Chemistry

Program Review, July 2026

WILLIAM WOODS
UNIVERSITY

2025 Program Review

Chemistry Minor

Mission and Introduction

Introduction

1. Provide an overview of the program and the context of where it's housed within the institution (what department, etc.).
2. Discuss any changes in the focus of the program over the cycle of this review.

Narrative:

The Chemistry Minor at William Woods University is designed to provide students with some foundational understanding of chemical principles and laboratory techniques. Due to the university not having Chemistry as a major, there are five courses students must take in order to complete the minor. Students will take two semesters of General Chemistry, two semesters of Organic Chemistry, and one semester of Biochemistry. In regard to these courses, students will take the lab associated with it. There are 12 core credit that students must take. Next, students will have to take required elected up to 6 credits. Students usually will take Organic Chemistry II and Biochemistry with the corresponding labs.

Students gain practical laboratory experience and develop critical thinking and problem-solving skills related to chemical processes and scientific inquiry. The Chemistry minor is part of the School of Sciences and Health and this minor usually pairs Biology and Exercise Science.

There are no major changes within the program.

Program Mission Statement

1. What changes has the program made to the mission statement over the course of this cycle?
2. Why were these changes made?
3. Are any revisions planned?

Narrative:

There have not been any changes to the minor mission statement. No changes were made, and it is aligned to the university's mission.

Alignment to Institution Mission

1. How does the mission of the program align with the mission of the institution?

Narrative:

The mission of the program aligns with the mission of the institution in various ways:

1. The student-centered learning environment is important because the chemistry minor emphasizes foundation understanding, critical thinking, and practical applications. Due to having smaller class sizes and hands-on experiments, the program ensures that students will received the individual attention, which aligns with the university's commitment to personalized learning.

2. Both the missions highlight an emphasizes of intellectual inquiry. The minor aims to inspire a passion for scientific inquiry, which mimics the university's broader goal of encouraging curiosity.

3. Values of inclusion and creativity is vital, while chemistry is a structured science, the minor encourages creativity in problem-solving along with experimentation. Additionally, it supports inclusion by being accessible and relevant to a variety of majors. This enables students from a diverse background to engage with scientific learning. This minor reinforces the institution's mission by building a flexible learning experience that helps students to think critically and solve problems.

Service to the University (Contribution to Campus Climate)

1. What programming and organizational support are offered by the program that benefits the greater student population?
2. Does the program support on-ground/OLC General Education Courses?
3. Highlight any cross listed courses with other programs
4. Highlight any interdisciplinary programming or activities
5. Identify student enrichment programming that could include volunteer opportunities, field trips, workshops… (does not have to be specific to the program, but is beneficial to students on campus)

Narrative:

1. The chemistry program supports students beyond the minor through foundational coursework in general chemistry, organic chemistry, and biochemistry. The faculty is hoping to include a mentor-mentee project with a student in the near future.

2. Before arriving in Spring 24, the university offered General Chemistry I through Acadeum (an online consortium of colleges) due to the lack of a full-time faculty member. The university provided an in-person lab faculty to work with students face to face and help mediate the online difficulties. Even with the on ground support, this was less than successful. Chemistry is a General Education course - but the faculty are not looking to modify the course to online through the university due to the 5-week structure of the online sub-terms.

3. Chemistry at William Woods is tied to the Biology, and Exercise Science majors, which makes it naturally interdisciplinary. The minor specifically mentions biochemistry coursework and independent study projects, and the Biology program includes chemistry coursework within its requirements, showing strong overlap between programs.

5. One-on-one professor interaction, and research projects over different topics in chemistry are evidence of enrichment. The Biology program provides additional enrichment models of interaction that are being utilized within Chemistry as well.

Student Learning Outcomes Assessment and Curriculum

Program Student Learning Outcomes and Results

1. Describe how these Outcomes (Objectives) pertain to the program's mission. Have any changes been made to these outcomes over the course of this cycle? Why or why not?

2. Describe the extent to which students in the program have met these outcomes. Include a 5-year picture of the student outcomes with corresponding data that reflect the success or struggles in assessment.

Narrative:

> Program Objective 1: Demonstrate a fundamental understanding of chemical concepts relating to all branches of chemistry, including analytical, organic, physical, inorganic, and biochemistry.
>
> Program Objective 2: Demonstrate a thorough understanding of the periodic table of elements and how it can be used to determine trends in chemical reactivity and stability.
>
> Program Objective 3: Logically apply the scientific method to everyday situations in order to facilitate an understanding of the world around us.
>
> Program Objective 4: Integrate empirical evidence with experimental data, such that solid conclusions can be formulated.

1. Describe how these outcomes pertain to the program's mission. Have any changes been made to these outcomes over the course of this cycle? Why or why not?

Under Objective 1: Demonstrate a fundamental understanding of chemical concepts relating to all branches of chemistry, aligns well with the mission because it fits the university's mission of student-centered, profession-oriented education that values intellectual inquiry. Overall, it supports the kind of core chemistry foundation the program highlights for students in general, organic, and biochemistry coursework. Finally, it reflects the university's focus on preparing learners for success through applied education.

Under Objective 2: Understanding the Periodic Table and Trends in Reactivity and Stability: This objective aligns with the mission's emphasis on foundational chemical principles. Having a thorough understanding of the periodic table is key to chemistry education and serves as a critical took for predicting and explaining chemical behavior.

