

**SOUTH DAKOTA BOARD OF REGENTS**

**Academic and Student Affairs**

**AGENDA ITEM: 6 – F**  
**DATE: October 4-5, 2023**

\*\*\*\*\*

**SUBJECT**

**New Program Request – SDSMT – PhD in Chemical and Biological Sciences**

**CONTROLLING STATUTE, RULE, OR POLICY**

[BOR Policy 2:23](#) – New Programs, Program Modifications, Curricular Requests, and Inactivation/Termination

**BACKGROUND / DISCUSSION**

South Dakota School of Mines & Technology (SDSMT) requests authorization to offer a PhD in Chemical and Biological Sciences. The PhD in Chemical and Biological Sciences will provide advanced studies and research training spanning applied aspects of chemistry and biology, including green chemistry, sustainable energy, environmental science, biotechnology, and biomedical health sciences. The program will prepare students for various career options in these high-demand technology areas, will better prepare scientists and professionals for the increasingly multi-disciplinary nature of applied science.

The Executive Director approved the Intent to Plan, which the Board was notified of at the [March 2023](#) meeting. Per BOR Policy 2:1, an external review of the program was conducted and the final report of the reviewers was received by the Board office. The report, along with SDSMT’s response to the report, are included in Attachments II & III.

**IMPACT AND RECOMMENDATION**

SDSMT plans to offer the PhD in Chemical and Biological sciences on campus. SDSMT does not request new state resources. Six new courses will be required. SDSMT estimates 16 students enrolled and 4 graduates by the sixth year of the program.

Board office staff recommends approval.

**ATTACHMENTS**

- Attachment I – New Program Request Summary: SDSMT – PhD in Chemical and Biological Sciences
- Attachment II – External Review Report
- Attachment III – SDSMT External Review Response

\*\*\*\*\*

**DRAFT MOTION\_20231004\_6-F:**

I move to authorize SDSMT to offer a PhD in Chemical and Biological Sciences, as presented.

**Full Proposal – Ph.D. Chemical and Biological Sciences  
South Dakota School of Mines and Technology**

**BOR Recommendation:** The Board of Regents Academic Affairs and the Executive Director support the program request. This program will increase the number of conferred advanced STEM degrees in South Dakota while supporting existing industrial sectors.

**Program Description:**

This program will provide advanced studies and research training spanning applied aspects of chemistry and biology, including green chemistry, sustainable energy, environmental science, biotechnology, and biomedical health sciences. The program will prepare students for various career options in these high-demand technology areas. Moreover, the cross-disciplinary program curriculum will better prepare scientists and professionals for the increasingly multi-disciplinary nature of applied science.

**Strategic Impact –**

**SDSMT Strategic Impact:** BOR Policy 1:10:3 provides the mission of South Dakota School of Mines and Technology as “that of a technological university specializing in undergraduate and graduate education emphasizing science and engineering” and SDCL 13-60-1 states the school “shall provide undergraduate and graduate programs of instruction in engineering and the natural sciences and other courses or programs as the Board of Regents may determine.” The proposed program will support all components of the SD Mines statutory and governing body mission statements by providing advanced research and study in critical fields. Further, this proposed Ph.D. program aligns well with the operational mission of South Dakota Mines – to educate scientists and engineers to address global challenges, innovate to reach our creative potential, and engage in partnerships to transform society - by preparing leaders with advanced study across multiple science, technology, and engineering disciplines. This program will advance knowledge and its application through the support of faculty-led and externally supported research and will serve the region, the state, and the nation by providing well-trained graduates to drive economic development in science and technology.

**BOR Strategic Impact:** The proposed program will support the Board of Regents Strategic Plan 2022-2027 in the following ways:

- *Student Success* by increasing the number of graduate degrees awarded and by attracting/retaining more non-resident students in South Dakota.
- *Academic Quality and Performance* by creating a new Ph.D. program for the state.
- *SD State Workforce Development* by preparing workers to support the existing industrial sectors and initiating the development of new technologies in South Dakota.
- *Research and Economic Development* by increasing grant and contract expenditures and the number of graduates from STEM programs.

**Program Summary:**

The classification of this program will be 30.0101 [Biological and Physical Sciences]. This program is proposed to be an on-campus program not delivered through distance education. The university anticipates students entering this program will be recruited from Mines students who have completed a bachelor’s degree in chemistry or biology. Currently, about 50% of graduates from those two programs go on to pursue graduate degrees, and of those pursuing graduate degrees,

about 50% do so outside South Dakota. The proposed Ph.D. program will provide opportunities for SD students to complete their graduate education in chemistry and biology at Mines while contributing to the needed high-tech workforce in South Dakota.

