Chem.	2			BIOL 331 Human A & P I	4	Scientific Reasoning	3
CHEM 205 Organic Chem. I	3			PHYS 203 General Physics	1		
CHEM 206 Organic Chem. II	3			Lab I		Arts	3
CHEM 207 Organic Chem. Lab I	2			PHYS 204 General Physics	1	Humanities	3
CHEM 208 Organic Chem. Lab II	2			Lab II		Natural Sciences	3-4
CHEM 211 Intro. Analytical Chem.	4					Social Science	3
CHEM 301 Physical Chem.	3			AND		International Perspectives	3
CHEM 303 Physical Chem. Lab I	2			PHYS 201 General Physics I	4	Histories	3
CHEM 350 Junior Seminar	1			PHYS 202 General Physics II	4	Wellness	2
CHEM 411 Inorganic Chem.	3						
CHEM 416 Instrumental Analysis	3			OR			
CHEM 418 Instrum. Analysis Lab	2			PHYS 231 Physics for	4	Electives	5-8
CHEM 429 Spectroscopic Methods	3			Scientists and Engineers I			
CHEM 450 Senior Seminar	1			PHYS 232 Physics for	4		
				Scientists and Engineers II		* Option C Program fulfills General Education Math requirement of 4 hours.	
				PLUS Choose one from:			
				BIOL 332 Human A & P II	4	** Option C Program fulfills	
				BIOL 341 Microbiology	4	General Education Natural	
				BIOL 385 Cell Biology	4	Sciences requirement of 4 hours.	
Total Required Major Hours:	**44**	Total Additional Major Hours:	**8**	Total Cognate Hours:	**26**	Total Gen. Ed./Elective Hours:	**43-49**

Note: AY 2015-2016 Spring Revision

Appendix II-B
Faculty Data Sheets

APPENDIX II-B: Faculty Data

Name: J. M. Chatfield	Rank: Professor
Status: ☒ Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: Ph.D.
Degree Conferred by: Oregon State University, Dept. of Botany	Date Degree Received: 1986
Area of Specialization: Plant Physiology with minors in Genetics and Biochemistry	

Professional registration/licensure:
Years of employment at present institution: 23
Years of employment in higher education: 31
Years of related experience outside higher education: 0

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT
	Did not teach in last two years	

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

(C). Identify your professional development activities during the past five years. **None**

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years. **None**

(E). Indicate any other activities that have contributed to effective teaching. **None**

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

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

1) Learning and Teaching Biological & Agricultural Science Online: Increasing Success through Comprehensive Training, Development, and Research. $499,000. USDA, NIFA. Mark Chatfield, Bobbie Seyedmonir & Mehdi Seyedmonir (director). 09-2013 to 08-2017

2) Exposing graduate students to worldwide genomic impact in crop improvement through CGIAR research. $150,000.PI- Dr. Mark Chatfield, Co-PI – Umesh Reddy and Padma Nimmakayala 09-2012 to 08-2013.

2)

APPENDIX II-B: Faculty Data

Name: Dr. Micheal Fultz	Rank: Associate Professor
Status: ☒ Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: Ph.D.
Degree Conferred by: Indiana University	Date Degree Received: July 2009
Area of Specialization: Organic Chemistry	

Professional registration/licensure: 0
Years of employment at present institution: 7
Years of employment in higher education: 7
Years of related experience outside higher education: 0

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT
2016/Spring	CHEM 206 Organic Chemistry II	23
2016/Spring	CHEM 208 Organic Chemistry II Laboratory	17
2016/Spring	CHEM 450 Senior Seminar	1
2016/Spring	BT 599 Spectroscopic Methods	6
2015/Fall	NSM 101 Freshman Experience	26
2015/Fall	NSM 101 Freshman Experience	29
2015/Fall	CHEM 205 Organic Chemistry I	24
2015/Fall	CHEM 207 Organic Chemistry I Laboratory	13
2015/Fall	CHEM 207 Organic Chemistry I Laboratory	9
2015/Fall	CHEM 350 Junior Seminar	5
2015/Spring	CHEM 100 Consumer Chemistry	21
2015/Spring	CHEM 206 Organic Chemistry II	16
2015/Spring	CHEM 208 Organic Chemistry II Laboratory	14
2015/Spring	CHEM 450 Senior Seminar	3
2015/Spring	CHEM 429 Spectroscopic Methods	2
2014/Fall	CHEM 100 Consumer Chemistry	23
2014/Fall	CHEM 205 Organic Chemistry I	25
2014/Fall	CHEM 207 Organic Chemistry I Laboratory	11
2014/Fall	CHEM 207 Organic Chemistry I Laboratory	9
2014/Fall	CHEM 350 Junior Seminar	4

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

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

2012, 2014 and 2016 Kanawha Valley Section of the American Chemical Society Chair-Elect
2013 and 2015 Kanawha Valley Section of the American Chemical Society Chair
2013 – Present Kanawha Valley Section of the American Chemical Society Alternate Councilor
2016 – ACS National Committee on Professional Relations and Communications

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

2015 – 2016 WVSU Faculty Service Award
2015 – ACS Division of Education Passer Award
2013 – WVSU FACET Teaching Award

(E). Indicate any other activities that have contributed to effective teaching.

2013 – ACS Division of Education member
Hosted students in my research laboratory supported through Research Rookies, NASA Scholars, grants, or obtaining research credit. These students helped to the acceptance of 20 papers at National ACS meetings (243rd, 245th, 247th, 249th, and 251st National Meetings) as well as other at local or regional meetings.

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

Fultz, Micheal, W.; Rearrangements and Fragmentations. In Carbocation Chemistry; Li, J. J. Ed. Taylor and Francis: Boca Raton, FL, 2016, Chapter 6.

Fultz, Micheal, W.; Rhodium Catalyzed C-H Activation. In C-H Activation for Functionalization; Li, J. J. Ed. Taylor and Francis: Boca Raton, FL, 2015, Chapter 4.

Fultz, Micheal, W.; Rollyson, William, Pyrazines and Quinoxalines. In Heterocyclic Chemistry in Drug Discovery; Li, J. J. Ed. Wiley and Sons: New York, 2013, Chapter 10.

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

National Science Foundation "Sulfonation of phenyl dicarboxylic acids," Micheal Fultz (PI), 2015, $25,000

West Virginia Idea network for Biomedical Research "Synthesis of Biologically Active Sulfur Containing Natural products" – West Virginia State University" Micheal Fultz (PI), 2014, $44,275

National Science Foundation "STEP to Success," West Virginia State University" Kumara Jayasuira, Naveed Zaman, Xiaohong Zhang, Upali Karunthilake, Micheal Fultz (Co-PI), 2014, $500,000

United States Department of Agriculture "Bioengineering the carboxylate platform in thermophilic anaerobic microbiomes" David Huber, Marek Krasnansky, Sridhar Malkaram, Micheal Fultz (Co-PI), 2014, $288,873.

Department of Defense "Acquisition of HPLC-Mass Spectrometer**"** – West Virginia State University" Micheal Fultz (PI), 2013, $324,893

West Virginia Research Trust Fund "Acquisition of 400 MHz NMR – West Virginia State University" R. Charles Byers (PI), Micheal Fultz, Genia Sklute, Gerald Hankins, Ernest Sekabunga, Katherine Harper, 2011, $100,000

Editor's note: Dr. Fultz listed five more externally funded grants during this review period. These totaled $ 126,000

APPENDIX II-B: Faculty Data

Name: Thomas F. Guetzloff	Rank: Professor
Status: X Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: Ph.D.
Degree Conferred by: South Dakota State University	Date Degree Received: May 1996
Area of Specialization: Analytical/Environmental Chemistry	

Professional registration/licensure:	
Years of employment at present institution:	17
Years of employment in higher education:	22
Years of related experience outside higher education:	0

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT

2016/Spring	CHEM 100 Consumer Chemistry Web-100	22
2016/Spring	CHEM 100 Consumer Chemistry Web-80	18
2016/Spring	CHEM 416 Instrumental chemistry	9
2016/Spring	CHEM 418 Instrumental Chemistry Lab	9
2015/Fall	CHEM 100 Consumer Chemistry Web-100	21
2015/Fall	CHEM 100 Consumer Chemistry Web-80	19
2015/Fall	CHEM 211 Analytical Chemistry	5
2015/Fall	CHEM 105 General Chemistry	17
2015/Spring	CHEM 100 Consumer Chemistry Web-100	22
2015/Spring	CHEM 100 Consumer Chemistry Web-80	21
2015/Spring	CHEM 416 Instrumental chemistry	5
2015/Spring	CHEM 418 Instrumental Chemistry Lab	5
2014/Fall	CHEM 100 Consumer Chemistry Web-100	20
2014/Fall	CHEM 100 Consumer Chemistry Web-80	19
2014/Fall	CHEM 211 Analytical Chemistry	5
2014/Fall	CHEM 105 General Chemistry	13

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

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

Invited peer reviewer of the Journal of Soil Science Society of America since 2005
Invited peer reviewer of the Journal of Environmental Quality since 2007
Invited peer reviewer of the Journal of Chemical Education since 2005
Moodle training for online courses, 2015
Developing remedial bridge courses in mathematics and English

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

For the last five years the student group that I co-advise has won both the Commendable rating and Green Chemistry award from the American Chemical Society.