Under Objective 3: Application of Scientific Method to Real-World Situations: This outcome directly supports the mission's aim to inspire a passion for scientific inquiry. By applying the scientific method outside the classroom, students learn to evaluate everyday phenomena building curiosity and critical thinking.

Under Objective 4: Integration of Empirical Evidence with Experimental Data: This objective reinforces the mission's focus on developing problem-solving skills through evidence-based reasoning. This helps support the university's emphasis on intellectual inquiry and

professional preparation.

2. The available evidence from previous five-year assessments show chemistry students have generally MET program outcomes, but there are some students who did not. From the past data, it shows there is a rise in chemistry minors. During Fall of 2024, there was a small decrease, but with the increasing enrollment for Fall of 2025, there was an increase in Chemistry minors.

Fall of 21: 20
Fall of 22: 21
Fall of 23: 25
Fall of 24: 15
Fall of 25: 22

With a strong amount of students meeting the program objectives, this shows strong performance in chemical concepts, scientific reasoning, biology and physics connections, and data interpretation.

Over the past five years, chemistry enrollment and completion have generally trended upwards, and assessed student work shows that most outcomes are being met at or above the benchmark. With having a full-time faculty member, it has helped the university become more consistent.

Evidence:

- Chemistry Minor_2024-2025 Curriculum and Assessment Findings_2024-2025

Assessment Measures

1. Discuss the measures (rubric evaluation - tool used to gather information) you've selected or developed to measure for each Outcome (Objective).
2. Why were these measures chosen?
3. Were any measures or assessment instruments changed over the course of this cycle? Why or why not?
4. Note any action items related to assessment measures that will be changed moving forward due to the review of assessment data.

Narrative:

1. Measures:
    1) Analysis of Chemistry Article: This is a direct lab assignment where students will read a paper and it helps explain chemistry program objective 1 : Demonstrate a fundamental understanding of chemical concepts relating to all branches of chemistry, including analytical, organic, physical, inorganic, and biochemistry.
    2) Periodic Behavior of Metals: This is an experiment that will have students learn how to graph and analyze data based off the periodic table. This helps explain chemistry program objectives 2,3, and 4.

Both these measures were chosen because they best are aligned with the program objectives. These will be used for the future as well.

Measure 1 was added recently, because there was program objective 1 that still needed to be covered. This is the first time these measures were use and majority of the students MET the

expectations. These assignments clearly help students achieve understanding all the program objectives. Most students once they take the last semester of Chemistry have improved or have a very clear understanding of the four program objectives. The two measures will be used and more data will be collected to see if these two are appropriate for the chemistry minor.

The chemistry minor program uses the 2023 Natural Science GE Rubric and the Chemistry Rubric that was implemented last year, in order to assess program objectives.

The Article Summary is evaluated with the Chemistry Rubric and is used to measure Program Objective 1. The Periodic Behavior of Metals assignment is evaluated with both the 2023 Natural Science Rubric and the Chemistry Rubric and is used to measure Program Objectives 2, 3, and 4. 2025 was the first year, that all four objectives were met in quite some time. These two assignments were useful because they aligned well with the objectives for the minor and the university's Misson.

2. In the past, it has been difficult to keep a faculty member for the chemistry position. This five year report does not have five consecutive years of data. This is the first year that all four objectives were met and it is due to these assignments. These two assignments were useful because they aligned well with the objectives for the minor and the university's mission. It will be implemented in the future, until something will be adjusted if needed.

3. Last year, a chemistry rubric was written to help better fit to the chemistry minor. The assignments completed by students are geared toward the chemistry minor and the data collected is based off the chemistry rubric. During this assessment cycle, the programs implemented by rubric. This change was made to strengthen the alignment between student assignments and program objectives and to provided clearer evidence of student learning.

4. Moving forward, the program will continue using current rubric but will refine scoring criteria and alignment with outcomes as needed.

Evidence:

- Chemistry Minor_2024-2025 Curriculum and Assessment Findings_2024-2025

Curriculum Map

1. Highlighting any key or core courses, have any changes been made to this pathway or degree requirements over the course of this cycle? (Upload Program Checklist)
2. Why or why not?
3. Explain how the program sequence of courses is designed and why it is laid out in that way? (scaffolding)

Narrative:

1. The course pathway is built from basic to advanced topics, ensuring students develop both a conceptual understanding and practical laboratory skills.

1) General Chemistry I with Lab (CHM 114/115)

-This is the first semester of chemistry and covers atomic structure, stoichiometry, chemical bonding, gas laws, thermodynamics, and the theory about the periodic table.
-We will do basic lab techniques and follow safety rules.
-Supports Program Objective 1,2,3 and 4.

2) General Chemistry II with Lab (CHM 124/125)
-Expands on concepts from Gen Chem I with new topics such as thermodynamics, equilibrium, acid-base chemistry, and kinetics.
-Introduces more complex data analysis and experimental procedures.
-Supports Objectives 2 and 4

3) Organic Chemistry I with Lab (CHM 314/315)
-Focuses on carbon-based molecules, functional groups, reaction mechanisms, and different types of syntheses.
-Experiments emphasize identification and understanding different types of laboratory techniques such as melting points, recrystallization, and chromatography.
-Supports Objectives 2,3, and 4

3) Organic Chemistry II with Lab (CHM 324/325)
-Continuation of Organic Chem I, focuses on aromatic hydrocarbons, NMR, IR, Amine, Carboxylic Acids, and its Derivatives.
-Focus more on synthesis reactions and applications of instrumental techniques.
-Supports Objectives 2,3, and 4

No major changes have been made to the core pathway due to assessment data and the minor is flexible to students in biology, equestrian studies, and exercise science.

