

# **Weber State University**

## **Executive Summary**

**Department of Chemistry  
College of Science**

**Date: Self study completed 11/21/2012**

## **Executive Summary for Chemistry**

The Department of Chemistry is housed within the College of Science. It is approved and certified by the American Chemical Society (ACS). Two options are offered that lead to the Bachelor of Science degree in Chemistry. Option 1 specifically meets all the requirements of the ACS and the graduates' names are submitted to the ACS and certified by the department. Option 2 provides a solid foundation in chemistry that is suitable for Pre-Medical, Pre-Dental, Pre-Pharmacy, and other Pre-Medical Professional students. The Chemistry Teaching Major leads to a Bachelor of Science Degree with secondary education licensure. The Chemistry minor, Chemistry Teaching Minor, and a Bachelor of Integrated Studies, BIS, emphasis in Chemistry are also available. The two-year Chemical Technician Program, leading to an Associate of Applied Science Degree or a Certificate of Skill Proficiency, is designed to emphasize skills required for employment as a technician in chemical laboratories. The chemistry faculty's range of expertise includes Analytical Chemistry, Biochemistry, Inorganic Chemistry, Organic Chemistry, and Physical Chemistry.

The mission of the Chemistry Department is to provide chemistry majors with the skills and knowledge of chemistry they need to successfully pursue their chosen professional careers and other activities following graduation from Weber State University. Included with this goal is the more global application to provide a solid theoretical and experimental chemistry foundation for other majors across campus, including but not limited to: Physics, Microbiology, Botany, Zoology, Geosciences, Criminalistics, Allied Health, Pre-Engineering, Pre-Profession students, and a general liberal education in chemistry for non-science majors (general education). The Department also provides services that require chemical expertise at the University and in our community. Faculty members are involved in community science and research projects which promote science education at all levels. Along with the faculty members, chemistry students render significant service each year at events such as the Utah State Science and Engineering Fair and Science Olympiad. The five main chemical expertise areas are: physical, analytical, organic, inorganic and biochemistry. The Department seeks to foster and promote learning and proficiency in each of these areas.

Our vision for the Weber State University Chemistry department is to be recognized as Utah's leader in undergraduate chemistry education by providing a highly versatile four-year American Chemistry Society certified program with outstanding faculty and specific strengths in analytical and medicinal chemistry, offering a strong two-year chemical technician degree, and fostering meaningful relationships with industry and government agencies.

While we focus on providing our majors with an outstanding education in chemistry, much of our effort and responsibility serves majors in other programs across campus. The Chemistry Department has averaged ten Chemistry Bachelor of Science majors per year over the last five years with a further eight Chemical Technology Associates of Applied Science majors per year. Our service courses are filled with 60-120 students per section with over 17,000 SCH's taught last year. Thus, the Chemistry Department provides a knowledge base for many other disciplines on campus as diverse as pre-engineering and nursing. Moreover, service provided by the Chemistry Department is often directed towards the community and rendered beyond the boundaries of WSU. Faculty members are actively involved in community science projects, which promote science education at all levels. Along with the faculty members, chemistry students render significant service each year at the Utah State Science and Engineering Fair held

at the Dee Events Center.

In order to better prepare our students for industry, graduate or pre-professional school, and education, faculty members within the Chemistry Department have identified and itemized a list of cognitive and technical skills desired of all graduating chemistry majors. These skills are defined as student learning outcomes. We have also identified the individual courses within the curriculum, which develop these skills or outcomes. The Chemistry Department has a formalized teaching assessment program and compiles data annually. The assessment of student learning outcomes impacts individual courses as well as the program overall. The American Chemical Society's Committee on Professional Training, ACS-CPT recently revised their Bachelor's Degree Program Guidelines to provide more flexibility to meet student needs and interests within a certified chemistry degree program. The chemistry department is particularly interested in developing degree options that focus on biochemistry and analytical chemistry and is developing the need foundations level courses to support these emphases. Our goal is to provide all of our graduates with ACS certified degrees.

The strength of the Chemistry Department lies in the dedication and expertise of both the faculty and staff. Presently, all tenured or tenure-track faculty members within the Chemistry Department have terminal degrees with unique talents and technical expertise. Chemistry has always placed priority in hiring and maintaining qualified and experienced faculty who complement the design, goals and mission of the program. The Department of Chemistry currently has eleven full time faculty. This represents a loss of one faculty line since the last five-year review. Despite the loss, the department has been able to maintain its course offerings but it has been necessary to cut the frequency of some of our course offerings. In particular, Our Quantitative Analysis course had been offered both spring and fall semesters for decades but is now offered only during fall semester due to faculty load constraints. This has created a bottle neck for students that are trying to progress efficiently through the chemistry degree program at a stage where many of them have just become chemistry majors. This causes potential chemistry majors to reconsider and sometimes choose other majors rather than put off graduation for a further year. Several chemistry faculty care significant overloads in online, hybrid, and face-to-face courses in order to meet departmental needs. This commitment, combined with the already significant teaching loads associated with large service course enrollments makes pursuit of meaningful research and support for undergraduate research very difficult. If the university truly values research opportunities for students, it must provide better support by creating meaningful release time options for faculty that are actively involved in undergraduate research.

Like Weber State University itself, the Chemistry program is open to all WSU students. There is no application requirement, nor mechanism set up to exclude anyone from chemistry. The number of declared Chemistry majors varies from year to year. Their demographics have remained relatively constant over the recent years with about one third female and two thirds male. The total number of students taking chemistry each year has grown substantially over the past five years from 465.67 to 578.47, an increase of about 24%. This has occurred at the same time the department has lost a full-time faculty line. While not reflected in the statistics covering this report period, we currently have a record number of students in our upper-division courses and anticipate twenty to twenty five graduates each year for the next several years. It is too early to predict if this is the beginning of a long-term trend or an unusual cyclical variation. Nevertheless, we do expect to be able to attract more majors to chemistry if we can successfully implement the planned changes related to the new ACS-CPT guidelines noted above.

Operating costs also continue to increase. Prices of chemical and other consumables related to providing laboratory courses have continued to rise along with fuel prices. Increases are observed for instruments, equipment, glassware and chemicals including: purchase, shipping, storage and disposal. Lab fees are now used extensively to cover the costs of provide students with laboratory experiences required by the ACS-CPT guidelines. Without these fees we would not be able to continue running the majority of our laboratory programs. Since legislative appropriations per student continue to drop it is likely that course and lab fees will need to increase simply to maintain our current programming level, thus further shifting costs of an education to students.