(E). Indicate any other activities that have contributed to effective teaching.

•**Guetzloff, T.F., Seyedmonir, B. "**A Good Way to Transition to an online Course" American Chemical Society National Meeting, Dallas, Spring 2014. "picked to be presented at special social hour presentation"
•**Guetzloff, T.F.,** Morris B, Abdalla, K., Guetzloff, M., Fultz M. **"**Microwave synthesis of N-phenyl succinimides and adaptation in organic chemistry laboratory" American Chemical Society National Meeting, Dallas, Spring 2014.
•**Guetzloff, T.F.,** Morris B#, Fultz M. **""**Synthesis Strategy for A Malemide" American Chemical Society National Meeting, San Diego, Spring 2012.
•Abdalla, K., **Guetzloff, T.F.** "Malemide Synthesis" 2nd annual sure Symposium, Summer 2011**.**

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

Guetzloff, T.F.,; Shell, T.; Shell, J.; Poole, K.; 2011 "Microwave-Assisted Synthesis of *N*-Phenylsuccinimide" Journal of Chemical Education., 88, 1439-1441, August 4 2011

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

APPENDIX II-B: Faculty Data

Name: Elizabeth A. Keville	Rank: Adjunct
Status: ☐ Full-time ☐ Part-time ✠ Adjunct ☐ Graduate Asst.	Highest Degree Earned: M.S.
Degree Conferred by: University of Maryland at Baltimore	Date Degree Received: May 2001
Area of Specialization: Toxicology	

Professional registration/licensure: None
Years of employment at present institution: 7.5 years
Years of employment in higher education: 8.5 years
Years of related experience outside higher education: 36 years

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT

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

(C). Identify your professional development activities during the past five years. None

(D). List awards/honors (including invitations to speak in your area of expertise) or special recognitions in last five years. None

(E). Indicate any other activities that have contributed to effective teaching.

Development of competence with specific technology used in the on-line portions of the lecture courses (MS PowerPoint, Moodle, Sakai, etc.); development of competence with laboratory techniques used in the undergraduate chemistry laboratories, to assist the faculty teaching the labs and to allow for "covering" labs in the absence of the assigned faculty member (CHEM 100, 101, 107, 108, 201, 207, 208, 211, 303, 413).

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

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

Served as Compliance Expert/Subject Matter Expert on research project/clinical trial of a combination product in development for the U.S. military which required U.S. FDA approval.

APPENDIX II-B: Faculty Data

Name: Dr. Sharon Molnar	Rank: Associate Professor
Status: ☒ Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: Ph.D.
Degree Conferred by: Virginia Tech	Date Degree Received: December 1996
Area of Specialization: Inorganic Chemistry	

Professional registration/licensure: 0
Years of employment at present institution: 18
Years of employment in higher education: 18
Years of related experience outside higher education: 3

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT
2016/Spring	CHEM 106 General Chemistry II	15
2016/Spring	CHEM 108 General Chemistry II Laboratory	14
2016/Spring	CHEM 100 Consumer Chemistry	22
2016/Spring	CHEM 100 Consumer Chemistry	9
2015/Fall	CHEM 105 General Chemistry I	17
2015/Fall	CHEM 107 General Chemistry I Laboratory	17
2015/Fall	CHEM 411 Inorganic Chemistry	1
2015/Fall	CHEM 413 Inorganic Chemistry Laboratory	1
2015/Spring	CHEM 106 General Chemistry II	21
2015/Spring	CHEM 108 General Chemistry II Laboratory	17
2015/Spring	CHEM 100 Consumer Chemistry	22
2015/Spring	CHEM 100 Consumer Chemistry	18
2014/Fall	CHEM 105 General Chemistry I	26
2014/Fall	CHEM 107 General Chemistry I Laboratory	20
2014/Fall	CHEM 411 Inorganic Chemistry	3
2014/Fall	CHEM 413 Inorganic Chemistry Laboratory	1

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

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

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

2016 –Invited Talk: "EMISSION STUDY OF $Ir^{III}Cp^*$ compounds and synthesis of Ru^{II}-$Ir^{III}Cp^*$ bimetallic complex designed for anticancer activity." *251st ACS National Meeting*. San Diego, CA.

(E). Indicate any other activities that have contributed to effective teaching.

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

Payne, Hannah ; Molnar, Sharon M. ; Fultz, Micheal, W.; Rearrangements and Fragmentations. In Carbocation Chemistry; Li, J. J. Ed. CRC Press, Taylor and Francis Group: Boca Raton, FL, 2016, Chapter 6. ISBN: 978-1-4987-2906-6

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

West Virginia IDeA Network for Biomedical Research Excellence (WV-INBRE) Subaward from NIH 2P20GM103434, "Ru^{II} Metallic Polypyridyl Systems for Photodynamic Anti-Cancer Therapy" Sharon Molnar (PI), 2016, $46,200

National Science Foundation "CLiPS WVSU Statement of Work," West Virginia State University" Micheal Fultz (Co-PI), Sharon Molnar (Co-PI), 2015, $25,000

APPENDIX II-B: Faculty Data

Name: Anthony Moncrief	Rank: Instructor
Status: ☒ Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: M.S.
Degree Conferred by: University of Kentucky	Date Degree Received: December 2005
Area of Specialization: Analytical Chemistry	

Professional registration/licensure:	
Years of employment at present institution:	9
Years of employment in higher education:	10
Years of related experience outside higher education:	0

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT
2016/Spring	CHEM 106 General Chemistry II	24
2016/Spring	CHEM 331 Biochemistry I	18
2016/Spring	CHEM 333 Biochemistry Lab	9
2015/Fall	CHEM 105 General Chemistry I	24
2015/Fall	CHEM 107 General Chemistry Lab I	17
2015/Fall	CHEM 107 General Chemistry Lab I	16
2015/Spring	CHEM 106 General Chemistry II	16
2015/Spring	CHEM 331 Biochemistry I	23
2015/Spring	CHEM 333 Biochemistry Lab	8
2014/Fall	CHEM 105 General Chemistry I	24
2014/Fall	CHEM 107 General Chemistry Lab I	19
2014/Fall	CHEM 107 General Chemistry Lab I	17

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

I have a degree in analytical chemistry which directly relates to all of the above classes except for G Ed 101. G Ed 101 is a university course that can be taught by any willing faculty.

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

Obtained candidacy for Ph.D. in analytical chemistry. Attended and presented at professional conferences (Pittconn 2013) State of West Virginia Graduate Student Science colloquium)

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

Invitation to speak at the Pittsburgh Conference (Pittconn 2013)
Invitation to speak at the State of West Virginia Graduate Student Science colloquium (2014)

(E). Indicate any other activities that have contributed to effective teaching.

Graduate course taken on scientific reflective and inquiry based research instruction (West Virginia University)

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

Ramakrishnan, B., Moncrief, A.J., Davis, T.A. et al. Glycoconj J (2013) 30: 835. doi:10.1007/s10719-013-9488-4

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

N/A as principle investigator, active participant on microfluidics based NSF grant and its corresponding renewal.