3. The course sequence is designed to move students from foundational chemistry to more advanced in a way that supports both conceptual understanding and laboratory competence. It begins with Gen Chem I and II, which introduces core principles and basic lab skills, and then progresses to Organic Chemistry I and II, where students apply these principles to carbon-based systems. This sequence reflects the way chemistry knowledge is typically scaffolded. No major changes have been made to the core sequence based on assessment data. Here, this suggests the program believes the current order is effective.

Evidence:

- Chemistry Minor Catalog

Concentrations

1. If the program has concentrations, please upload the concentration data.
2. Speak to the enrollment distribution of students within the concentrations and any impact on course rotation.
3. Include strategies or processes for retention and recruitment within the concentration.
4. Explain the value of each concentration and how they enhance the skills students need to be successful in the field.

Narrative:

N/A- the chemistry minor does not currently offer any formal concentrations.

Course Descriptions

1. Highlight any changes to course descriptions that have occurred over the identified timeframe. (upload a pdf of the course descriptions)

Narrative:

There have been no changes within the course description over the past five years. Chemistry is a standardized curriculum and the current descriptions align with other chemistry programs. Faculty work to cover the intent of each course and provide additional supplemental information when possible. The course are packed with information so it is already a time crunch to cover the material, but it is doable.

Evidence:

- Chem Minor Course Descriptions

Curriculum Delivery

1. Does online enrollment impact enrollment in the campus enrollment?
2. If the program has an online component, explain how the program coordinates schedules and curriculum between the two modalities.

Narrative:

There are no courses available for online. In Fall of 2023, General Chemistry I and Organic Chemistry I used an online portal for the courses and students performed poorly . It has not been a request by the student body, and it is not a priority of the current faculty to put chemistry courses online.

Participation in Assessment

1. Discuss faculty participation in program assessment
2. How involved are faculty and what is their responsibility for the assessment of the program.

Narrative:

1. The faculty will engage in several activities such as defining learning program objectives and developing assessment tools.

For the assessment process for the chemistry minor, it is important to follow the following steps:
1) Planning: The faculty will determine the learning outcomes.

2) Implementation: There are assessments given for the courses.
3) Evaluation: Students performance will be evaluated and there will be a set score percentage the students must aim for such as 70% or higher.
4) Documentation: The assessment is documented and the information will be saved for the institution.

2. The faculty will go through both rubric, align the data, and determine if the program objectives have been met or not. Afterwards, every year the faculty member will write an annual assessment. Five years later, they will write a report over the past five years.

Action Items and Use of Results

1. Summarize or highlight action items taken as a result of program's assessment results.
2. How have the results driven improvement over the course of this cycle?

Narrative:

1. This was the second year on these measures. The measures were created in order to align with the chemistry minor objectives and the university's mission statement. The results shown that from all the classes that majority for every class were MET which was above the anticipated target. Due to the percentage being higher, no actions were need to be performed. This year was the first time implementing an assignment that aligns with program objective 1. This assignment will be used for next year's evaluation as well.
The goal of these program assessments is to enhance student performance in the lab and learn how to structurally write a paper in the future. The program did not report major changes to instruction or assessment because the results were already above the anticipated target. The main step taken was to retain the current measures and use the implemented assignment for Program Objective 1 in the next assessment cycle.

2. The results drove improvement by confirming that the assessment structure is aligned with the chemistry minor objectives and the university mission statement. Even though no immediate interventions were needed, the data helped the program identify a useful new measure for Program Objective 1 and establish a clearer reference point for the future review.

Evidence:

- Chemistry Minor_2024-2025 Curriculum and Assessment Findings_2024-2025

General Education

1. • How does program coursework expand on the skills learned in General Education curriculum?

Narrative:

Program coursework expands on General Education by taking the broad skills students already have, which includes reading, writing, quantitative reasoning, and critical thinking, and applying them within a chemistry context. In the chemistry courses, students use those skills to interpret data, solve multi-step problems, write scientifically, and connect evidence to conclusions. General Education gives students a foundation in information literacy,

communication, and analysis, while chemistry asks them to use those skills in more specialized ways. For example, General Chemistry and Organic Chemistry require students to organize data, follow procedures, and explain results clearly in lab reports and written assignments. This is an important step because students are no longer only practicing general academic skills, but they are applying them to scientific evidence and laboratory observations. Chemistry coursework builds on general quantitative reasoning by asking students to do more than just perform calculations. Students must choose methods, interpret answers, and explain what those results means. Chemistry helps add experimental context, so students must connect formulas and concepts to observable outcomes within the lab. This will strength both their conceptual understanding and practical problem-solving.

Faculty Qualifications, Activities and Scholarship

Faculty Specialization

1. Discuss the scholarship and research content of the faculty in the program, being sure what their specialization brings to the program.
2. Explain the core features of the program based on the current faculty.
3. How could the program be expanded (new courses, areas of specialization, etc.)?
4. How might additional instructional members allow the program to expand and/or change the focus of the program curriculum?

