Agenda and Evaluation Report for
Audit & Review Face-to-Face Meeting
University of Wisconsin-Whitewater
Chemistry Majors and Minors, 2021-2022

Date: 5/12/2022
Time: 2:30-3:30
Place: LT 4120

Invited: Interim Provost Robin Fox; Dean Frank Goza (L&S); Department Chair/Program Coordinator John Ejnik; faculty and staff in the Chemistry program Paul House, Kim Naber, Julia Rowehl, Audit & Review Team Chair Eric Appleton; Audit & Review team member Fe Evangelista, Assessment Representative Katy Casey

1) Call to order 2:34

2) Introductions

3) Overview of review team evaluation, program comments

4) Discussion of Review Team's evaluation:

   a) The assessment plan included a lot of detail, and yet was missing a structure of long-term planning such as a timeline. It would be helpful to understand the program's planning process and how course and accreditation data is used in the program review process.
      i) The program reported challenges in finding times to meet and discuss data use, most data is collected in courses by individual instructors in an on-going and continual basis
      ii) Chemistry is an accredited program and plans curriculum around ACS guidelines- which are designed so students who graduate are prepared for graduate school. ACS does not require assessment of student learning outcomes but recommends exams to measure students' progress compared to other students across the country.
      iii) Instructors review the exam scores and use that information to make decisions about what content to cover and/or review

   b) Enrollment has had a rather dramatic decrease, but is noted to reflect both statewide and national trends. It's also noted that lower enrollment levels have actually contributed to the vitality of the department in terms of available resources and staffing (they were understaffed at enrollment peak in 16-17). Does the program anticipate current enrollment holding? Any concerns related to recruitment or retention?
      i) The program lost some positions in addition to decreasing enrollment, so it evened out in terms of resources
      ii) The program teaches courses at 100 and 200 level for Biology and Safety
      iii) Optimal number of students is 100- program is discussing another program that may attract new students, such as a focus on homeopathy
      iv) Advisory board meeting scheduled to discuss programming,
      v) Another idea to address enrollment is to create 1-credit courses that may be of interest to those seeking professional development offerings
      vi) Dean Goza asked about moving the program online- the program feels they could offer that option, but it was not received well in the past by the advisory board. Concern seems to be completing labs, which is proven to be the most valuable learning experience for students (reported by alums). Some face to face lab options (augmenting online instruction) have been attempted but there's no data at this point that they were particularly successful. Sessions were popular with pre-med students from UW-Madison.
      vii) Interim Provost Fox asked if any technical colleges feed into the chemistry program? Dean Goza shared information on a transfer agreement for those with an Associate Degree
      viii) The College is supportive of equipment needs and purchases supplies and materials needed to run program.

ix) One draw of program is that the students get hands-on experience using equipment, which is not common in other programs.

x) Facilities are managed by faculty in the program, which is a cost savings and significant load in terms of management.

xi) There are two large lecture halls in Upham that can be difficult to schedule classes in once in a while; if enrolling increases demands for these halls will increase (among the departments requiring them); extremely difficult to move needed demonstration materials to lecture halls outside of Upham

Interim Provost Fox noted the interest and unique nature of homeopathy- in the region. Dean Goza brought up the Integrated Science and Business program, which is also unique in the system and region. Appleton noted that the hands-on nature of the lab preparation and equipment maintenance was a unique feature that gives our graduates an edge. Also mentioned by the department is the practice of including undergraduates on research projects that result in publication with students listed as co-authors.

5) **Recommended Actions**: The evaluation report lists two recommended actions (see page 12, item 4) related to Assessment Planning and Program Goal Description.

6) **Recommended Result**: *Continuation with minor concerns*
   - **Please make use of the detailed comments in the evaluation report (below).**
   - **A progress report on the Assessment Plan is requested. The committee requests the program use the assessment plan template; no data is required. The plan is requested to enable its use at the time of the program's next full-self-study.**
   - **Please select all applicable boxes and fill in the appropriate year:**
     ☒ **Next FULL self-study will be due to the Dean on October 1, 2026, and to the Assessment Office on November 1, 2026**
     ☐ **Next SHORT self-study will be due to the Dean on October 1, 2024 and to the Assessment Office on November 1, 2024.**
     ☒ **A progress report will be due October 1, 2023 to the Dean, and November 1, 2023 to the Office of Academic Assessment**

7) Adjourn 3:30

Review team report is attached below, including Recommended Actions and instructions for Progress Reports (if required).

