



**SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS**

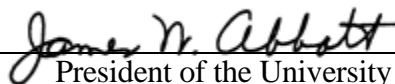
**Institutional Program Review
Report to the Board of Regents**

Use this form to submit a program review report to the system Chief Academic Officer. Complete this form for all units/programs undergoing an accreditation review, nationally recognized review process, or institutional program review. The report is due 30 days following receipt of the external and internal review reports.

UNIVERSITY:	USD
DEPARTMENT OR SCHOOL:	Department of Chemistry
PROGRAM REVIEWED:	BS, MS and PhD
DATE OF REVIEW:	2/27/2018
TYPE OF REVIEW:	Institutional Program Review

University Approval

To the Board of Regents and the Executive Director: I certify that I have read this report, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.



President of the University

5/9/2018
Date

1. Identify the program reviewers and any external accrediting body:

Chemistry Departments within the United State do not have an accrediting agency. The Departments can provide an ACS approved degree having met standards for: 1) chemistry curriculum offered, 2) qualified faculty to teach these courses, and 3) sufficient laboratory space, equipment and instruments available for student use. ACS approval is conducted every six years.

External Program Reviewers included:

Professor (Full) Leonard MacGillivray, Department of Chemistry, University of Iowa, Expert in Materials Chemistry.

Professor (Full) David Pierce, Department of Chemistry, University of North Dakota, Former Chair of a similar sized Chemistry PhD program at UND.

2. Items A & B should address the following issues: mission centrality, program quality, cost, program productivity, plans for the future, and assessment of progress.

2(A). Describe the strengths and weaknesses identified by the reviewers

Strengths

- Impressed by spirit, engagement and collegiality displayed by Department members
- They noted a small improvement in undergraduate majors from faculty efforts already
- Recent PhD degrees awarded already match favorably with traditionally larger and more established departments in the Midwest.
- A Materials Chemistry focus is fitting as it involves all types of chemists.
- Quality of recent hires is high.
- Faculty have been successful in garnering external support (IGERT, NRT, MRI, REU, CAREER), leading to increased State and Federal visibility.
- Faculty have been proactive in capitalizing on research, with numerous disclosures, patents and licenses. Materials is a favorable area for IP.
- The Department has enjoyed good support from alumni in the past.

Weaknesses were not specifically identified in their letter, rather they directed their comments toward Opportunities and Challenges which are addressed in the following section.

2(B). Briefly summarize the review recommendations

External evaluators provided Opportunities and Challenges related to the Chemistry Department's four major goals:

Undergraduate Chemistry Majors

We strongly suggest that the faculty have an opportunity to interact with first-year students early in the admissions process so that the students will have an early means to decide to become chemistry majors.

Graduate Program Graduation Rates

The faculty should also continue the strong efforts to garner forms of Departmental support for graduate students (e.g., training programs). Efforts should also be directed to address improvement of the health plan of domestic graduate students.

Grants and Contracts

Continued success will rely on academic and administrative leadership by the faculty, particularly given upcoming retirements. USD should consider additional means to provide support to the faculty that will be present following retirements. The faculty should develop a hiring plan, with a goal to hire new faculty with interests and aims that overlap with biology and medicine.

Alumni Support

The faculty should continue efforts to raise scholarships and annual giving, but also work closely with the Dean to establish and pursue larger development goals. We believe that faculty and student recognition (e.g., named professorships, graduate student awards) would provide much strategic value at this point of Departmental growth and that renovating space in Churchill-Haines should also be a priority.

2(C). Indicate the present and continuous actions to be taken by the college or department to address the issues raised by the review. What outcomes are anticipated as a result of these actions?

Undergraduate Chemistry Majors

- i) To aid in outreach and recruiting new majors to chemistry, eight area high school chemistry classes visited USD Chemistry in 2017-2018 (25 were invited). Gold nanoparticles are synthesized and characterized by advanced instrumentation; students toured different research labs that included demonstrations; and participants were provided with a free lunch at the Student Union and an optional tour of campus.
- ii) The first undergraduate chemistry recruiting brochure has been designed and printed.
- iii) Letters and emails have been sent to all prospective students who indicated an interest in chemistry as provided by the A&S Blue Ribbon Recruitment Panel.
- iv) To incentivize students to major in Chemistry, the department is offering merit scholarships if students have done well in introductory chemistry coursework.
- v) Investigate the possibility of instituting a new Medical Chemistry major that would appeal to medicine, dentistry, biochemistry, pharmacy, and biomedical engineering students.

Graduate Program Graduation Rates

- vi) Increasing graduate enrollment is linked to increasing external funding. Over the next four years, the number of graduate students involved in MS and PhD programs will increase due primarily to three external grants: The Center for Fluorinated Functional Materials (CFFM); the NSF NRT; and Chemistry ongoing participation in the statewide EPSCoR T1 program.
- vii) Chemistry is actively sending faculty to national and regional ACS and MRS meetings to recruit new graduate students at official recruiting events sponsored by these professional meetings.

- viii) A new graduate chemistry recruiting brochure has been redesigned and copies printed.
- ix) Chemistry added one (2013) and then two (2016) Environmental Health & Safety assistantships (12 month, MS equivalent lines), to assist the EHS Director in the handling and disposal of chemical, radiation and biological waste across the University.
- x) The Department will investigate the establishment of a 3+2 BS/MS program linked to regional PUI and international universities, to see if there is interest in a combined undergraduate/MS degree program.

Grants and Contracts

- xi) Four major state and federal grants, that take effect in 2017 and 2018, will take Chemistry through the next four years in excellent shape: SDBOR *Center for Fluorinated Functional Materials* (CFFM) \$2,700,000; NSF *REU Site: Undergraduate Research in Fluorine Chemistry*, Award Amount: \$208,000; NSF *NRT: University of South Dakota Neuroscience and Nanotechnology Network*, Award Amount: \$2,943,562; NSF *MRI: Acquisition of the Lawrence Supercomputer to Advance Multidisciplinary Research in South Dakota*; Award Amount: \$504,911
- xii) The combination of the Center for Fluorinated Functional Materials, the graduate NRT award, the undergraduate REU award, a new supercomputer cluster, and the hiring of two new computational chemists aligns Chemistry well to join the current Biofilms EPSCoR RII-T1 program (2018).
- xiii) Two Individual Investigator grants have been awarded by NSF (Rick Wang) and NIJ (Stan May) to chemistry faculty in 2017. The department will continue to submit individual investigator proposals to external funding agencies in addition to attempting to attract larger center-type grants such as EPSCoR.

Alumni Support

- xiv) Former alumni will be invited back to give departmental seminars to retain contact and potential scientific collaborations.
- xv) Continue sending an annual department newsletter to all former chemistry majors (~900 alumni).
- xvi) The Chair will help the Foundation and the dean of A&S attract larger donations
- xvii) Pursue internal and external avenues to refurbish chemistry laboratories in Churchill-Haines
- xviii) Alumni support should focus on graduate, faculty and infrastructure needs more than undergraduate scholarships in the future.