Narrative:

1. This has not been done yet. Faculty hope to participate the mentor-mentee project in the distant future. There is also a class within the program that focuses on advanced projects and independent study options.

2. Currently, the chemistry program's core features are foundational coursework, lab-based instruction, small class sizes, mentoring, and flexible elective pathways. The curriculum centers on General Chemistry, Organic Chemistry, and Biochemistry related experiences, with independent study and advanced projects available for students who want deeper engagement. The program's goal is to make sure students are well suited to students preparing for medical school, graduate study, or science-related careers.

3. With additional human resources the program could expand by adding specialized coursework; including analytical chemistry, physical chemistry, environmental chemistry, and an advanced biochemistry course.

4. Additional instructional members would likely allow the program to offer more upper-level courses, rotate electives more consistently, give a chance to teach a new course based off what students would like to learn more, and support more student research projects at the same time. If a new faculty member brought expertise in a subdiscipline such as analytical chemistry or biochemistry, the program could add a new elective and strength the labs themselves. It would be nice if senior year students were able to do a capstone course.

Faculty Awards and Honors

1. Discuss and highlight awards and honors received by faculty over the course of the cycle.

Narrative:

From the past faculty member, "I wrote all new lab experiments for all chemistry courses to better incorporate what they will see in professional life or graduate school while also offering many real life labs. This task not only required time to dive into the literature but also actively testing experiments for their usability and time constraints." She also volunteered with science communication and outreach. She participated in the New Faculty Workshop put on by the American Chemical Society in June.

Currently, no honors or rewards have been received by the current faculty member besides the nomination for the Beaumont Faculty Award. The full time faculty for Chemistry is currently pursing the EdD and hoping to finish in December.

Faculty Workload

1. Summarize the workload and responsibilities of faculty.
2. What actions are you taking to avoid faculty overload?
3. % of course load is taught by program faculty vs adjunct
4. % of courses covered by full time faculty
5. % of courses covered through faculty overload

Narrative:

1. Faculty responsibilities include teaching chemistry lectures and labs, advising and mentoring students, supervising research for students, assessing student learning, and supporting program-level service and curriculum work.

2. There are no actions taken. Faculty are currently overloaded every semester to fill the available courses. Fall of 2025, there were more students taking General Chemistry I and we had to adjunct one of the labs due to the overload. In the Spring of 2026, Biochemistry lab was cover with an adjunct as the full time faculty was maxed on the courses they could teach. The overload issue is systemic and not something that can be fixed easily. There are too many course that need to be taught, and the additional component of labs, make it hard to cover all the courses. The program would benefit from additional faculty to assist with lecture and lab courses. This would assist with burnout concerns, but also benefit students to have additional pedagogy perspectives in the classroom.

3. There have been only 2 courses taught by adjuncts for the past few years. In Spring of 2024, there was an adjunct teaching General Chemistry 2 lab at 6 pm. In Fall of 2025, there was an adjunct teaching General Chemistry 1 course at 2 pm. Besides that, the faculty has taught every other course since. Adjuncts are called in when they must teach if the full-time faculty has exceed the overload. Not including overload, the full-time faculty member has taught 100% courses.

4. The full time faculty has taught 27 courses/30 courses – making the percentages as such: 90% has been taught by full-time faculty member while 10% by adjuncts.

5. As previously mentioned, 90% has been taught by full-time faculty member while 10% by adjuncts.

Program Data: Student Experience

Enrollment and Recruitment

1. What are the trends with enrollment in this program over the course of the review cycle?
2. How does this compare to institutional trends or similar programs on campus?
3. Describe recruitment efforts or goals such as increased enrollment.
4. Have these initiatives been successful?

Narrative:

1.

Fall of 21: 20
Fall of 22: 21
Fall of 23: 25
Fall of 24: 15
Fall of 25: 22

Science faculty are doing a great job promoting the chemistry minor to students. This year, when it comes to advising, there is an increase in number of chemistry minors now. There are two Exercise Science students that recently added a chemistry minor due to the recommendation of the science faculty.

Faculty will continue to promote the chemistry minor if students are biology majors as well, specifically if they are premed majors. We saw a small increases from Fall of 24 to Fall of 25.

This data was based off the excel sheet based off Institutional Activity Report.

2. Biology faculty and chemistry faculty have worked together to encourage students to add the minor, which supports overall enrollment growth in the program. This year's advising efforts also resulted in two exercise science students choosing the chemistry minor, showing that the minor appeals beyond biology majors. Most students who are Biology majors are usually minoring in Chemistry.

3. Current recruitment efforts focus on encouraging biology majors, especially pre-med students or pre-vet to consider the chemistry minor to strengthen their academic plan. The program is also being promoted to exercise science students and other students whose career goals may benefit from a chemistry background. Overall, these efforts are intended to increases overall enrollment in the minor and strengthen connections between chemistry and other science related majors.

4. These initiatives appear to be having a positive effect. The increase from Fall 2024 to Fall 2025 suggests that advising and faculty promotion are helping stabilize and grow enrollment after the decline in Fall 2024. The addition of two exercise science students further indicates that targeted recruitment is broadening the reach of the minor.

Retention

1. Has student retention remained in an acceptable range over the course of the review cycle?
2. What strategies are program faculty using to raise retention rates within the program?