### Duplication and Competition:

There are no identical Ph.D. programs within the regental system.

SDSU offers doctoral programs in Biological Sciences, Biochemistry, and Chemistry and USD offers doctoral programs in Biological Sciences, and Materials Chemistry. Additionally, SDSU offers a PhD in pharmaceutical sciences and USD offers a PhD in Basic Biomedical Sciences. While those programs may initially appear similar in name, the fundamental and important difference between those programs and this one, is that this program will have emphasis on the technology and applied aspects of the chemistry and biology fields for the specific areas of energy, environment, and health. Applied chemistry/biology is the application of concepts and methods of chemistry/biology to solve real-world problems. The Ph.D. of Chemical and Biological Sciences at South Dakota Mines will be a science-based discipline founded upon the chemical and biological sciences emphasizing research in energy, environmental, and biotechnology. The curriculum of the Chemistry and Biological Sciences Ph.D. program will be different from any existing programs that are solely a Chemistry Ph.D. or solely a Biology Ph.D. in the South Dakota Regental system.

With the unique aspects of the Chemical and Biological Sciences Ph.D. program, Mines academic leadership and the program faculty have indicated that they are open to collaboration with the graduate programs in the SDBOR institutions to enrich the graduate curriculum and enhance the research competitiveness of South Dakota.

To understand the statistics in South Dakota, the Integrated Postsecondary Education Data System (IPEDS) for 2021-2022 reporting shows that the state produced a total of 23 doctorates in related fields.

### Regental Universities<sup>1</sup>:

University	Conferred Ph.D. Degrees Biological/Biomedical Sciences or	Total Number of Doctoral Conferrals (All University)
SDSU Biological/Biomedical Sciences, Ph.D.	12	157
SDSU Chemistry, Ph.D.	5	--
USD Biological/Biomedical Sciences, Ph.D.	4	256
USD Chemistry, Ph.D.	2	--

### Private SD Universities<sup>2</sup>:

University	Conferred Degrees	Total Number of Doctoral Conferrals (All University)
None	0	0

<sup>1</sup> Integrated Postsecondary Education Data System (IPEDS) for 2021-2022

<sup>2</sup> Integrated Postsecondary Education Data System (IPEDS) for 2021-2022

**Total Sum of SD Peer Findings:**

University	Conferred Ph.D. Degrees Biological/Biomedical Sciences and Chemistry	Total Number of Doctoral Conferrals (All University)
Total	23	413

The number of conferred Ph.D. degrees in related fields, specifically Biological/Biomedical Sciences and Chemistry, as reported by IPEDs was 23 out of a total of 413 for all of South Dakota. This is less than 5% of the total number of doctorates awarded. The opportunities for students with advanced degrees in these fields exceed the current number of degrees awarded.

**Workforce Outlook/State Need:**

There is state-level, national, and international demand for skilled personnel in industry to support technological innovations in green chemistry, sustainable energy, environmental science, biotechnology, and biomedical health sciences, which are the focus areas of the proposed Ph.D. program in Chemical and Biological Sciences. The proposed degree will train students in the chemical and biological technologies associated with these high-demand technology sectors.

The proposed Chemical and Biological Sciences Ph.D. program aligns with several industries targeted by *The 2020 Vision: The South Dakota Science and Innovation Strategy*, including energy and environment, advanced manufacturing and materials, and human health and nutrition. The students in the program will be prepared to translate scientific discoveries into technological innovations within these target industries. The Ph.Ds. who graduate from the program will be able to directly contribute to the research, development, and manufacturing enterprises of these targeted industries in South Dakota. The South Dakota Department of Labor & Regulation, for the period from 2018 to 2028, projects significant employment growth for the careers related to applied chemical and biological sciences, as shown below:

SOC Code:	SOC Title:	2018 Base Number:	2028 Projected Number:	Percentage Change
11-9121	Natural Sciences Managers	83	87	4.8%
19-1000	Life Scientists	1,918	2,119	10.5%
19-1029	Biological Scientists, Other	98	102	4.1%
19-1042	Medical Scientists (No Epid)	157	180	14.7%
19-2000	Physical Scientists	592	647	9.3%
19-2031	Chemists	142	159	12.0%
19-2041	Enviro Scientists/Spclst	240	262	9.2%

The Ph.D. program in Chemical and Biological Sciences supports the growing research activities in the area of chemical and biological sciences from the CBHS faculty at South Dakota Mines and contributes to the strategic sectors of energy and environment, materials and advanced manufacturing, and Human Health and Nutrition in the South Dakota 2020 vision.