APPENDIX II-B: Faculty Data

Name: Sundar Naga	Rank: Professor
Status: ☒ Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: Ph. D.
Degree Conferred by: University of Maine, Orono, ME	Date Degree Received: May 1987
Area of Specialization: Physical Chemistry	

Professional registration/licensure:	-
Years of employment at present institution:	25
Years of employment in higher education:	36
Years of related experience outside higher education:	

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT
2016/Spring	CHEM 105 General Chemistry I	29
2016/Spring	CHEM 107 General Chemistry Laboratory I	14
2016/Spring	CHEM 107 General Chemistry Laboratory I	14
2016/Spring	CHEM 202 Computer Chemistry	9
2015/Fall	CHEM 106 General Chemistry II	17
2015/Fall	CHEM 108 General Chemistry Laboratory II	6
2015/Fall	CHEM 108 General Chemistry Laboratory II	4
2015/Fall	CHEM 301 Physical Chemistry I	4
2015/Fall	CHEM 303 Physical Chemistry Laboratory I	4
2015/Spring	CHEM 105 General Chemistry I	26
2015/Spring	CHEM 107 General Chemistry Laboratory I	20
2015/Spring	CHEM 107 General Chemistry Laboratory I	7
2015/Spring	CHEM 202 Computer Chemistry	5
2015/Spring	CHEM 302 Physical Chemistry II	1
2015/Spring	CHEM 304 Physical Chemistry Laboratory II	1
2014/Fall	CHEM 106 General Chemistry II	16
2014/Fall	CHEM 108 General Chemistry Laboratory II	10
2014/Fall	CHEM 108 General Chemistry Laboratory II	4
2014/Fall	CHEM 301 Physical Chemistry I	3
2014/Fall	CHEM 303 Physical Chemistry Laboratory I	3

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

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

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

(E). Indicate any other activities that have contributed to effective teaching.

Prepared and posted online a large series of what are called “textbook supplements” aimed at helping students thoroughly understand the materials to be mastered by providing information missing in the corresponding textbooks for the following courses: Chem 105 (General Chemistry I), Chem 106 (General Chemistry II), Chem 301(Physical Chemistry I) and Chem 302 (Physical Chemistry I). These have helped the students tremendously.

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

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

APPENDIX II-B: Faculty Data

Name: Ernest Sekabunga	Rank: Associate Professor
Status: ☒ Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: Ph.D.
Degree Conferred by: Auburn University	Date Degree Received: December 1997
Area of Specialization: Inorganic Chemistry	

Professional registration/licensure:	
Years of employment at present institution:	18
Years of employment in higher education:	20
Years of related experience outside higher education:	

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT
2016/Spring	CHEM 100 Consumer Chemistry	9
2016/Spring	CHEM 100 Consumer Chemistry	11
2016/Spring	CHEM 100H Consumer Chemistry - Honors	3
2016/Spring	CHEM 108 General Chemistry Lab II	14
2015/Fall	CHEM 100 Consumer Chemistry	15
2015/Fall	CHEM 100 Consumer Chemistry	7
2015/Fall	CHEM 100 Consumer Chemistry	18
2015/Fall	CHEM 199 Special Topics: Foundations of Chemistry	8
Spring/2015	CHEM 100 Consumer Chemistry	21
Spring/2015	CHEM 100 Consumer Chemistry	16
Spring/2015	CHEM 100H Consumer Chemistry - Honors	3
Fall/2014	CHEM 100 Consumer Chemistry	20
Fall/2014	CHEM 100 Consumer Chemistry	12
Fall/2014	CHEM 100 Consumer Chemistry	23

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

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

Attended a Regional Workforce Development Conference. WVSU. November 2012.

Assessment Workshop conducted by Dr. Susan Hatfield, an Assessment Consultant. Cole Complex. February 2013

Assessment/LiveText Workshop. Drain-Jordan Library. April 2013.

Assessment Workshop conducted by Dr. Susan Murphy, an Assessment Consultant. Cole Complex. April 2014.

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

(E). Indicate any other activities that have contributed to effective teaching.

Developed and offered a "Foundations of Chemistry" course as a Special Topics course in Fall 2015. This course was intended to prepare students with deficiency for General Chemistry I.

Mentored five students in research related activities such as directed Student Research, Inquiry-Based Research for Education Majors, Summer Undergraduate Research Experience, and NASA Scholar.

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

(G). List externally funded research (grants and contracts) during the last five years.
West Virginia Research Trust Fund. "Acquisition of 400 MHz NMR – West Virginia State University" R. Charles Byers (PI), Micheal Fultz, Genia Sklute, Gerald Hankins, Ernest Sekabunga, Katherine Harper, 2011, $100,000

APPENDIX II-B: Faculty Data

Name: Genia Sklute	Rank: Associate Professor
Status: ☒ Full-time ☐ Part-time ☐ Adjunct ☐ Graduate Asst.	Highest Degree Earned: Ph.D.
Degree Conferred by: Technion-Israel Institute of Technology	Date Degree Received: 2007
Area of Specialization: Organic Chemistry	

Professional registration/licensure:
Years of employment in higher education: 7
Years of related experience outside higher education: 5

To determine compatibility of credentials with assignment:

(A). List courses you taught in the last two years (fall and spring semesters) of the review period. If you participated in team-taught courses, indicate each of them and what percent of these courses you taught. For each course include year and semester taught, course number, course title, and enrollment.

YEAR / SEMESTER	COURSE NUMBER AND TITLE	ENROLLMENT
2016/Spring	CHEM 100 Consumer Chemistry	21
2016/Spring	CHEM 205 Organic Chemistry I	9
2016/Spring	CHEM 207 Organic Chemistry Lab I	7
2016/Spring	NSM 490H Honors Research	6
2015/Fall	CHEM 100 Consumer Chemistry	21
2015/Fall	CHEM 206 Organic Chemistry II	20
2015/Fall	CHEM 206 Organic Chemistry Lab II	18
2015/Fall	HON 301 Philosophy of Research	7
2015/Fall	NSM 490H Honors Research	1
2015/Spring	CHEM 101 Health Science General Chemistry	3
2015/Spring	CHEM 205 Organic Chemistry I	19
2015/Spring	CHEM 208 Organic Chemistry Lab I	16
2014/Fall	CHEM 101 Health Science General Chemistry	4
2014/Fall	CHEM 205 Organic Chemistry II	12
2014/Fall	CHEM 208 Organic Chemistry Lab II	5

(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 four annual Mid-East Honors Association Meetings
Attended three National Collegiate Honors Council (NCHC) annual conferences
Completed the NCHC Assessment Institute

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

(E). Indicate any other activities that have contributed to effective teaching.

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

Sklute, G.; Cavender, H.; Marek, I. Carbozincation of Alkenes and Alkynes. In *Org. React.* **2015**, *87*.

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

Appendix II-E
Assessment

DEPARTMENT OF CHEMISTRY
GRADUATE EXIT SURVEY
PROGRAM LEARNING OUTCOMES

Directions – The survey will not be examined until after graduation has commenced, your results will remain anonymous throughout the study as well. Read the Department of Chemistry Program Learning Outcomes below. Answer the questions on how you, the pending graduate of the Department, perceive how we did in the following fields. Feel free to make comments on our strengths and weaknesses in each of the areas.

Program Learning Outcome
1. Demonstrate a conceptual understanding and integration of the fundamentals in organic, analytical, physical, inorganic, and biological chemistry.
Take a moment individualize your education in each of the areas. Check the box that corresponds to your judgment of education in each area. Feel free to make comments about the strengths and weaknesses in each area of your education.

Analytical Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

Comments:

Biological Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

Comments:

Inorganic Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

Comments:

Organic Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

Comments:

Physical Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

Comments:

2 Perform practical, standard laboratory procedures and techniques with a high level of precision and safety.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

3. Apply critical thinking and fundamental problem-solving strategies to scientific problems ranging from hands-on laboratory research to theoretical concepts.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

4. Demonstrate effective use of chemical literature through identifying various information sources in conjuncture with the retrieval and critical analysis of scientific literature.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

5. Demonstrate effective oral, written, and computer-aided communication skills pertaining to chemical applications.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

6. Conduct independent, systematic research.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

Any additional comments you would like to share about the strengths and weaknesses of the department.