Narrative:

1.
Fall of 24: 15
Fall of 25: 22

1. Fall of 2024 had a major decrease from pervious year (Fall of 2023) of 25 to now 15. We can expect that since the enrollment numbers for the university are increasing that more students will be taking chemistry courses. I would say besides that one year, the data from Fall of 2021-Fall of 2024, it has been in the acceptable range.

2. If the General Chemistry I course can be a fun and exciting course, this can have students want to take another year of it. The courses are challenging already, but trying to incorporate fun experiments and projects could interest students more in science. There is a possible chance I will try and run a LEAD event to get more students interested in Science. This can draw more students to take the first semester of chemistry.

There was a student from the school of business who took the General Chemistry I course as well.

The normal distribution of students who take this course are biology majors and exercise science majors.

As more biology students come in, this will increase the numbers within the chemistry minor.

Curriculum/Course Retention and Success

1. Describe enrollment trends in the courses within the program. (upload course enrollment spreadsheet)

2. Reflect on the success of the students within the courses over the designated time frame.
- Highlight some completion or withdrawal and failure rates in the core courses.
- Were these in line with expectations? (we will need to provide this data)

3. For programs with dual modalities, reflect on the success of students within the courses over the designated time frame.
- Highlight some completion or withdrawal and failure rates in the core courses.
- Were these in line with expectations? (we will need to provide this data)

Narrative:

1. Enrollment was the strongest in the foundation courses which were General Chemistry I and II and their corresponding labs. This consistently carried the largest student counts across the review period. Gen Chem I enrollment ranged from 28-41 students in most terms, while the labs followed a similar pattern. Organic Chemistry I and its lab generally enrolled fewer students than General Chemistry, with class sizes typically in the teens, which is expected for an upper-level course sequence. Organic Chemistry II had the smallest enrollments of the core sequence, often enrolling around 5 to 12 students. Biochemistry and lab show a moderate enrollment, typically ranging from 7 to 18 students. Overall, the course pattern shows a predictable progression of high enrollment in introductory courses, moderate enrollment in Organic Chemistry I and Biochemistry, and lower enrollment in Organic Chemistry II.

2. I only have access to the enrollment count, it does not include completion, withdrawal, or failure data, so it is hard to give an exact number. Since I have started from Spring of 2024, there have only been 3 official "F's" within the courses. In Spring 2026, there were two "F's" in General Chemistry II and one "F" in Organic Chemistry II. I am unsure on the data from 2020-2023 since I do not have who passed and who did not. At least 98% of students have passed the courses I have taught. If we focus on only lecture from the time I started in Spring of 2024, I have taught 208 students, just in terms of lecture not lab. 205 students have passed with a "D" or higher. I do not have any data that supports this besides the number of students I have had in the lecture courses. There needs to be a separate grade or withdrawal report is needed to evaluate student success over time.

3. There are no online sections for this course. No dual-modality comparison is available from the current file.

Evidence:

- Chemistry Course Enrollment

Completion

1. How many students are graduating from the program?
Have the completion rates been in line with expectations?

2. Describe findings resulting from exit surveys or program alumni surveys that were conducted over the course of the cycle. (programs will need to do annual exit surveys to capture this data)

Narrative:

1. This is a chemistry minor not a chemistry major. I am unsure where the data is to see if they completed their chemistry minor. From the past five semesters I can say, there will be around 20 students who will have their chemistry minor completed since I have started in Spring 24. This data is based off not just graduating but transferring. The only issue that arises is that most universities need another chemistry course for the minor. At William Woods, Biochemistry is the last part of their minor. However, at Mizzou, they have the same courses as well but they will need to take another lecture course such as Inorganic Chemistry, Analytical Chemistry, or another course. However, majority universities make sure students take at least 15-18 credits for the minor.

2. Due to not being a major, we do not do any EXIT surveys. However, at times students will mention their experience about the chemistry courses when they do their EXIT surveys for Biology.

Course Evaluation Data

1. What were some positive and negative feedback received from students who completed the courses?

2. Highlight any trends or insights that came from course evaluations over the course of the cycle. (data will have to be available)

Narrative:

1. Positive Feedback: Majority of the students mentioned the office hour availability was extremely helpful. Additionally, they realize the time I put in for students to make sure they learn material is also noted and they mentioned they have a lot of resources provided.

Negative Feedback: The way I write questions is confusing at times. Additionally, the material is way more challenging than anticipated.

Majority of the feedback has always been positive. Students realize I have spent numerous hours to help them and will be able to help them via email or in person.

2. Majority of the evaluations had positives of 1) Available for extra help if needed, 2) Treats students fairly,
3) Demonstrates enthusiasm for the subject. There are others as well, but here are the few that is consistent every semester.

Student Advising

1. Describe the advising process for your program?
2. What strategies and structures are in place to facilitate a successful advising period?
3. What is the optimal ratio of advisees to adviser for the program?
4. Explain any other processes to increase the effectiveness of the current advising procedure.

Narrative:

1. For on ground students, advising is coordinated through the science department with exercise science, biology, equestrian, and chemistry faculty serving as primary academic advisors. Advisors help students determine the appropriate sequence of major and minor courses and plan when chemistry courses should be taken. Some students with whom I work are pursuing the chemistry minor so advising also includes helping them understand how the minor fits with their major requirements.

2. Faculty advisors are familiar with student degree plans and can guide course sequencing in a way that prevents students from taking chemistry courses too early or out of order. Because advising is housed with the science department, students receive guidance from faculty who understand the connections with biology, exercise science, equestrian studies, and chemistry. This will allow advising to better align with students goals.

