

Program Review Executive Summary

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Western Oregon University: Department of Chemistry (NSM Division)

Majors Reviewed:

- Chemistry: Traditional Emphasis
- Chemistry: Environmental Emphasis (to be discontinued)
- Chemistry: Forensic Emphasis
- Chemistry: Medicinal & Pharmaceutical Emphasis
- Chemistry: educator pathway

Minors and Certificates Reviewed:

- Chemistry
- Forensic Science
- Chemical Science
- Forensic Chemistry
- Medicinal Chemistry & Pharmacology
- Healthcare Science
- Environmental Chemistry (to be discontinued)

**Dates of Program Review: Academic Year 2020-21
External Reviewer Visit: May 2021**

Date of Executive Summary: June 2021

**EXECUTIVE SUMMARY:
DEPARTMENT OF CHEMISTRY (NATURAL SCIENCE & MATH DIVISION)**

The Department of Chemistry conducted a formal program review during the 2020-21 academic year, with external review taking place in the Spring term of 2021. The self-study was written by Dr. Patricia Flatt and was submitted to the Dean of the College of Liberal Arts & Sciences (LAS) in March 2021. Dr. Hala Schepmann, Professor of Chemistry at Southern Oregon University, conducted a virtual external review in May 2021 and submitted a report in June 2021. The LAS Dean consulted with Dr. Flatt in June 2021. The program review coincided with the Article 15 process that resulted in some administratively imposed revisions to WOU's Chemistry programs, and with the June 2021 retirement of Dr. Pete Poston. For these reasons, implementation of many findings is already underway, while some changes depend on whether and how soon Dr. Poston is replaced.

The departmental self-study and external reviewer's report emphasized the following programmatic strengths:

1. Offers important support to students in other science majors, such as Biology and Earth Science;
2. Serves 18% of NSM majors;
3. Offers strong programs in Forensic Chemistry and Medical Chemistry, along with traditional chemistry;
4. Offers chemistry-focused teaching pathway in collaboration with College of Education;
5. Has strong representation of female students (61%), aligned with university norms;
6. Serves high number of transfer students (29.3%);
7. Maintains a strong social media presence along with a robust internal alumni network;
8. Engages in extensive use of Open Educational Resources;
9. Uses industry experts to teach certain upper-division courses (such as Forensic Chemistry);
10. Has excellent NTT faculty to teach lower-division coursework;
11. Has developed clear and measurable programmatic learning outcomes aligned with University Undergraduate Chemistry Programs nationwide and LEAP, along with a robust and well-organized assessment plan;
12. Retains students at a rate consistent with university norms (71.8%);
13. Provides 1:1 faculty advising for each declared Chemistry major and minor;
14. Engages proactively with improving transfer pathways;
15. Maintains an excellent web site and appealing printed promotional materials;
16. Supports 350+ secondary students through Willamette Promise;
17. Strong female representation in a STEM field

The following challenges were identified:

1. Persistent low enrollments in Environmental Chemistry major and minor (these programs will be discontinued post-Article 15);
2. Lower than campus mean representation of under-represented minority students (19% in program, 26% at university level);

3. Article 15 mandates a 1.0 FTE reduction in instructional faculty, making it more challenging to offer courses frequently enough to ensure 4-year completion;
4. Potential over-reliance on NTT faculty may put department at odds with national best practices for forensic chemistry programs nationwide;
5. Forensic science capstone credits are lower than national norms.

Challenges were identified as:

1. Need to replace retiring faculty to remain viable;
2. Total number of faculty is insufficient if program wishes to receive ACS certification (which would be likely to generate additional enrollments, creating a “chicken-and-egg” dilemma);
3. Lack of FTE to offer sufficient inorganic chemistry and biochemistry courses, along with added lab hours, to achieve ACS certification;
4. Lack of adequate FTE to consistently teach inorganic chemistry;
5. No program budget for scheduled maintenance and upgrades of equipment;
6. Need for improved infrastructure and modern high-quality instrumentation.

Both prior to and as a result of the program review, in conjunction with Article 15 mandates, the Chemistry Department has decided to pursue the initiatives outlined in the Implementation Matrix below.

IMPLEMENTATION MATRIX

New Program-Driven Initiatives	Completed/ Ongoing	Underway (Target Completion Date)	To Be Done (Will be Ongoing)
Streamline curriculum to emphasize pathways with highest enrollments	X		
Redesign coursework to emphasize student success and future employability	X		
Create more efficient schedule of course offerings	X		
Develop and implement robust assessment plan	X		
Shift CH347 to 200-level course; offer as Gen Ed in health promotion area	X		
Increase efforts toward recruitment and retention of Chemistry majors	X		
Replace outdated and aging equipment, partially through enhanced grant-writing efforts		X (AY2022-23)	
Conduct annual programmatic reviews regarding enrollment and sustainability, as well as		X (AY2021-22)	

adaptation to student needs and teaching expertise			
Align program objectives with strategic plan		X (AY2021-22)	
Develop additional hands-on research and internship opportunities; ensure that students are well prepared for careers or postgraduate education	X		
Provide mentoring and faculty development opportunities to junior faculty		X (AY2021-22)	

Continuation of Ongoing Effectiveness	Completed/ Ongoing	Underway Target Completion Date)	To Be Done (Will be Ongoing)
Participating significantly in Willamette Promise dual credit initiative	X		
Contributing to General Education program	X		
Continuing with outstanding work in assessment of learning outcomes	X		
Continue with other successful high-impact practices such as 1:1 advising, internships, and alumni engagement	X		
Developing smooth transfer pathways and community college partnerships	X		
LAS Dean Recommendations	Completed/ Ongoing	Underway Target Completion Date)	To Be Done (Will be Ongoing)
Prepare cost-benefit analysis regarding potential advantages of ACS certification			X – Start in AY2021-22
Engage with successful Chemistry alumni as assets for improving recruitment and retention		X (Will be ongoing)	
Analyze recruitment and retention of minority students and consider what pedagogical adaptations might improve URM representation			X – Start in AY2021-22

I am pleased to note that, as noted in the above matrix, the Chemistry Department has already implemented many of the identified initiatives, with others well underway. The Chemistry Department, the NSM Division, and the LAS Dean also plan to advocate vigorously for appropriate replacement faculty. Ideally, the profile and visibility of Chemistry at WOU (along with enrollment and retention) would be likely to benefit from ACS certification if resources can be found to meet those requirements, particularly with regard to TT faculty and an ongoing budget for equipment maintenance and procurement. All these efforts provide an opportunity to positively position the future direction of the Department of Chemistry for long-term sustainability.