West Virginia State University Assessment Results Chemistry Spring 2012				
Class Where Assessment Occurred	**Outcome being Assessed**	**Assignment or Instrument Used to Collect Data**	**Results**	**Planned Actions or Improvements Based on Assessment Results**
1. Chemistry 106	PLO 1	ACS Exam	**PLO 1** **AVG SCORE: 1.70 /4.0** **Developing** Students received developing scores on their ACS exams and are only beginning to demonstrate an understanding and proficiency in the area of general chemistry.	1. Item analyses of future exams shall be examined. 2. Conceptual areas of student weaknesses shall be discerned. 3. Strategies to address the areas of student weaknesses shall be adopted. 4. The avg. score is on the basis of raw scores. Change the basis to percentile scores to get a truer assessment.
2. Chemistry 108	PLO 1, 3, 4, 5, 6, 7	Lab Report	**PLO 1, 3, 4, 5, 6, 7** **AVG SCORE: 3.17 / 4.0–** **Accomplished** The majority of students were accomplished in demonstrating an understanding of general chemistry, searching for info and literature, conducting a hands-on lab, engaging in research, and displaying professional skills while doing so.	1. Continue to improve on the areas/concepts that are exemplary. 2. Determine the areas/concepts of deficiency and improve the focus on the specific issues of concern.
3. Chemistry 206	PLO 1	ACS Exam	**PLO 1** **AVG SCORE: 1.87 / 4.0** **Developing** Students received developing scores on their ACS exams and are only beginning to demonstrate an understanding and proficiency in the area of organic chemistry.	1. Item analyses of future exams shall be examined. 2. Conceptual areas of student weaknesses shall be discerned. 3. Strategies to address the areas of student weaknesses shall be adopted. 4. The avg. score is on the basis of raw scores. Change the basis to percentile

				scores to get a truer assessment.
4. Chemistry 208	PLO 1, 3, 4, 5, 6, 7	Lab Book		
5. Chemistry 301	PLO 2	ACS Exam		
6. Chemistry 303	PLO 2, 3, 4, 5, 6, 7	Lab Book	**PLO 2, 3, 4, 5, 6, 7** **AVG SCORE: 3.7 / 4.0 – Exemplary** The majority of students were exemplary in demonstrating an understanding of Physical chemistry, conducting a hands-on lab, engaging in research, and displaying professional skills while doing so.	To maintain the current exemplary performance, but will also attempt to improve on it further.
7. Chemistry 460-462	PLO 2, 3, 4, 5, 6, 7	Lab Book	**PLO 2, 3, 4, 5, 6, 7** **AVG SCORE: 2.6 / 3.0 – Exemplary** The majority of students were exemplary in demonstrating an understanding of in-depth chemistry, conducting a hands-on lab, engaging in research, and displaying professional skills while doing so.	Not only maintain this exemplary performance, but actually attempt to improve on it further.
8. Chemistry 460-462	PLO 2, 4, 7	Presentation	**PLO 2, 4, 7** **AVG SCORE: 3.5 / 4.0 – Exemplary** Student was exemplary in demonstrating an understanding of in-depth chemistry, searching for info and literature, and displaying professional skills while doing so	Not only maintain this exemplary performance, but actually attempt to improve on it further.

9. Chemistry 450	PLO 2	ACS Exam	**PLO 2** **AVG SCORE: 2.0 / 4.0** **Developing** Student received developing scores on the ACS exam and is only beginning to demonstrate an understanding and proficiency in the area of in-depth chemistry.	1. Item analyses of future exams shall be examined. 2. Conceptual areas of student weaknesses shall be discerned. 3. Strategies to address the areas of student weaknesses shall be adopted. 4. The avg. score is on the basis of raw scores. Change the basis to percentile scores to get a truer assessment.
10. Chemistry 450	PLO 2, 4, 7	Presentation	**PLO 2, 4, 7** **AVG SCORE: 4.0 / 4.0 – Exemplary** Student was exemplary in demonstrating an understanding of in-depth chemistry, searching for info and literature, and displaying professional skills while doing so	Not only maintain this exemplary performance, but actually attempt to improve on it further.

DEPARTMENT OF CHEMISTRY

GRADUATE EXIT SURVEY STUDENT RESPONSES
SPRING 2014 – SPRING 2016

PROGRAM LEARNING OUTCOMES

The results of the Department of Chemistry's Graduate Exit Survey administered Spring 2014 through Spring 2016 are listed below. The numbers in the boxes indicate the number of students who responded accordingly.

Program Learning Outcome, PLO.
PLO 1. Demonstrate a conceptual understanding and integration of the fundamentals in organic, analytical, physical, inorganic, and biological chemistry.

Analytical Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
1	3	2		

Biological Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
	2	2	2	

Inorganic Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
	5	1		

Organic Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
2	3	1		

Physical Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
1	5			

PLO 2 Perform practical, standard laboratory procedures and techniques with a high level of precision and safety.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
4	2			

PLO 3. Apply critical thinking and fundamental problem-solving strategies to scientific problems ranging from hands-on laboratory research to theoretical concepts.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All

1	4			

PLO 4. Demonstrate effective use of chemical literature through identifying various information sources in conjuncture with the retrieval and critical analysis of scientific literature.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
2	3	1		

PLO 5. Demonstrate effective oral, written, and computer-aided communication skills pertaining to chemical applications.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
3	1	2		

PLO 6. Conduct independent, systematic research.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
3	1	2		

Any additional comments you would like to share about the strengths and weaknesses of the department.

Appendix III-A
Program Enrollment Data

APPENDIX III-A: Program Enrollment Data

Academic Year	Number of Majors	Number of Graduates
2011-2012	52	6
2012-2013	36	0
2013-2014	40	3
2014-2015	37	3
2015-2016	41	1

Appendix III-B
Course Enrollment Data

APPENDIX III-B: Course Enrollment Data

Course	Academic Year	No. of Sections	Credit Hours	Enrollment	C.H.P.
CHEM 105	2011 - 2012	4	3	91	273
	2012 - 2013	3	3	68	204
	2013 - 2014	4	3	82	246
	2014 - 2015	5	3	93	279
	2015 - 2016	5	3	89	267
CHEM 106	2011 - 2012	3	3	48	144
	2012 - 2013	4	3	44	132
	2013 - 2014	3	3	46	138
	2014 - 2015	4	3	59	177
	2015 - 2016	3	3	56	168
CHEM 107	2011 - 2012	5	2	77	154
	2012 - 2013	4	2	53	106
	2013 – 2014	5	2	72	144
	2014 – 2015	5	2	83	166
	2015 - 2016	5	2	78	156
CHEM 108	2011 – 2012	3	2	38	76
	2012 – 2013	4	2	34	68
	2013 – 2014	3	2	43	86
	2014 – 2015	6	2	54	108
	2015 - 2016	4	2	38	76
CHEM 202	2011 – 2012	1	2	3	6
	2012 – 2013	2	2	13	26
	2013 – 2014	1	2	3	6
	2014 – 2015	1	2	5	10
	2015 - 2016	1	2	9	18
CHEM 205	2011 - 2012	3	3	44	132
	2012 - 2013	3	3	40	120
	2013 - 2014	2	3	23	69
	2014 - 2015	3	3	59	177
	2015 - 2016	2	3	31	93
CHEM 206	2011 – 2012	2	3	28	84
	2012 – 2013	2	3	24	72
	2013 – 2014	2	3	21	63
	2014 – 2015	2	3	25	75
	2015 - 2016	2	3	43	129
CHEM 207	2011- 2012	4	2	38	76
	2012 – 2013	4	2	32	64
	2013 – 2014	2	2	18	36
	2014 – 2015	4	2	46	92
	2015 - 2016	3	2	25	50
CHEM 208	2011 – 2012	3	2	18	36
	2012 – 2013	2	2	20	40
	2013 – 2014	3	2	21	42
	2014 – 2015	2	2	18	36
	2015 – 2016	2	2	35	70

CHEM 211	2011 – 2012	1	4	3	12
	2012 – 2013	1	4	3	12
	2013 – 2014	1	4	8	32
	2014 – 2015	1	4	5	20
	2015 - 2016	1	4	7	28
CHEM 301	2011 – 2012	1	3	2	6
	2012 – 2013	1	3	3	9
	2013 – 2014	1	3	4	12
	2014 – 2015	1	3	3	9
	2015 - 2016	1	3	4	12
CHEM 302	2011 – 2012	1	3	0	0
	2012 – 2013	1	3	3	9
	2013 – 2014	1	3	0	0
	2014 – 2015	1	3	1	3
	2015 - 2016	1	3	0	0
CHEM 303	2011 – 2012	1	2	2	4
	2012 – 2013	1	2	3	6
	2013 – 2014	1	2	4	8
	2014 – 2015	1	2	3	6
	2015 - 2016	1	2	4	8
CHEM 304	2011 – 2012	1	2	0	0
	2012 – 2013	1	2	1	2
	2013 – 2014	1	2	0	0
	2014 – 2015	1	2	1	2
	2015 - 2016	1	2	0	0
CHEM 312	2011 – 2012	1	3	3	9
	2012 – 2013	1	3	1	3
	2013 – 2014	1	3	0	0
	2014 – 2015	1	3	0	0
	2015 - 2016	1	3	0	0
CHEM 331	2011 – 2012	1	3	11	33
	2012 – 2013	1	3	19	57
	2013 – 2014	1	3	19	57
	2014 – 2015	1	3	23	69
	2015 - 2016	1	3	18	54
CHEM 333	2011 – 2012	1	2	2	4
	2012 – 2013	1	2	7	14
	2013 – 2014	1	2	3	6
	2014 – 2015	1	2	8	16
	2015 - 2016	1	2	9	18
CHEM 350	2011 – 2012	1	1	1	1
	2012 – 2013	1	1	2	2
	2013 – 2014	1	1	2	2
	2014 – 2015	1	1	4	4
	2015 - 2016	1	1	4	4
CHEM 356	2011 – 2012				
	2012 – 2013	1	3	5	15
	2013 – 2014	1	3	0	0
	2014 – 2015	1	3	0	0
	2015 - 2016	0	3	0	0