3. The university does not have a chemistry program, only a minor. Faculty advisee Biology students and explained how the chemistry minor works. On average, there are 20 students a semester who minor in chemistry. Students are free to ask any science faculty member about the chemistry minor. The typical advising load is: 15-20 students.

4. Chemistry is emphasized to pre-med majors and other science-oriented students that a chemistry minor looks strong for their graduate applications. Students who go to medical school will need to take the MCAT so taking a chemistry minor would be the best path for them to prepare for their MCAT.

Student Awards and Achievements

1. Highlight the accomplishments and external honors received by students in the program over the course of this cycle.

Narrative:

1. The chemistry minor has no particular accomplishments besides students earning their minor.

Clubs and Co-Curricular

1. Does your program support any clubs and co-curricular activities that contribute to positive student experiences?
2. How does this contribute to the program?
3. To the campus experience of students?

Narrative:

There are no current clubs that the program supports. In the future, there might be a club geared towards premed's. This club would focus on helping students prepare for medical school through different guest speakers, MCAT support, shadowing and volunteering opportunities and study groups.

Program Analysis

SWOT Analysis

1. Strengths, Weaknesses, Opportunities, and Threats.

Narrative:

1) Strengths
1. Having Strong Faculty Engagement: Faculty are involved in assessment, curriculum development, and continuous improvement based on the student data.
2. Hands-on Lab Experience: Students will improve their practical skills and scientific understanding in the labs.
3. Flexible Course Design: The minor complements many majors such as Biology, Exercise Science, and Education. This can make it more open to non-chemistry majors and minors.

2) Weaknesses
1. Low Awareness: there is evidence that students in relevant majors are sometimes unaware how this minor can be beneficial to their career.
2. Limited Course Offering: As a minor, the program does not have many upper-division courses where students can learn more specialized content.

3) Opportunities
1. Hybrid Labs: Incorporating virtual labs can increase accessibility.
2. Interdisciplinary Collaboration: Linking with public heath, environmental, or forensic science could expand the minors relevance.

4) Threats

1. Competition from Other Institutions: Nearby schools may offer stronger chemistry programs and draw potential students away.
2) Budget Constraints: Lab equipment may be limited or expensive affecting the ability to expand.

Campus Facility and Resources

1. Provide an analysis on how adequate the spaces that are most used by the program on campus (laboratories, office space, classrooms/LMS, etc.).
2. Please discuss any updates or modifications to the facility or resources available to the program that have impacted student learning.
3. Recommendations to Improve Facilities and Resources

Narrative:

1. The spaces most used by the program appear to be adequate enough for current instructional needs, specifically the laboratory room. Chemistry instruction depends heavily on well-equipped labs, appropriate storage, functional classroom technology, and office space for advising. There is enough room to be successful for the chemistry courses. LMS works well enough for students as every week things are posted.

2. No major updates that have impacted student learning.

3. The lab room needs to be organized better if possible and there should be a professional to come in and clean the lab, but we do not have the appropriate budget. It would be great to have more resources for the teaching labs with updated instruments. Faculty work to make sure the labs are workable with the materials available. Faculty use the chemistry budget to order materials, but sometimes creativity is required when there is not enough to purchase the desired materials.

Library Report

* Upload the Library report provided by the University Library

1. Please describe the usage of library resources.
2. How do faculty and students feel the library meets the program's needs?

Narrative:

1. There are numerous usages provided by the sheet that was uploaded. Faculty will inform students of the library resources. This will be useful for students to checkout from the library. Through the sheet uploaded, it shows it is strong through digital access rather than print access. The chemistry collection analysis shows that William Woods has 72 print chemistry books, but there is far more access through eBooks, journals, and databases.

2. Faculty and students can benefit from Woods OneSearch, selected chemistry-related databases, and MOBIUS lending. Students nowadays are focused on digital materials. The collection development is intentionally focused on up-to-date digital resources, which is appropriate for undergraduate chemistry.

Evidence:

- Library Collection Analysis-Chemistry

Cost Analysis

1. What was the annual budget for the program for the past 5 years?
2. How was the budget spent? (breakdown of budget expenses)

Narrative:

1. The annual budget for the program has been $3000 for the past five years. This is used to keep the chemistry lab updated and operational.

2. Some of the items bought with the budget over the last five years include:

a. Waste beakers for solvents to be disposed properly and safely.
b. Different solid powders used for experiments such as Sodium Chloride, Sodium bicarbonate, and sucrose. We use these salts quite frequently in different chemistry courses as well.
c. Different organic solvents such as 2-napthol, petroleum ether, different type of acids that are premade, and acetic anhydride.
d. Glass waste bags. Here, students are able to dispose broken glass safely.
e. Other items include rubber bands, rulers, aluminum foil, Pipette bulbs, stir rods, and beakers at times.
f. pH strips and pH sticks to read the pH levels has been bought in the past.
g. One experiment we work with numerous metals so I will buy different metals such as Copper, Zinc, Magnesium, Calcium, and so on. We use this is another lab as well.

The biggest need for the chemistry lab is the removal of the organic and aqueous waste that has accumulated over the years. Faculty have reached out to several companies to help with dispose these chemicals. The quotes provided were over $7000 for properly disposal of the waste. There are also numerous chemicals in bottles that had no labels, and faculty are not able to properly identify them. The current available budget does not allow for disposal of the waste and purchasing what is needed to run the labs for the academic year.