University of Wisconsin-Whitewater
Committee Form: Review of Audit & Review Self-Studies
Undergraduate Programs, 2021-2022
Majors/Minors and Standalone Minors

Date of Evaluation _____4/20/2022_____Short Self Study (SS*)_____
Program:___**Chemistry**_____ ____ _____   Major ☒   Minor ☐

Evaluations submitted by: Bruce Cohen, Eric Appleton, Katy Casey, Fe Evangelista, and Tom Klubertanz
Review meeting attended by: Bruce Cohen, Eric Appleton, Katy Casey, Fe Evangelista, and Tom Klubertanz

I. General Program Information

1. The program's mission statement reflects the nature and scope

Sufficient Evidence	4
Some/Partial Evidence	1
No/Limited Evidence	0

2. The program is aware and reflective of changes affecting improvement since the last review.

Sufficient Evidence	3
Some/Partial Evidence	2
No/Limited Evidence	0
First self-study for the program	0

3. Characteristics of the program set it apart from others when compared regionally and nationally. The unique aspects of the program attract students.

Sufficient Evidence	3
Some/Partial Evidence	2
No/Limited Evidence	0

4. The program has been responsive to actions recommended from the previous Audit and Review Reports; Progress Reports have been submitted, if relevant.

Sufficient Evidence	2
Some/Partial Evidence	3
No/Limited Evidence	0
First self-study for the program	0

5. The program has achieved or maintained program-level accreditation or has considered seeking it, where appropriate (only select N/A if there is no accreditation available).

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

	N/A	0

General Comments related to Section I

More detail would be appreciated. There are some goals left unaddressed (assessment).

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3.   The program described the strengths of the program and characteristics that make it attractive to students.   It would be helpful to get some context as to whether these characteristics are unique in regional programs of similar size.

4. Lots of data, lots of analysis; there appears to be much reflection and understanding of how each course fits into the curriculum. Action plans based on the data collected are noted throughout. However, I'm not sure I saw evidence of an overall assessment "plan" -- what SLOs are to be evaluated in what order and when? Right now, it seems as though everything is being analyzed concurrently, and my fear is that assessment will become an unwieldy, constant burden. The curricular maps are very comprehensive, but it would be useful to exchange the "X"s for a designation noting Introduced, Developed, Demonstrate Mastery to better see how the courses correspond to each SLO.

4. The program SLOs were mapped to courses, but it is still not clear how the tests (ACS, MFT) are used to assess the SLOs.

II. Alignment within the University

1. The program contributes to the fulfillment of UW-Whitewater's Mission and Strategic Plan.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

2. The program supports general education and/or proficiency programs at the University.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

3. The program is collaborative and supports other academic programs across the College and/or University.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

General Comments related to Section II

There is clear evidence of the program's validity.

1. The program demonstrated clear alignment between the program mission and institutional goals. The program noted strategies the believe align to student success in their program (UGR, grading practices, faculty outreach). Has there been information collected, or analyzed, to determine if these actions do in fact support retention and graduation?

2. How well does the program do at meeting GE proficiency? How do Chemistry students perform on critical thinking, problem solving?

2. Presence of three GL courses.

3. Math and Physics are noted as required for Chem majors; Chemistry courses are required as part of Environmental Studies, physics and biology majors, and the Integrated Science Business major. Medical, veterinary, pharmacy, other advanced training often requires chemistry knowledge.

2.3. The program supports general education by offering lab courses.   They also support programs in other Colleges.

III. Program Goals & Accomplishments

1. Goals and objectives were identified and undertaken to improve/advance the program.

Sufficient Evidence	3
Some/Partial Evidence	2
No/Limited Evidence	0

2. Goals currently in place will contribute to the program's advancement. Criteria for determining success were measurable and attainable.

Sufficient Evidence	2
Some/Partial Evidence	3
No/Limited Evidence	0

3. The program has a process for setting and assessing goals and making decision about changes to the program.

Sufficient Evidence	2
Some/Partial Evidence	3
No/Limited Evidence	0

General Comments related to Section III

While the progress made is commendable, there are a number of areas/goals unaddressed.