CHEM 357	2011 – 2012				
	2012 – 2013	1	3	1	3
	2013 – 2014	0	3	0	0
	2014 – 2015	1	3	0	0
	2015 – 2016	0	3	0	0
CHEM 411	2011 – 2012	1	3	2	6
	2012 – 2013	0	3	0	0
	2013 – 2014	1	3	3	9
	2014 – 2015	1	3	3	9
	2015 - 2016	1	3	1	3
CHEM 413	2011 – 2012	1	2	0	0
	2012 – 2013	0	2	0	0
	2013 – 2014	0	2	0	0
	2014 – 2015	1	2	1	2
	2015 - 2016	1	2	1	2
CHEM 416	2011 – 2012	1	3	2	6
	2012 – 2013	1	3	2	6
	2013 – 2014	0	3	0	0
	2014 – 2015	1	3	4	12
	2015 - 2016	1	3	4	12
CHEM 418	2011 – 2012	1	2	2	4
	2012 – 2013	1	2	2	4
	2013 – 2014	0	2	0	0
	2014 – 2015	1	2	4	8
	2015 - 2016	1	2	4	8
CHEM 420	2011 – 2012				
	2012 – 2013				
	2013 – 2014				
	2014 – 2015	1	1	0	0
	2015 – 2016	2	1	0	0
CHEM 425	2011 – 2012	0	3	0	0
	2012 – 2013	0	3	0	0
	2013 – 2014	1	3	1	3
	2014 – 2015	1	3	0	0
	2015 - 2016	1	3	0	0
CHEM 429	2011 – 2012	1	3	2	6
	2012 – 2013	0	3	0	0
	2013 – 2014	1	3	4	12
	2014 – 2015	1	3	2	6
	2015 - 2016	1	3	0	0
CHEM 450	2011 – 2012	1	1	1	1
	2012 – 2013	1	1	2	2
	2013 – 2014	1	1	4	4
	2014 – 2015	1	1	3	3
	2015 – 2016	1	1	1	1
CHEM 460	2011 – 2012	3	1	2	2
	2012 – 2013	4	1	1	1
	2013 – 2014	3	1	2	2
	2014 – 2015	3	1	1	1
	2015 – 2016	2	1	1	1

CHEM 461	2011 – 2012	3	2	2	4
	2012 – 2013	4	2	0	0
	2013 – 2014	3	2	0	0
	2014 – 2015	3	2	0	0
	2015 - 2016	2	2	1	2
CHEM 462	2011 – 2012	3	3	1	3
	2012 – 2013	4	3	4	12
	2013 – 2014	3	3	2	6
	2014 – 2015	3	3	5	15
	2015 - 2016	2	3	4	12
CHEM 512	2011 – 2012	1	3	5	15
	2012 – 2013	1	3	0	0
	2013 – 2014	1	3	0	0
	2014 – 2015	2	3	1	3
	2015 – 2016	0	3	0	0
CHEM 525	2011 – 2012	0	3	0	0
	2012 – 2013	0	3	0	0
	2013 – 2014	1	3	0	0
	2014 – 2015	0	3	0	0
	2015 – 2016	0	3	0	0
CHEM 531	2011 – 2012	1	3	3	9
	2012 – 2013	1	3	5	15
	2013 – 2014	1	3	2	6
	2014 – 2015	0	3	0	0
	2015 - 2016	0	3	0	0
CHEM 533	2011 – 2012	1	2	3	6
	2012 – 2013	1	2	1	2
	2013 – 2014	1	2	1	2
	2014 – 2015	0	2	0	0
	2015 - 2016	0	2	0	0

Appendix III-E
Service Courses

APPENDIX III-E: Service Courses

Course	**Other Program**
CHEM 100	General Education
CHEM 100H	Honors General Education
CHEM 101	Pre-Nursing
CHEM 105	Biology, Computer Science, Education, Engineering, Mathematics
CHEM 106	Biology, Computer Science, Education, Engineering, Mathematics
CHEM 107	Biology, Education, Engineering, Mathematics
CHEM 108	Biology, Education, Engineering, Mathematics
CHEM 201	Education, Pre-Nursing
CHEM 205	Biology, Education
CHEM 206	Biology, Education
CHEM 207	Biology, Education
CHEM 208	Biology, Education
CHEM 211	Education
CHEM 301	Education
CHEM 331	Biology, Education
CHEM 333	Biology
CHEM 459	Education
CHEM 512	Biotechnology
CHEM 525	Biotechnology
CHEM 531	Biotechnology
CHEM 533	Biotechnology

EXHIBITS

EXHIBIT I

ACS Report Guidelines

2012 Periodic Report Checklist
ACS Committee on Professional Training

1. Use the cover sheets from the website. Organize your report in the order of the cover sheets.
2. Submit three copies of your periodic report form.
3. Submit two copies of your printed college catalog or two copies of the department and course description pages of your on-line catalog.
4. Refer to the ACS Guidelines for the requirements for an ACS-approved program.
5. Submit two copies of all course materials from five **in-depth** courses that include a classroom component taught within the chemistry program that represent coverage in each of the five chemistry subdisciplines: analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, and physical chemistry (ABIOP).

   Course materials must include:

   - Syllabus with a list of topics taught (not references to book chapters or pages)
   - All exams, including the final

   Materials must be from courses taught during the last two academic years.

   If you did not teach an in-depth course in a particular subdiscipline during the last two academic years, submit the materials for the foundation course instead.
6. If the only coverage in a foundation area is provided by a course taught outside the chemistry department, submit two copies of the syllabi and exams for that course work as well as materials from five courses taught within the chemistry department.
7. Submit two copies of syllabi and exams for courses taught outside the chemistry program if they are used as one of the four (or six for programs on the quarter system) required in-depth courses used for student certification. Include a description of how the course(s) builds on the molecular nature of chemistry.
8. Submit two copies of the experiment lists from courses used to cover at least four of the five foundation areas (ABIOP). Include a descriptive title and a list of instruments used in each experiment, if applicable. Include the course title and course number for each experiment list.
9. **Include the school name, course name, course number, and year taught on all course materials.**
10. If research may be used to fulfill certification requirements, submit a sample (one copy of three to five reports) of the comprehensive student research reports or theses representative of multiple disciplines and faculty, with the grade the student received indicated on each report. Also indicate on each report the number of terms (semesters or quarters) and actual student hours per term of research covered by the report. The reports must be prepared by students. Do not submit publication reprints or co-authored reports. These reports will be returned if you so indicate on page 18, item 6.2 of the report form.

If your department does not have a full listing in the ACS Directory of Graduate Research,

11. Submit two copies of a list of all faculty and student publications from the last five years. Please underline the names of undergraduate student authors where applicable.

Forms can be downloaded at:

URL: http://acswebcontent.acs.org/cpt/
Username: faculty
Password: publications

Submit your report to:

Office of Professional Training
American Chemical Society
1155 Sixteenth Street, N.W.
Washington, DC 20036

ACS Chemistry for Life®

American Chemical Society

COMMITTEE ON PROFESSIONAL TRAINING
1155 Sixteenth Street, N.W.
Washington, DC 20036

Fax: (202) 872-6066
Email: cpt@acs.org
Web: www.acs.org/cpt

Cathy A. Nelson, *Secretary* (202) 872-4589

26 May 2016

TO: Chairs and Heads of ACS-Approved Programs

Each year all schools on the ACS-approved list are required to submit an annual report, which includes data on your graduates, courses, and faculty. To submit your 2015-2016 annual report, you should go online and enter information for your school, including:

1. Department Information (changes in department chair or head, preparer, and contact information)
2. Chemistry Staff Listing (list all staff who are teaching in chemistry, including part-time, temporary, and adjunct appointments)
3. Certification Information
4. Record of Graduates (Bachelor's, Master's, PhD, as applicable)
5. 2015-2016 Supplemental Information (for non-PhD granting schools only)
6. International Experience Survey

Please note: You are reporting graduate data for the period July 1, 2015, through June 30, 2016.

Where possible, we have attempted to make the electronic submission self-explanatory. On the login screen, you will notice a link to an **Instructions and FAQ** page that allows you to access a PDF file of an instruction sheet as well as numerous PDF files related to specific pages and functions. The Frequently Asked Questions pages are based on the comments received from users. I welcome any suggestions you have for making the data submission easier and more efficient.