Faculty adapt experiments to fit the appropriate budget while ensuring students gain a positive learning experience. At times, students have mentioned they want to do more when it comes to more advanced experiences, but they understand that we do not have the most updated equipment.

Specialty Accreditation

Does the program hold specialty accreditation?

If yes, please include the name of the accrediting body and upload the most recent accreditation letter. (description of the data points – describe the accreditation cycle– identify any points of concern noted on the most recent accreditation)

Narrative:

The chemistry minor does not hold separate specialty accreditation.

Industry and Program Trends

Analysis of the Discipline

1. Provide context for the status of the discipline today.
2. What are some emerging trends in this discipline across the country?
3. What is happening in the industries related to this discipline?

Narrative:

1. Chemistry remains a foundational science because it connects directly to real-world problems in health, energy, agriculture, environment, and medicine. In higher education and research, the discipline is also becoming more interdisciplinary, with stronger links to biology, physics, and engineering. For a chemistry minor, this means students are being prepared for careers and graduate pathways that value both scientific context and practical problem solving. Overall, the discipline of chemistry remains highly relevant today.

2. A major national trend is sustainable chemistry, which includes lower-waste reactions, renewable feedstocks, and energy-efficient processes. Another important trend is the rise of AI-assisted chemistry, specifically in protein design, drug discovery, prediction tools, and overall reactions. The field is seeing strong interests in targeted protein degraders, radiopharmaceuticals, and battery materials. Chemistry is increasingly taught with more real-world application.

3. Chemistry-related industries are active in pharmaceuticals, biotechnology, advanced materials, energy storage, and chemical manufacturing. Energy and climate-related industries are also expanding with major interest in batteries, fuel cells, electrolysis to name a few.

Comparison to Similar Programs at Peer Institutions

1. Identify and discuss how similar programs compare to your program in terms of size, curriculum and any relevant attributes.

Narrative:

1. Similar chemistry programs are typically small minors built around the classes of General Chemistry, Organic Chemistry, Biochemistry, and related lab work. Compared with larger universities, the program is smaller in enrollment, so it is limited on the course that are offered compared to other universities such as University of Missouri, Columbia College, and Westminster who have a chemistry degree. At William Woods, chemistry is a minor only, which makes it smaller than chemistry departments at institutions offering a full major. The library sheet uploaded does not require a large print collection so this fits a small program model with moderate enrollment and a focus on digital resources.

The curriculum is fairly typical which includes courses in General Chemistry, Organic Chemistry, Biochemistry, and related lab work. However, larger programs will add Analytical Chemistry, Physical Chemistry, Instrumental Analysis, and Inorganic Chemistry. The focus at William Woods is based on the foundational content useful for biology, pre-med, exercise science, and related majors.

A key attribute to this program is flexibility. It is designed to serve students from multiple majors rather than chemistry majors alone, which is common at smaller schools and liberal arts settings. Additionally, close faculty contact, mentoring, and advising is easier to maintain in the small program.

Senior Exit Surveys

1. What were some positive and negative feedback received from students as they complete their degrees?

2. Highlight any trends or insights that came from exit surveys over the course of the cycle.

Narrative:

No exit surveys were given for the chemistry minor.

Graduate/Alumni Feedback on the Program

1. What were some positive and negative feedback received from alumni?

2. Highlight any trends or insights that came from alumni feedback over the course of the cycle.

Narrative:

No feedback was collected over the reporting period.

Recommendations from Previous Program Reviews

1. Summarize recommendations from previous PRs, describe how those recommendations were applied throughout this cycle.

Narrative:

There has been a large gap in assessment between reviews and changes to the program. The previous review was not available for review.

Industry Relevance and Employment

1. How do your student learning outcomes align with industry needs?

Narrative:

Student learning outcomes in chemistry align well with industry needs because they emphasize the same capabilities employers and graduate programs expect. These include problem solving, laboratory technique, data analysis, scientific communication, safety, and use of chemical information resources.

The strongest alignment is in laboratory practice and analytical thinking. Industry needs graduates who can follow safe procedures, use instrumentation, analyze data, and report results accurately, which are important learning outcomes in the chemistry that other universities also strive to teach. Additionally, communication is important because employers want graduates who can write and speak about technical materials clearly, collaborate with others, and be able to explain results to both scientific and non-scientific audiences.

Overall, the curriculum's focus on applied problem solving communication reflects current expectations in chemistry related industries where employers seek graduates who can work safely, interpret data, use resources properly, and collaborate effectively.

Employment Outlook

1. Describe employment outlook for the degree.
2. What types of employment would constitute working "in the field?"
3. Are there changes to program offerings and activities that would improve the employment outlook for graduates?

Narrative:

1. Describe employment outlook for the degree.

The chemistry minor supports employment and graduate school preparation by giving students a strong foundation in general chemistry, organic chemistry, and biochemistry. This coursework aligns well with pre-med, biology, and exercise science students who plan to enter health professions, laboratory work, or graduate study. The minor strengthens scientific reasoning, lab skills, and content knowledge that are useful in both employment settings and professional school pathways.