1. Current program goals appear to be specific and achievable, as well as based upon data collected through assessment efforts.

2. The list provided is not current.

1 and 2. Congratulations for another 5-year recertification. Goals were identified but it would be helpful to know how completion of the goals advanced the program.   The goal(s) related to the assessment plan still need to be completed.

3. A particular process was not outlined, but a number of bodies that are consulted in the development of goals was noted. "Sources of data are reviewed at department meetings and discussed."

IV. Curriculum

1. The program has a clearly articulated, efficient, and purposeful curriculum.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

2. The program prepares students in majors, minors, and related emphases tracks in post-graduation and other applicable experiences.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

3. Appropriate assessment data were used in making curricular revisions.

Sufficient Evidence	4
Some/Partial Evidence	1
No/Limited Evidence	0

4. Students participate in the high impact practices.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

General Comments related to Section IV

This is a well-supported and documented section. Thank you for the clarity.
2. It appears that ACS guidelines and criteria are very useful in laying out professional career tracks for students, and that the program has a high degree of understanding of how various courses serve a student's future career.
4. Students have various opportunities to engage in HIPs.   This is a strength of this program.

V. Assessment of Student Learning

1. The program has clearly articulated learning outcomes for students.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

2. Student learning outcomes are "mapped" to the curriculum.

Sufficient Evidence	4
Some/Partial Evidence	1
No/Limited Evidence	0

3. The program provided a timeline indicating when faculty and staff assess SLOs. The timeline is manageable and sustainable.

Sufficient Evidence	0
Some/Partial Evidence	3
No/Limited Evidence	2

4. The program collected a variety of appropriate assessment data allowing judgements about the extent to which students are achieving learning outcomes.

Sufficient Evidence	3
Some/Partial Evidence	1
No/Limited Evidence	1

5. Program faculty consider assessment data in making changes to the curriculum, students' learning outcomes, and/or other aspects of the program.

Sufficient Evidence	3
Some/Partial Evidence	1
No/Limited Evidence	1

6. Student learning outcomes are aligned with the LEAP Essential Learning Outcomes in a way that is reasonable and meaningful.

Sufficient Evidence	4
Some/Partial Evidence	1
No/Limited Evidence	0

7. Overall, the program has an appropriate assessment plan for measuring students' progress in attaining the outcomes.

Sufficient Evidence	2
Some/Partial Evidence	2
No/Limited Evidence	1

General Comments related to Section V

As noted, the curriculum is very linear and the assessment tools are effective.

The assessment tools and type of data available was described. It is not clear if the program used the data regularly to reflect on student learning. Exit survey provided good information on program goals. I think it could also be used to determine students' perception of their learning- e.g., how do students feel about their progress toward SLOs?

The SOAS data presents students perceptions of knowledge and skills on ELOs, and does not reflect actual skills in those areas. The percentages are not "scores" and should not be interpreted as comparison values. I appreciate the amount of time it must have taken to complete the attached assessment document. The "assessment plan" was 80 pages long and included a lot of unnecessary information (e.g., course descriptions), which made the review difficult. I think the program would benefit from using the template provided by OAA, and clearly describe how students perform on the SLOs. It was not clear if the program had a timeline for assessment SLOs, or how/when/if data is used.

Most complete assessment plan I have seen in a self-study. The time required to assemble this is acknowledged!

2. As noted earlier, the curricular maps mark inclusion of SLOs for each class, but don't note Introduced, Developed, etc.

3. I had a hard time determining whether there was a regular, repeating timeline for assessment efforts; at the moment it feels like data is collected across the board and discussed as it is generated.

4. ACS tests, in course assessments, MFT, SOAS, Exit Surveys, class presentations, staff observations, safety records, lab reports were all listed as sources of assessment data. It feels pretty thorough and varied.

5. Assessment report included the exit interview questions, answers, interpretation, and action plans based on the responses; elsewhere in the report, there is detailed information on how classroom activities correlate to SLOs.

6. I'm a little surprised to not see the Personal and Social responsibility box checked -- I'd think that lab and industry safety would connect into that SLO,

7. Again; assessment activities certainly appear to be in full swing, and the measurement sources appropriate and useful -- I just had a difficult time finding a long-term plan.

VI. Student Recruitment, Enrollment, Retention, and Graduation:

A. Trend Data

1. [MAJORS ONLY] Five-year enrollment and graduation trends reflect program vitality and sustainability.