We will mail certificates to you to distribute to all graduates whom you identify as certified on your annual report. As in the past, you can still request certificates for presentation to your graduates by sending an email to cpt@acs.org. You must provide the names of your certified graduates as they should appear on the certificate. We track these requests so that you will not receive a duplicate certificate for your graduates. **If you do not wish for us to send certificates for your graduates, please notify me at cpt@acs.org before you submit your annual report.**

A few helpful tips:

- You do not have to finish in one online session; you may save your work and return later.
- Clicking on either the **Print Blank Reports** or **Print Completed Reports** buttons will cause a pop-up window to appear with the appropriate report (in PDF format). *Note: you may be required to disable your pop-up blocker or designate that your system should always allow pop-ups from this site.*
- On the Record of Graduates page, if you are uploading student information from the template be sure to follow the formatting directions or you will get an error message (example: enter "M" or "F" instead of "Male" or "Female"). If you are individually entering names, be sure to save your work frequently, as the system cannot store many entries without saving.
- When you are completely finished entering your department's 2015-2016 data, be sure to print or save a copy of your report for your records then select the **All Forms are Complete** button. Be sure to print a copy of your complete report for your records before hitting **All Forms are Complete** as this locks you out of the system.

Your school's username and password to access the system are recorded below.

Please complete the report submission as soon as possible, but no later than **August 26, 2016.** If you have problems with the error messages or technical problems with the system, please check our FAQ pages or contact Giacomo Abrusci at g_abrusci@acs.org for assistance. As always, I am interested in hearing your comments or suggestions for improving the online reporting system. Thank you for your cooperation.

Sincerely,

Cathy A. Nelson
Secretary
Committee on Professional Training

West Virginia State University
Username = [redacted]
Password = [redacted]

Access Annual Report Web Site at: www.acs.org/education/CARS

CAN/daa

EXHIBIT II

WVSU Academic Readiness & Exit Abilities

WVSU Academic Readiness & Exit Abilities

Table 1. Indicators of Academic Readiness for First-time Full-time freshman cohort fall 2011-2015

Institutional Level						Chemistry majors				
ACT (average)	**2011**	**2012**	**2013**	**2014**	**2015**	**2011**	**2012**	**2013**	**2014**	**2015**
English	20	20.3	19.9	19.2	19.4	22.00	20.57	22.71	20.33	18.50
Mathematics	18.6	18.1	18.5	18.5	18.8	21.73	20.14	20.14	19.00	20.50
Composite	20.1	19.8	19.9	19.6	19.9	21.82	20.29	21.86	20.33	20.10
Number with ACT Scores on Record	271	250	348	349	318	11	7	7	3	10
High School GPA	**2011**	**2012**	**2013**	**2014**	**2015**	**2011**	**2012**	**2013**	**2014**	**2015**
Mean	3.05	3.03	3.03	3.05	3.08	3.24	3.03	3.30	2.83	3.46
Top 10% Rank	3.93	3.8	3.80	3.83	3.91	4.00	3.68	3.94	3.77	4.00
Top 25% Rank	3.54	3.43	3.50	3.46	3.58	3.96	3.55	3.72	3.59	4.00
50% Rank	3.10	3.04	3.01	3.06	3.13	3.41	3.20	3.43	2.77	3.72
Lower 25% Rank	2.54	2.66	2.61	2.65	2.60	2.62	2.50	2.76	2.12	2.81
Lower 10% Rank	2.16	2.23	2.23	2.30	2.27	2.05	1.89	2.57	2.00	2.66
Number with HSGPA's on Record	276	269	378	391	354	12	6	8	4	11

Note: The number of first-time freshmen enrolled at WVSU declined from 416 for Fall 2014 to 365 for Fall 2015.
Note: Table 1 compares the fall 2015 class to the fall 2011 through fall 2014 classes based on their ACT Scores and high school grade point averages.

Data Source: Official 30 Day Census Student files
Produced by: Office of Institutional Research, Assessment, and Effectiveness

Table 2. Indicator of Academic Exit Abilities of All Undergraduates 2011-2016

All Undergraduate GPAs						Chemistry Graduate GPAs				
	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Graduates per Academic Year	**411**	**383**	**397**	**422**	**396**	**5**	**1**	**3**	**3**	1
GPA	3.0	3.0	3.1	3.1	3.1	2.69	2.03	3.36	3.11	3.6

Note: Table 2 is based upon the GPA of **ALL** undergraduates who graduated and is not limited to first-time full-time freshmen cohorts.

Data Source: Official HEPC Graduation files
Produced by: Office of Institutional Research, Assessment, and Effectiveness

EXHIBIT III

Chemistry Financial Information

Department of Chemistry Financial Information
2011-2016

	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Science Lab Fee Total collections	$ 54,606.06	$ 63,111.50	$ 72,590.25	$ 77,224.33	$ 81,113.71
Chemistry College Operations	$ 17,000.00	$ 2,600.00	$ 850.00	$ 850.00	$ 850.00
Science Lab Fee generated by Chemistry.	$ 17,200.00	$ 19,315.80	$ 22,137.00	$ 25,823.00	$ 19,864.00

EXHIBIT IV

Assessment Timeline 2012-2017

Department of Chemistry
Assessment Timeline

YEARS	SEMESTER	COURSE-LEVEL PLOS ASSESSED	TOOLS
Spring 2012 – Fall 2017	Spring Semesters	Chemistry 106	ACS Exam (PLO 1,3)
		Chemistry 108	Lab Report (PLO 1,2,5)
		Chemistry 206	ACS Exam (PLO 1,3)
		Chemistry 208	Lab Book (PLO 1,2,3,4,5)
		Chemistry 460-462	Lab Book (PLO 1,2,3,4,5,6) Presentation (PLO 1,3,4,5)
		Chemistry 450	ACS Exam (PLO 1,3) Presentation (PLO 1,3,4,5)
	Fall Semesters	Chemistry 106	ACS Exam (PLO 1,3)
		Chemistry 108	Lab Report (PLO 1,2,5)
		Chemistry 206	ACS Exam (PLO 1,3)
		Chemistry 208	Lab Book (PLO 1,2,3,4,5)
		Chemistry 301	ACS Exam (PLO 1,3)
		Chemistry 303	Lab Book (PLO 1,2,3,4,5)
		Chemistry 460-462	Lab Book (PLO 1,2,3,4,5,6) Presentation (PLO 1,3,4,5)
		Chemistry 350	Writing Assignment (PLO 1,3,4,5)

EXHIBIT V
Assessment of Student Learning Report
2015-2016

WEST VIRGINIA STATE UNIVERSITY
1891
Find Your Passion.

Academic Affairs Assessment of Student Learning
Report for Academic Year _2015 - 2016___

Department/Program _Chemistry_____
Assessment Coordinator's Name: Ernest Sekabunga
Assessment Coordinator's Email Address: sekabuej@wvstateu.edu

1. **Which learning outcomes did you measure this past year?** [Please indicate whether any of these measures were conducted as follow-up to a previous year's issues or in response to Program Review. Be specific.]

   Program Learning Outcomes, PLOs 1 and 3 were measured this past year.
   PLO 1. Explain the fundamentals in organic, analytical, physical, inorganic, and biological chemistry.
   PLO 3. Apply problem-solving strategies to scientific problems.

2. **In which course(s) were assessments conducted?**

PLOs Assessed	**Assessment point**
1 and 3	Chem. 106: General Chemistry II
1 and 3	Chem. 206: Organic Chemistry II
1 and 3	Chem. 301: Physical Chemistry I
1 and 3	Chem. 450: Senior Seminar
1 - 6	Chem. 450: Senior Seminar

3. **How did you assess the selected program learning outcomes?** (i.e., what did you assess –group project, skills demonstration, presentation, performance, debate, lab experiment, online discussion, etc. *and*- what tool (measure) did you use - rubric, nationally or state-normed exam, item analysis, pre-posttest design, skills inventory, survey, etc.)

PLOs Assessed	Assessment point	Assessment tool (Direct or Indirect)
1 and 3	Chem. 106 General Chemistry II	ACS* 2nd semester General Chemistry Exam (Direct)
1 and 3	Chem. 206 Organic Chemistry II	ACS two semester Organic Chemistry Exam (Direct)
1 and 3	Chem. 301 Physical Chemistry I	ACS 1st semester Physical Chemistry Exam (Direct)
1 and 3	Chem. 450 Senior Seminar	ACS DUCK** Exam (Direct)
1 - 6	Chem. 450 Senior Seminar	Department Graduate Exit Survey*** (Indirect)

*ACS: American Chemical Society.

