

University System of Georgia Comprehensive Program Review Web-Based Report

A. All Program Reviews

Institution Name: Columbus State University

Date: 06/18/02

Degree/Major Name: BS in Chemistry

Degree Acronym: BS

CIP Code: 40050100

Degree Level: Bachelors

College/School/Division: College of Science

Department: Department of Chemistry and Geology

Were other closely related programs reviewed as part of this program review? Yes

Provide the names of these programs so that we may connect these reviews.

BA in Chemistry

Were external reviewers used to evaluate the results of the program's self-study? Yes

If yes, please describe their role.

The role of the review team was to provide an analysis of the self-study and the program. The process included an assessment of the viability, productivity, and quality of input and evaluative elements ranging from program mission to service. At the conclusion of their visit, the review team identified strengths of the program, provided suggestions for improvement, and presented their recommendations.

Year of the Next Scheduled Program Review: 2008

Accreditations Obtained:

Year of initial accreditation or last program re-accreditation review:

Faculty Resources:

The faculty members are well prepared for the offering of the bachelor's degree in chemistry. Four faculty have PhDs, have research experience and represent the four basic disciplines of chemistry. Another faculty member does not have an advanced chemistry degree, but is an extremely valuable member of the department, carrying a very heavy laboratory management load. Certainly the department needs to have such a person continue as a member of the department. Each member is active in service and each seems to teach a rather heavy load. A high percentage of the credit hours generated are dedicated to Area D of the core curriculum, including service courses for students in the BSN in Nursing. No courses are taught by part-time faculty.

For more information on this program review, contact:

Name: Carl Wallman

Title: Assistant VPAA

Phone: 706/569-3121

Email: wallman_carl@colstate.edu

B. Scheduled Reviews of Programs

The BS and BA in Chemistry programs were triggered rather than scheduled.

C. Triggered Reviews of Programs

Why was the program reviewed early?

Low Enrollment

No, enrollment was above the minimum guidelines.

Few Graduates

The number of graduates in the BS and the BA in Chemistry was 9 in FY 1999, 7 in FY 2000, and 9 in FY 2001 for an average of 8.33 for the three-year period. This number is below the minimum System guideline of 10 for bachelor's programs.

Major Findings and Recommendations

Quality

The chemistry faculty are in agreement regarding pedagogy, content of materials, techniques of delivery, and assessment instruments being followed in the department. In

particular, the content for introductory courses is designed by the whole faculty rather than by individuals. The chemistry faculty have developed classroom visitations for each other, which has a great impact on faculty improvement of their lectures, techniques, and methodology of instruction. The chemistry faculty have agreed to faculty peer evaluation instruments where the teaching component ranks as 60 percent of their all over evaluation. Classroom visitation is part of this evaluation instrument. Faculty are encouraged to submit faculty evaluation forms from selected classes to demonstrate teaching excellence. Class sizes are adequate with an average enrollment of 37 in lower division courses and 18 in upper division courses.

The faculty recognize the value of teaching through research. Research programs are utilized to attract students beginning in the sophomore year. These efforts are intensified during the senior year. As a requirement for a degree in chemistry, each senior must spend one academic year as a resident in chemical research with one of the faculty. This research program is credited through an academic course titled "Senior Seminar." Students are required to submit a senior thesis and make a presentation to the department faculty and students at the end of the academic year. All faculty share in the evaluation of senior presentations.

The Department of Chemistry and Geology is committed to internship and co-op services to better train their graduates. The university has created an office for placing, managing, and supervising these students while at work. Students have been placed with companies ranging from Callaway Chemicals and Pratt & Whitney to the Georgia Bureau of Investigation.

The baccalaureate degree programs in chemistry are designed to offer students a solid background in inorganic, analytical, organic, and physical chemistry, as well as exposure to applied chemistry, biochemistry, spectroscopy, and chemical analysis. Graduates are expected to understand quantitative interpretation, to think independently, and to apply skills and knowledge of chemistry to real-world problems. Because of the diverse goals of chemistry students, the Bachelor of Arts in Chemistry and Bachelor of Science in Chemistry are offered. The department administers a standardized examination that is produced by Educational Testing Services (ETS). This exit examination is used as an in-house device to measure and track departmental progress. Faculty members meet annually to review the results and to modify the program and/or teaching pedagogy to improve student learning.

Along with maintaining active research programs, the faculty pursue professional development through three primary activities: mentoring, collaboration, and workshops. When new faculty members enter the department, senior faculty members are assigned to help wherever possible. They visit lectures to give feedback on classroom teaching, they help in writing proposals and locating funding sources, and they provide other input as needed. The faculty also collaborate with other institutions in order to broaden their experience. The university does not provide support for sabbatical leave; therefore, alternative venues for developing relationships have been sought. These include support for summer research (i.e., National Research Council, Air Force Office of Scientific

Research) and collaboration with other researchers to fill this void. Finally, all of the faculty attend workshops whenever possible to keep abreast of new developments in teaching, instrumentation, and technology.

Productivity

The academic background of the students is above average for these degree programs. Although the average number of graduates is below the minimum guideline, the average number of majors (40) is well above the minimum of 10. The projected increase in the overall enrollment at Columbus State University will more than likely result in an increase in the number of chemistry majors and graduates. With an average of almost 1,300 credit hours generated each fall semester, the department is providing a significant service to other programs as well. The quality seems quite good, but there is a need for more students graduating with a degree in chemistry. With a national trend toward fewer chemistry majors, CSU will direct attention towards recruiting and retaining more majors.

The science building is appropriate in size and design. The laboratories are well suited for an undergraduate chemistry program. There are sufficient hoods and other safety measures present. The laboratories were very well kept and well organized for undergraduate teaching laboratories. The stockrooms are very well organized for efficient operation. Except for NMR facilities, the department is well equipped with the basic instrumentation, although some are rather aged for an undergraduate program.

The research and scholarship seem adequate for an undergraduate program. However, the teaching load is extremely heavy to allow for much scholarship. The faculty members do utilize undergraduate majors to assist in research projects. Perhaps the faculty members could draw upon some of the environmental science graduate students for research collaboration.

Viability

A. Continue and strengthen the program

The faculty members are well qualified for the program. The students have the advantage of small class sizes that allow for considerable interaction between the students and faculty members. The requirement for the senior seminar, which involves research with faculty members, is a very strong point of the program. The faculty members are extremely dedicated to teaching and spend a lot of quality time with students, both in the laboratories and during office hours. The number of non-productive grades is very small, particularly in lower division courses; the faculty should be commended for their efforts in achieving this result.

The number of faculty members is barely adequate for the number of majors, but the number of majors is not sufficient to ensure a viable program based on the number of graduates per year. It is recommended that the department hire an environmental chemist

with expertise in analytical chemistry. This is a very popular field for many students and should attract more majors. One of the faculty members should be assigned to advise and recruit premedical students. Also, the department should take advantage of Auburn University's offer to host a visit from CSU students to their NMR facilities. NMR is the major piece of equipment missing from the CSU offering.

The department should be allowed to continue offering both the BA and the BS in Chemistry. The faculty members support many other degree programs; therefore, the cost of offering these programs is very small. The program, although small, produces highly qualified graduates. There certainly is a need for such well-trained chemists. The department does need to work on recruitment and retention of majors.