Sufficient Evidence	3
Some/Partial Evidence	2
No/Limited Evidence	0

2. [MAJORS ONLY] Credits-to-degree show that students can complete the degree in four years, or reasonably efficiently.

Sufficient Evidence	2
Some/Partial Evidence	3
No/Limited Evidence	0

3. [MAJORS ONLY] As a follow up to program enrollment and graduation, describe the strategies used to recruit and retain students.

Sufficient Evidence	1
Some/Partial Evidence	4
No/Limited Evidence	0

4. Composition of students approximates or exceeds the diversity of students at the University.

Sufficient Evidence	4
Some/Partial Evidence	1
No/Limited Evidence	0

5. Students can enroll in appropriate courses and proceed without delaying graduation.

Sufficient Evidence	3
Some/Partial Evidence	2
No/Limited Evidence	0

6. Claim that the program is oversubscribed, undersubscribed, or at optimum level is justified or supported by examples or data.

Sufficient Evidence	4
Some/Partial Evidence	1
No/Limited Evidence	0

General Comments related to Section VI.A

This is an area of concern. Will continuing enrollments sustain the program? Will the physical capacity accommodate increased enrollments? There is a clearly articulated need in the market.

Current enrollments in the program are deceptive, based on where they were a few years ago.

1. Enrollment has had a rather dramatic decrease, but is noted to reflect both statewide and national trends. It's also noted that lower enrollment levels have actually contributed to the vitality of the department in terms of available resources and staffing (they were understaffed at enrollment peak in 16-17). Graduation trends are noted to be at an all-time high

1. Significant decrease in enrollment, but the program still feels the enrollment is sustainable.

2. Noted that a substantial number of students' double major, increasing the average credits to degree.

3. I think the items listed are common, and expected, components of program management, and not necessarily linked to retention. Unless, the program is doing something unique in these common practices.

3. Two strategies for recruitment/retention are noted; maintaining their website and academic advising (as well as participation in undergraduate research). Are there any opportunities for more hands-on outreach to area high schools or state high school chemistry conferences?

4. Figures given show the department's student demographic closely matches the University's. Recruitment of under-represented populations appears to be largely through the encouragement of undergraduate research. Noted that the equity gap is pretty narrow in most years, and actually went positive in 21-22.

VI. Student Recruitment, Enrollment, Retention, and Graduation:

B. Demand for Graduates

1. [MAJORS ONLY] Placement information indicates that program graduates find employment or continue their education.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

2. Data suggests that employment opportunities for graduates of this program will remain strong.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

General Comments for VI.B

Employment prospects for graduates are encouraging.
1. Nice to hear there is such a demand (and local demand -- within 50 miles?!) for the graduates!
2. Stats: 9% growth in Wisconsin, 7% nationally. Nice.

VII. Resource Availability & Development:

A. Faculty and Staff Resources

1. Information on numbers of full and part-time faculty and staff are provided. Expertise of teaching staff are aligned with the needs and future vision for the program.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

2. Information is provided about changes in the faculty since the last Audit and Review.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

3. The program has identified staffing changes and anticipated areas of potential future need.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

General Comments related to section VII.A

There is a well-articulated need for a reconstitution of lost lines.

1. Program notes five areas of expertise required for continued program success: analytical, biochemistry, inorganic, organic, physical chem, and that currently all fields are represented with adequate numbers of instructors.

2. Loss of half a faculty line and a full academic staff position; however, with enrollment decline, this loss has had little impact on the program overall.

VII. Resource Availability & Development: B. Student Resources

1. The program has adequate personnel, student help, and service and supplies to serve its undergraduate students.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

2. The program has adequate facilities equipment, technological, and library resources to effectively serve its students.

Sufficient Evidence	3
Some/Partial Evidence	2
No/Limited Evidence	0

General Comments for VII.B

Student worker support seems adequate and well-funded. The challenge presented by technology needs is a concern.

The equipment in the program is costly. What strategies have been explored to help with these costs, for example- has there been any discussion with the foundation office about looking into donations? The need for larger classrooms seems a relevant issue, and if not addressed, may lead to fewer sections of courses available to students.

