SOUTH DAKOTA BOARD OF REGENTS

Committee on Academic and Student Affairs

AGENDA ITEM: III – C (1)

DATE: December 12-13, 2012

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SUBJECT: Request to Seek Accreditation – BHSU

Black Hills State University has submitted a request to seek approval to award American Chemical Society (ACS) certified degrees in Chemistry.

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RECOMMENDED ACTION OF THE EXECUTIVE DIRECTOR

Approve BHSU’s request to seek approval to award ACS certified degrees in Chemistry.
SOUTH DAKOTA BOARD OF REGENTS

Request to Seek Accreditation Under BOR Policy

1. Institution: Black Hills State University

2. Program(s) seeking accreditation: Chemistry

3. Level of program(s) involved in accreditation:
   - [ ] Certificate
   - [ ] Associate Degree
   - [x] Bachelor’s Degree
   - [ ] Master’s Degree
   - [ ] Doctoral Degree

4. Accrediting Agency: American Chemical Society

5. What are the advantages of accreditation?

The American Chemical Society (ACS) approves high quality chemistry programs and allows them to grant ACS-certified degrees. Gaining approval from the ACS to grant certified chemistry degrees will provide an external stamp of approval for the chemistry program at Black Hills State University. The process for gaining approval to grant certified degrees is analogous to accreditation offered by other education and professional organizations: the chemistry program at BHSU will undergo an external review process by the Committee on Professional Training (CPT) and, once approved, will be listed in a searchable database of ACS-approved programs.¹

Black Hills State University’s chemistry program is part of an integrated science department where the faculty collaborate with scientists from other science disciplines on a variety of research and teaching projects. In addition to serving chemistry majors, the program provides crucial support for students in other science fields including biology, environmental physical science, pre-health professional, pre-nursing, and science education. We will retain the strengths of a well-integrated science department, while also developing the program’s identity as a unique chemistry program that can contribute to state-wide STEM initiatives. One unique thrust is on creating a more sustainable environment with a focus on sustainable aquaculture and the discovery of natural products from common South Dakota vegetation for medicinal applications. Partnerships with chemists and engineers at other state institutions are growing through the Photo-Active Nanoscale Systems (PANS) program. BHSU faculty are also engaged in collaborative research with the South Dakota Biomedical Research Infrastructure Network (SD BRIN) and the Sanford Underground Research Facility (SURF). Chemistry faculty members also have collaborative research efforts with scientists in other states.

Several key advantages of certification are detailed below.

¹ https://portal.acs.org/portal/acs/corg/coldfusionapp/?_nfpb=true&_pageLabel=mapp_cptasl_page#
i. Certification will improve the chemistry education at BHSU. Students who earn a degree certified by the ACS receive a broad education in all five of the foundational areas of chemistry: analytical, organic, inorganic, physical, and biochemistry. In addition, the program must include advanced courses to develop an in-depth understanding of chemistry. The breadth and depth of an ACS-approved program will provide an education that develops critical thinking, scientific writing, and verbal communication skills, as well as significant hands-on laboratory experience that will enhance students’ technical proficiency and understanding of the scientific method.

ii. Students graduating with an ACS certified degree will be recognized for completing a rigorous, comprehensive chemical education. This national recognition will provide our students with an advantage when applying for chemistry or other science positions, graduate programs, or professional programs. The prestige associated with an ACS-certified degree is recognized by employers and graduate admission committees; as a result, BHSU graduates will have a competitive edge.

iii. Gaining ACS approval will allow the chemistry program to become more competitive in attracting the most talented students. Having a certified program will be attractive to highly qualified students, especially those interested in studying at a small liberal arts institution. Additionally, approval will enhance our ability to recruit international students, as ACS-certified degrees are recognized worldwide.

iv. Meeting ACS certification requirements has increased the range of expertise of the BHSU chemistry faculty. In order to advance the chemistry program at BHSU to meet ACS certification standards, two new faculty members have been added to the department. With these additions, the chemistry faculty at BHSU has a broad range of expertise covering all of the foundational areas of chemistry. In the future, the prestige of offering an ACS-certified degree program will help BHSU to recruit and retain the most highly-qualified faculty.

v. Meeting ACS certification standards has greatly improved the chemistry program. With the addition of the chemistry faculty mentioned above, BHSU now has the expertise and capacity to expand its chemistry curriculum. To meet the standards of an ACS-certified degree, BHSU offers inorganic chemistry lecture and laboratory, and will offer physical chemistry laboratories.