**DUCK: Diagnostic of Undergraduate Chemistry Knowledge.

***This is aligned with our program learning outcomes. It solicits information from the graduating seniors on how well they thought the department met its program learning outcomes.

4. How many students were included in the assessment(s) of each PLO in a course?

Assessment point	Assessment tool (Direct or Indirect)	Number of students
Chem. 106 General Chemistry II	ACS* 2nd semester General Chemistry Exam (Direct)	50
Chem. 206 Organic Chemistry II	ACS two semester Organic Chemistry Exam (Direct)	24
Chem. 301 Physical Chemistry I	ACS 1st semester Physical Chemistry Exam (Direct)	4
Chem. 450 Senior Seminar	ACS DUCK** Exam (Direct)	3
Chem. 450 Senior Seminar	Department Graduate Exit Survey*** (Indirect)	6

5. **How were students selected to participate in the assessment of each outcome (**Helpful details might include- whether this assessment represents all students, a sample of students in a class, or a sample of students across sections)?

   All the students in these courses.

6. **In general, describe how each assessment tool (measure) was constructed** (i.e. in-house, national, adapted).

   The American Chemical Society, ACS Exams are written by the American Chemical Society Division of Chemical Education Examinations Institute.
   The Department Graduate Exit Survey was constructed in-house. This is aligned with our program learning outcomes. It solicits information from the graduating seniors on how well they thought the department met its program learning outcomes. It is scaled as; Extremely Well, Very Well, Adequately Well, Not Very Well, and Not at All.

7. **Who analyzed results and how were they analyzed**

Assessment point **Assessment tool**	**Analysis of results done by:**	**Method of analysis**
Chem. 106 ACS* 2nd semester General Chemistry Exam	Department faculty	Item analysis of student responses
Chem. 206 ACS two semester Organic Chemistry Exam	Department faculty	Item analysis of student responses
Chem. 301 ACS 1st semester Physical Chemistry Exam	Department faculty	Item analysis of student responses
Chem. 450 ACS DUCK** Exam	Department faculty	Scores by chemistry sub-discipline
Chem. 450 Department Graduate Exit Survey	Department faculty	Number of responses per scale

8. **Provide a summary of the results/conclusions from the assessment of each measured Program Learning Outcome.** *Report scores for this assessment, as well as students' strengths and weaknesses relative to this learning outcome.*

   - ACS 2nd semester General Chemistry Exam.
     The results of the three sections of students who took this exam during the academic year have been item analyzed by topic or concept. Questions where less than 25% of the students got correct were deemed most difficult. The questions that were deemed most difficult covered concepts in Physical Properties of Solutions, Chemical Kinetics, Acids and Bases, and Acid-Base Equilibria and Solubility Equilibria.

   - ACS two semester Organic Chemistry Exam.
     The results of one sections of students who took this exam during the academic year have been item analyzed by topic or concept. Each question was classified into one of five topic/concept areas – General, Synthesis, Alkene, Spectroscopy, Carbonyl Chemistry, and Mechanism. Based on the item analysis data, students' area of greatest weakness was Carbonyl Chemistry in which less than 25% of the student responses were correct.

- ACS 1st semester Physical Chemistry Exam.
  An item analysis of student test scores by topic or concept showed student difficulty in; Equilibrium, specifically equilibrium constant comparison and relative equilibrium molarities, Enthalpy, specifically calorimetry, and Entropy, specifically heat engine efficiency.

- ACS Diagnostic of Undergraduate Chemistry Knowledge (DUCK) Exam.
  This exam is given to graduating seniors in Senior Seminar. In the exam administered in Spring 2015 student scores in the chemistry sub-disciplines increased in the following respective order; biological, analytical, physical, organic, and inorganic chemistry. Since then an item analysis of the biological chemistry questions has been done. Topics or concepts students found most difficult include; Thermodynamics of living systems, Carbohydrates and glycosidic bonds, Enzyme kinetics, and Metabolism.

- Department Graduate Exit Survey.
  Since its introduction three years ago the department has collected and sealed six surveys out of the possible eight. These surveys were unsealed at the end of the Spring 2016 semester providing the department data from graduating seniors over a three year period.
  Listed below are the student responses.

Program Learning Outcome, PLO.

PLO 1. Demonstrate a conceptual understanding and integration of the fundamentals in organic, analytical, physical, inorganic, and biological chemistry.

Analytical Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
1 student	3 students	2 students		

Biological Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
	2	2	2	

Inorganic Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
	5	1		

Organic Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
2	3	1		

Physical Chemistry

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
1	5			

PLO 2 Perform practical, standard laboratory procedures and techniques with a high level of precision and safety.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
4	2			

PLO 3. Apply critical thinking and fundamental problem-solving strategies to scientific problems ranging from hands-on laboratory research to theoretical concepts.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
1	4			

PLO 4. Demonstrate effective use of chemical literature through identifying various information sources in conjuncture with the retrieval and critical analysis of scientific literature.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
2	3	1		

PLO 5. Demonstrate effective oral, written, and computer-aided communication skills pertaining to chemical applications.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
3	1	2		

PLO 6. Conduct independent, systematic research.

Extremely Well	Very Well	Adequately Well	Not Very Well	Not at All
3	1	2		

9. **What are next steps?** (e.g., will you measure this same learning outcome again? Will you change some feature of the classroom experience and measure its impact? Will you try a new tool? Are you satisfied?)

   The same learning outcomes shall be measured again during the 2016 – 2017 academic year with the same assessment tools. This shall provide the Department with 3 years of assessment data on Program Learning Outcomes 1 and 3.

10. **Please attach an example of the assessment tool used to measure your PLO(s).** These can be added as an appendix, a link to the assessment, or sent separately in email with your report.

    Copying the ACS Exams is prohibited.
    The Graduate Exit Survey is added as an appendix.

EXHIBIT VI

External Advisory Committee

WEST VIRGINIA STATE UNIVERSITY
DEPARTMENT OF CHEMISTRY

EXTERNAL ADVISORY COMMITTEE

Ms. Anne Barthe – West Virginia Executive Director, Tech Connect.

Mr. Michael Carte – RESA III Science Coordinator, RESA III.

Dr. Kevin DiGregorio – Executive Director, Chemical Alliance Zone.

Dr. Eric King – Senior Chemist, MATRIC.

Dr. Rebecca Linger – Professor, University of Charleston School of Pharmacy.

Dr. Glenn Miller – Senior Scientist, Dow Chemical Company.

Mr. Michael Wright – Chemist, Dupont.

EXHIBIT VII

Scholarships.

Scholarships available to Chemistry majors

- **ACS-Hach Land Grant Undergraduate Scholarship.** Originally established by the Hach Scientific Foundation of Colorado and transferred to the ACS. The recipient must be a full-time undergraduate chemistry major with an expressed interest in teaching high school chemistry. The recipient must maintain a 3.0 GPA. Up to two annual $6000 scholarships. For AY 2016-2017 this was increased to $10,000

- **Dr. Basudeb DasSarma Scholarship**. Established to honor Dr. Basudeb DasSarma by an anonymous friend. The candidate must be a full-time chemistry major, a resident in the areas immediately surrounding the College (i.e., Institute, Dunbar, Nitro, and Cross Lanes). Recipient must have a minimum cumulative GPA of 3.5, demonstrate financial need, and have at least two (2) letters of reference from high school instructors, counselors, or principal. May be used for tuition, fees, or books and may be extended for up to eight semesters. Recommended by the Chemistry Department.

- **John F. Haskin** – Established by the widow and children of Dr. John F. Haskin, a respected research chemist. Recipient must be a full-time junior or senior chemistry major, have a minimum cumulative GPA of 3.25. Scholarship is renewable, contingent on maintaining a 3.25 GPA. Recommended by the Chemistry Department.

- **Richard & Shirley Weese Chemistry Scholarship**. The preferred candidate is an undergraduate, full-time student seeking a degree in chemistry. First preference shall be given to students pursuing an American Chemical Society certified degree. Second preference shall be given to students seeking an applied chemistry degree. Candidate must be in good academic standing and demonstrates academic merit or academic potential. Financial need is a primary consideration. Recommended by the Chemistry Department.