2. Noted that analytical balances the current most urgent technical need, though the polarimeters are 25 years old and will need to be replaced soon. Noted that the very, very expensive LC-MS would be useful for student training, but it does not appear that the current lack of an LC-MS has a negative impact. Classrooms to accommodate classes larger than 60 students appears to be an issue, especially if enrollments increase in the near future. Taking chemistry classes to other buildings is not viable, considering the need to transport chemicals and equipment across campus.

VIII. Conclusions and Recommendations from the Department or Program

1. Areas of strength are discussed.

Sufficient Evidence	5
Some/Partial Evidence	0
No/Limited Evidence	0

2. Areas of improvement and continued progress are discussed.

Sufficient Evidence	3
Some/Partial Evidence	2
No/Limited Evidence	0

3. Recommendations and resources are discussed.

Sufficient Evidence	2
Some/Partial Evidence	3
No/Limited Evidence	0

General Comments for VIII

Again, more specific strategies for addressing stipulated goals and a long-term plan would be helpful.

1. Dedicated faculty and staff, including the ADA and stockroom manager. Certification by ACS. State of the art instrumentation. Dedicated research labs for faculty. Commitment to undergraduate research.

2. Restoration to pre-COVID teaching delivery. Restoring level of grant funding to pre-COVID levels.

2.3.   The program recently submitted a 5-year accreditation report.   Are there areas of improvement that were identified during this review?

3. Request for university/college support in maintaining state of the art technology.

VI. Reviewer Conclusions

1. Strengths of the Program

Clear tie to core academics and general education. Attractive employment market.

Detailed, well-structured curriculum, easily guiding students through the various emphases. Dedicated faculty and staff, with adequate numbers to teach the five required fields. Dedicated research lab space for faculty. Current levels of technology matching the requirements of the profession. Exceptionally high post-graduate career placement numbers. Enrollment currently at levels that do not overstretch/over stress the program. Lots of good assessment data and evidence that actions are taken after reviewing data.

ACS accreditation, Opportunities for students, labs and equipment

- Student-centered faculty - Various opportunities for students to engage in HIPs - ACS accreditation - high graduation and placement rate

Department-wide coordination of efforts related to goals, initiatives, and service to students. Well-conceived curriculum with clearly articulated purposes for each emphasis/track in Chemistry.

2. Areas for Work or Improvement

Potential technology limitations and need for refurbishment and improvement. Will this be a concern with accreditations going forward?

I didn't find all that much to comment on, so the areas I note are pretty much the ones that the program notes for itself in the report. 1. Assessment plan: develop a multi-year approach so that all things are not assessed all the time (unless the ACS accreditation requires such an approach) 2. Continued maintenance and procurement of state of the art technology 3. Restoration of pre-COVID grant funding levels 4. Retrenchment and stabilization of teaching approaches in a post-COVID environment

The assessment plan should be rewritten to more clearly communicate the tools used to collect data, what is learned, and how information is used. Additionally, clarify how class/course data is being used in assessment efforts.

3. Other comments/questions

Clear and detailed report; thanks to the preparers

4. Recommended Actions (please specify):

1.   Use the template offered by the Office of Academic Assessment to clarify the overall multi-year assessment plan. Plan should clarify timeline, process, and implementation, and clarify student performance with regard to SLOs. Curricular map to include note of SLO introduction, development, and assessment. Program already collects and uses much data; what is requested for action is clarification of the plan, not the data.

2.   Program goals that advance the program should include clearer process outline and assessment data support. Clarify process of program goal creation and implementation, and how assessment collection and data is used throughout.

5. Recommended Result

Insufficient Information in the self-study to make a determination; revise self-study & resubmit.	0
Continuation without qualification. Next self-study will be a shortened one focusing on the Recommended Actions from the current report.	1
Continuation with minor concerns. Progress report may be required, at the discretion of the review team.	4
Continuation with major concerns in one or more of the four areas; submit annual progress report to the College Dean & Associate Vice Chancellor for Academic Affairs on progress addressing the major concerns	0
Withhold recommendation for continuation, place on probation, and require another complete Audit & Review self-study within 1-3 years, at the Committee's discretion.	0
Withhold recommendation for continuation, place on probation, recommend placing in receivership within the college, and require another complete Audit & Review self-study within 1-3 years at the Committee's discretion.	0
Non-continuation of the program.	0
Report not submitted; refer to Provost for action.	0