vi. ACS certification increases the quality of the chemistry education given to students with other majors. Chemistry is a significant component of all other scientific disciplines taught at BHSU, including Biology, Physical Science, and Environmental Physical Science, and provides essential scientific education for pre-health-professional students. A stronger, more comprehensive chemistry program significantly improves the background that is built for students in these other fields and strengthens education in all areas of science, not just chemistry.

vii. Having an ACS-certified program increases South Dakota’s economic competitiveness. Numerous initiatives in South Dakota, such as the National Science Foundation-funded Experimental Program to Stimulate Competitive Research (EPSCoR) Photo-Activated Nanoscale Systems (PANS) research initiative, the National Institutes of Health-funded South Dakota Biomedical Research Infrastructure Network (SD BRIN), and the Sanford Underground
Research Facility (SURF), are aimed at improving the ability of the state to compete for federally funded research grants and, ultimately, to attract high tech companies to locate in South Dakota. Having a certified program at BHSU helps these initiatives in two ways. First it increases the caliber of student that BHSU can send forward into the PANS and BRIN programs to make these programs stronger, and second, it assures incoming companies that there is an available workforce with excellent chemical training.

6. What are the anticipated costs involved in accreditation, including:

A) Costs involved in undergoing self-study and preparing the application for accreditation.

The initial preparation of the pre-application form is straightforward and may be completed by a chemistry faculty member in a short time frame, so there will be no cost involved. The preparation of the complete self-study and application package is more involved and will require 1-2 semester hours of release time for a chemistry faculty member. The application package will be reviewed by the CPT, and then members of the chemistry faculty will meet with the CPT in person at a national meeting of the ACS to discuss the chemistry program and specific issues with the application package. At least two faculty members must attend this meeting at an estimated total cost of $2,000-2,500.

B) Out-of-pocket costs related to dues or site visits.

The ACS pays all expenses involved in a 1-2 day site visit by a member of the CPT, which follows the conference at the ACS national meeting. Further, the ACS does not charge an annual fee to maintain certification.

C) Base budget implications including incremental costs and minimum base resources required (dollars and FTE).

Faculty: To obtain ACS approval to grant certified degrees, a chemistry program must have at least four full time permanent faculty members wholly committed to the chemistry program. To meet this requirement, two additional tenure-track faculty members have been hired so the chemistry program already meets this requirement. As needed, faculty members from outside the chemistry department may teach courses in chemistry; for example, physics faculty members occasionally teach physical chemistry. Funding for the new positions was initially supported through an NSF-EPSCoR grant and the university is fully committed to supporting these positions on a permanent basis.

Inorganic Chemistry Requirement: A second requirement to obtain certification is the inclusion of an inorganic chemistry lecture and laboratory, and two additional physical chemistry laboratories in the chemistry curriculum. Instructors for these classes are provided by the two additional full time employees outlined above. The inorganic chemistry lab does not require any specialized equipment beyond what is currently available, but will require the purchase of additional chemicals to support these labs (~$1000/year for the first three years). It is anticipated that the physical chemistry labs will require the purchase of some additional equipment and software (~$5,000/year for the first three years).
Core and Advanced Courses: Additionally, the ACS requires certified chemistry degree programs to offer both core and advanced courses in all of the five fundamental areas of chemistry on a regular basis. To reach this requirement, some of the upper level courses that are currently offered every other year will now be offered annually. The increased course offerings will be distributed among the existing fulltime faculty.

7. What is the source of the resources needed?

The cost involved in section 6A, self study and preparation of application, will be borne by the School of Natural Sciences and the College of Business and Natural Sciences at BHSU.

The bulk of the costs identified in section 6C is being supported initially by the NSF-EPSCoR grant. Under this grant BHSU has an average budget of approximately $162,500 for each of five years since 2009. BHSU’s primary mission under this grant is to hire faculty necessary to obtain ACS certification. By strategically hiring faculty who can interact with the PANS research group and establish photo-activated nanoscale research programs at BHSU, we continue to increase the state’s infrastructure and research competence in this vital emerging area of chemistry.

The first year’s budget under this grant was spent to obtain a super-conducting 300 MHz NMR spectrometer, a key piece of research and teaching instrumentation required for ACS approval. The budget for the remaining four years is being spent for partial salary support for the two new chemistry faculty members, for start-up packages to purchase supplies and instrumentation necessary to establish their research programs, and to purchase any chemicals or equipment needed to establish the new teaching laboratories outlined above. BHSU has made a commitment to support the program and the two recently added positions on a permanent basis through internal reallocations.

8. What is the estimated date for submission of accreditation application?

The pre-application will be submitted in the fall of 2012.

[Signature]
Institutional Authorization (President)