  Donor(s) or Honoree
  Richard Weese graduated from West Virginia State University (then College) in 1964 with a B.S. degree in chemistry and went on to a successful career as an industrial chemist. Shirley Weese, a virologist, passed away in 2001. She dedicated her life to helping the disadvantaged, especially women and children. Richard is establishing this scholarship in her memory and in grateful appreciation for the professors who mentored him when he was a student. Established Spring 2015. Up to $1000 per year

- **Weinkauf Family Scholarship**. The preferred candidate must be an undergraduate, full-time student seeking a degree in one of the sciences and must be in good academic standing with the university or demonstrates academic merit. Financial need may be a consideration. Recommended by Dr. Michel Fultz, Associate Professor of Chemistry and the Dean of Natural Sciences and Mathematics.

EXHIBIT VIII

Student Research Presentations
2014-2016

Student Research Presentations 2014 – 2016

Student presenter(s) listed first, faculty research director(s) listed last.

AY 2014 - 2015

Undergraduate Research Day at the Capitol. Charleston WV. March 2015. Poster presentations.

- Bridgett Dudding and Thomas Guetzloff. "Microwave Synthesis of Succinic Anhydrides."
- Megan Guetzloff and Micheal Fultz. "Synthesizing Triesterified Monosaccharides for Trialing in Protected Culture Pest Control."
- Christopher Newman and Genia Sklute. "Extraction of Carotenoids from Pumpkins."
- Jordan O'Dell and Ernest Sekabunga. "Extraction of Fe(II) and Zn(II) Ions from Aqueous Solution."
- Tabatha Slater and Micheal Fultz. "Synthesis of Capsaicin Analogs."

249th National ACS meeting. Denver, CO. March 2015. Poster presentations.

- Bridgett Dudding, Micheal Fultz, and Thomas Guetzloff. "Microwave synthesized succinimides purified by flash chromatography."
- Hannah Cavender, Megan Guetzloff, Micheal Fultz, and Barbara Liedl. "Synthesizing and trialing triesterified monosaccharides for protected culture pest control."
- Bridgett Dudding, Megan Guetzloff, Micheal Fultz, and Thomas Guetzloff. "Microwave synthesis of N-phenyl succinimides and malenamides in undergruate organic chemistry laboratory."
- Tabatha Slater, Ethan Higginbotham, and Micheal Fultz. "Synthesis of capsaicin analogs."
- Tabatha Slater and Micheal Fultz. "Progress toward the synthesis of (S)-curvularin."
- Brandi Bricker, Jade Weinkauf, and Micheal Fultz. "Water quality education."

Before the WV NASA Space Grant Consortium Board of Directors. April 2015. Oral presentation.

- James White and Genia Sklute. "Removal of Aluminum from Soil by Nitrogen Ligands."

WVSU College of Natural Sciences & Mathematics 20th Annual Research Symposium. Institute, WV. April 2015.

NASA WV Space Grant Consortium Scholarship Recipients: Undergraduate Student Research. Oral presentations.

- Tabather Slater, Bridgett N. Dudding, and Micheal Fultz. "Synthesis of Capsaicin Analogs."
- James E. White, III, and Genia Sklute. "Removal of Aluminum from Soil by Nitrogen Ligands."

Research Rookies Research. Poster presentations.

- Sherman A. Bernett and Thomas Guetzloff. "Gas Chromatography."
- Bridgett Dudding, Hannah Cavender, and Micheal Fultz. "Synthesizing and Trialing Triesterified Monosaccharides on the Biocontrol generalist predator, common green lacewing, *Chrysoperia carnea*."
- Megan B. Guetzloff and Micheal Fultz. "Progress towards the Synthesis of Curvularin."

WVSU Summer Undergraduate Research Experience (SURE). Institute, WV. July 31, 2015. Oral presentations.

- Brandi Bricker, and Miceal Fultz. "Progress towards the synthesis of dihydroresveratrol dimers."
- Emma Nellhaus, Isabelle Haverty, George Wilkinson III, and Micheal Fultz "Progress toward the total synthesis of sumalarin A."

AY 2015 - 2016

13th Annual Undergraduate Research Day at the Capitol. Charleston, WV. February, 2016. Poster presentations.

- Brandi Bricker, and Micheal Fultz. "Progress toward the total synthesis of biologically active dihydroresveratrol dimers."
- Morgan Bright, and Micheal Fultz. "Regio- and Quantitative Sulfonation of Polyaromatic Systems for Polymers and Environmental Studies."
- Emma Nellhaus, and Micheal Fultz. "Progress toward the synthesis of SumalarinA."
- Justin Spralding, Aaron Smith, Joseph Merola, and Sharon Molnar. "Synthesis of a Ru^{II}/Pd^{II} Polypyridyl Bimetallic Complex Anticancer Agent."

251st National ACS Meeting. San Diego, CA. March 2016. Poster presentations.

- Brandi Bricker and Micheal Fultz. "Efforts toward dihydroresveratrol dimers."
- Morgan Bright, Emma Nelhaus, and Micheal Fultz. "Polymeric Sulfonations."
- Aaron Smith, Amanda Smith, and Micheal Fultz. "Hygeine Education."

WVSU College of Natural Sciences and Mathematics 21st Annual Research Symposium. Institute, WV. April 2016.

NASA WV Space Grant Consortium Scholarship Recipients: Undergraduate Student Research. Oral presentations.

- Brandi Bricker, and Micheal Fultz. "Progress toward the total synthesis of biologically active dihydroresveratrol dimers."
- Morgan Bright, Emma Nellhaus, and Micheal Fultz "Regioselective sulfonation of polyaromatic systems for polymers and environmental studies."

- Shealyn Shafer, and Genia Sklute. "Synthesis and Characterization of a Nitrogen-Containing Ligand."
- Chessie Shamblin, and Ernest Sekabunga. "Aqueous Metal Ion Extraction: Copper(II) and Nickel(II)."

EXHIBIT IX

SMACS Awards and Activities

Student Members of the American Society (SMACS) Awards

Academic year	Chapter Rating	Green Chemistry
2015-2016	Commendable	Green Chemistry Award
2014-2015	Outstanding	Green Chemistry Award
2013-2014	Outstanding	Green Chemistry Award
2012-2013	Outstanding	Green Chemistry Award
2011-2012	Outstanding	Green Chemistry Award

The SMACS were awarded an "Outstanding Chapter" rating in 2013-2014. Below is a list of activities that earned them the rating.

Date: 5/8/2014
Name: Be the Donor Number of People Served (Audience): 2
Location: West Virginia State University Number of ACS Student/Chapter Members: 4

Date: 4/26/2014
Name: WVSU Cares Day Number of People Served (Audience): 54
Location: 4 Mile strip mine Number of ACS Student/Chapter Members: 5

Date: 4/14/2014
Name: Red Cross Blood Drive Number of People Served (Audience): 60
Location: West Virginia State University Number of ACS Student/Chapter Members: 6

Date: 4/2/2014
Name: Spring in to Fall Registration Number of People Served (Audience): 400
Location: West Virginia State University Number of ACS Student/Chapter Members: 3
NCW/Mole Day/CCED: N/A

Date: 3/14/2014
Name: Lakeside Elementary Number of People Served (Audience): 270
Location: Hurricane, WV Number of ACS Student/Chapter Members: 8

Date: 2/28/2014
Name: West Teays Elementary School Number of People Served (Audience): 540
Location: Teays Valley, WV Number of ACS Student/Chapter Members: 10

Date: 2/22/2014
Name: Chemistry Merit Badge Camp Number of People Served (Audience): 19
Location: West Virginia State University Number of ACS Student/Chapter Members: 5

Date: 2/18/2014
Name: West Virginia State University Day at the Legislature Number of People Served (Audience): 100

Location: Charleston, WV Number of ACS Student/Chapter Members: 6

Date: 12/4/2013
Name: Eastbrook Elementary School Number of People Served (Audience): 200
Location: Eastbrook Elementary Number of ACS Student/Chapter Members: 12

Date: 11/20/2013
Name: Red Cross Blood Drive Number of People Served (Audience): 126
Location: West Virginia State University Number of ACS Student/Chapter Members: 6

Date: 11/15/2013
Name: Brimhall Science Bowl Number of People Served (Audience): 77
Location: West Virginia State University Number of ACS Student/Chapter Members: 12

Date: 11/8/2013
Name: Gear Up program Number of People Served (Audience): 10500
Location: West Virginia State University Number of ACS Student/Chapter Members: 14

Date: 11/5/2013
Name: Cub Scout badge Number of People Served (Audience): 8
Location: West Virginia State University Number of ACS Student/Chapter Members: 2

Date: 10/24/2013
Name: Writing competitions (NCW) Number of People Served (Audience): 500
Location: Kanawha Valley Number of ACS Student/Chapter Members: 6

Date: 9/20/2013
Name: Hometown Elementary School Number of People Served (Audience): 100
Location: Hometown, WV Number of ACS Student/Chapter Members: 8