In regard to the students, most students either will go to medical school, physical therapy, or do something in terms of Biology such as field work or graduate school for research such as microbiology or immunology. According to Labor Market Overview, there is an increase of around 5,300 jobs with an average of $34.24 median earnings per hour. The Biological Scientists has more opportunities to apply in different industries, includes healthcare, biotechnology, pharmaceuticals, and environmental conservation.

Labor Market Overview

View the key labor market data for your region compared to national data.

5,299 Jobs in 2025 64% Below National Average	0.5% Change from 2025-2030 +4.2% National Change	$34.24 Median Earnings per Hour $41.98/hr. National Median	443 Annual Openings 72% Below National Average

OCCUPATION	2025 JOBS	Growth (2025-2030)	MEDIAN EARNINGS	ANNUAL OPENINGS
Biological Scientists, All Other	3,812	0.79%	$33.7/hr.	309
Microbiologists	690	3.91%	$35.23/hr.	64
Zoologists and Wildlife Biologists	797	3.39%	$34.24/hr.	70

Source: Lightcast

2. What types of employment would constitute working "in the field?"
There are careers in healthcare, pharmacy-related field, laboratory science, environmental testing, quality control, and graduate or professional study that leads to different scientific works. Due to this being a chemistry minor, many students will enter field related work through health professions or lab-based careers rather than just some chemistry title.

3. Are there changes to program offerings and activities that would improve the employment outlook for graduates?
No changes planned at this time.

Summary

The chemistry minor aligns well with the university's mission because it supports a student-centered, professions-oriented education that values intellectual inquiry, hands on learning, and prepares students for their careers and graduate study. The curriculum is a good fit for the university's emphasis on flexible and academic rigor. Student learning appears to be supported by a curriculum moves from foundational chemistry to more advanced lab and analytical work, and the assessment data show that most outcomes are being met at or above benchmark. The student experience is strengthened by small classes, has access to digital library resources, and the ability to fit the minor into biology, pre-med, and exercise science pathways.

The program's facilities and resources appear adequate for its current size with laboratories classrooms. There is a strong support for the usage of the library because students have access to chemistry databases, journals if need be.

The program is also responding to broader discipline trends by emphasizing foundational chemistry and pathways into health professions. This should be consistent with national trends toward sustainability, applied problem solving, and stronger links between chemistry and medicine.

Overall, the program is aligned with the university mission, produces a strong student learning in a flexible minor and is supported by numerous faculty and adequate resources as it seeks to give students the best opportunity to learn.

Academic Council Review

Academic Council Response

Academic Council will review the report in its entirety and come together to discuss any remaining questions or concerns. The council will highlight noted areas of improvement for program focus. Issues of resources are discussed if additional resources are needed to implement improvements noted by the Reviewer, the faculty or Academic Council.

Narrative:

Academic Council was provided the report in advance and met to review the Program Review in July 2026. The following comments are recommendations - support from Academic Council on how to strengthen the program as well as issues of challenge that might need to be addressed.

Strengths:

- The Chemistry program has a plan moving forward and has started assessment of program objectives. The program created a rubric for the objectives which will assist in streamlining the assessment moving forward.
- The review is thorough and candid, with clear evidence of assessment activity, including the newly developed Chemistry Rubric and two aligned measures.
- The review includes enrollment data across five years, and a curriculum map clearly explains course scaffolding from foundational to advanced coursework.
- The faculty member's transparency about workload, budget constraints, and past online course challenges is commendable. The faculty is invested in the program, strong advising practices, and the success of the Chemistry and related Biology program.
- The SWOT analysis and Labor Market Review are realistic and well-considered.
- The courses and minor play a vital role in preparing successful candidates for medical and veterinary schools. Not only does the minor improve their application, but the coursework builds the foundation they need for the next educational step.

Weaknesses:

- Due to the changes in faculty and the subsequent lack of a full-time faculty, the assessment data for the program is lacking and inconsistent. Current faculty are working to fix the issue, but the fact is that there is not a solid set of data available for the report.
- The program needs to identify clear strategies on how to raise awareness to the program.
- The report could expand the overloads and show the data in black and white to support the argument for additional faculty.
- In the report, make sure to note that equestrian students are actually Biology Pre-Vet students. The focus for why they are in chemistry is due to the pre-vet component of their studies and not equestrian riding.
- It is challenging to find data on student success for minors, but the program could claim Chemistry minors who were successful applicants to veterinary school as a student's achievement to highlight.
- It is helpful to link supporting evidence when making claims of success or engagement. When noting “Service to the university” for example – there are ways to document the service provided.

- Assessment results are described qualitatively but lack specific benchmark data and percentages – more specific expectations on student success would benefit the section. It would also provide an easier transition to data visualization to showcase where students are successfully showcasing the skills necessary for a Chemistry minor.

Action plan:

- The program should look at specific program needs - shortcomings of the building, equipment, and resources and provide a proposal in order of preference and need to assist in prioritizing needs of the program should funds become available. Work with the Dean of the School and business services to explore obtaining large purchases of necessary lab equipment. This also benefits the program so that needs are documented in advance and easy to find for reference.
- The faculty should also propose the benefit/cost/analysis of bringing on a chemistry lab adjunct. Being able to articulate the benefits to the program is critical. This position would assist with the faculty load, but also it is beneficial for students to hear the material from more than one approach. Work with the Dean to propose an adjunct lab faculty
- The possibility of burn-out is real when the schedule is overloaded, semester after semester. Think outside the box to see if there are other options available for scheduling or curriculum to reduce the overload for faculty.