**Competitor University Peers<sup>3</sup>:**

University	Conferred Ph.D. Degrees	Total Number of Doctoral Conferrals (All University)
Colorado School of Mines, Applied Chemistry, Ph.D.	4	88
U of Massachusetts at Lowell, Chemistry, Ph.D.	6	98
U of Maryland-Baltimore, Biological Sciences, Ph.D.	5	89

According to the US Bureau of Labor Statistics, the average national salary/wage for chemists is \$89,130 and the SD average is \$60,210-76,740. For biological scientists, the average national salary/wage is \$90,010 (no SD data were available). This program provides students with Ph.D.-level education and research training needed to utilize the practical application of chemistry and biology to solve problems being faced in today's complex world.

The Ph.D. in Chemical and Biological Sciences will bolster the capacity for science and technology innovations in South Dakota by imparting students with the knowledge needed to tackle real-world challenges and positively contribute to a knowledge-based economy. This increased science and technology knowledge and expertise will have a direct positive contribution to the state's economic development.

Specifically, this Ph.D. in Chemical and Biological Sciences aims to impart students with the knowledge needed to tackle real-world challenges, including developing new technologies while preserving natural resources, which is of particular importance in South Dakota where our natural resources serve as a lifeblood to our economy.

**Student Learning Outcomes:**

1. Students demonstrate advanced knowledge pertaining to their area of research in chemical and biological sciences for a sustainable future.
2. Students will utilize contemporary methods, tools, and theory to perform research in their area of specialization.
3. Students demonstrate proficiency in developing a technically sound plan to address a research problem in chemical and biological sciences.
4. Students demonstrate effective oral and written communication skills relevant to chemical and biological sciences.
5. Students demonstrate and act with an understanding of professional and ethical responsibilities.

The outcome for graduates of the program will be assessed by (1) the scholarly activities (publications, presentations, and patents) of graduates, (2) the placement rate of graduates in research and development jobs in industries and academia, and (3) an alumni survey in 5 and 10 years.

---

<sup>3</sup> IPEDS

**Projected Enrollment:**

ESTIMATES	FISCAL YEARS*					
	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year
Students new to the university		3	4	4	4	4
Students from other university programs	3					
Students off-campus or distance continuing students		3	6	10	11	11
<b>Total students in the program (fall)</b>	<b>3</b>	<b>6</b>	<b>10</b>	<b>14</b>	<b>15</b>	<b>16</b>
Program credit hours (major Courses)**	54	108	180	252	270	288
Graduates					3	4
<i>*Do not include current fiscal year.</i>						
<i>**This is the total number of credit hours generated by students in the program in the required or elective program courses. Use the same numbers in Appendix B – Budget.</i>						

The enrollment estimates are based on the enrollment of graduate programs at South Dakota Mines and the number of research-active tenured and tenure-track faculty in the Department of Chemistry, Biology, and Health Sciences. The department has 10 tenured and tenure-track faculty. The current research expenditure of the department is approximately \$700K to \$800K annually and the research expenditure is projected to increase in the next few years. The department also offers a large number of general chemistry and biology lab courses (Chem 112L, Chem 114L, Biol 151L, and Biol 153L) instructed by graduate teaching assistants under the supervision of faculty, which provides support for four graduate teaching assistantships. When the program is in full capacity, Mines expects that the graduate research assistantships and graduate teaching assistantships will be able to support 16 or more graduate students annually.

**Projected Revenue/Expenses:**

FINANCIAL HEALTH SUMMARY						
	1st FY24	2nd FY25	3rd FY26	4th FY27	5th FY28	6th FY29
TUITION & FEE REVENUES	28,933	57,866	96,443	135,021	144,665	154,309
PROGRAM EXPENSES	215,104	215,104	215,104	215,104	215,104	215,104
NET (T&F REVENUES LESS PROGRAM EXPENSES)	<b>(186,172)</b>	<b>(157,239)</b>	<b>(118,661)</b>	<b>(80,084)</b>	<b>(70,440)</b>	<b>(60,795)</b>
OTHER SUPPORTING REVENUES	215,104	215,104	215,104	215,104	215,104	215,104
NET AFTER OTHER SUPPORTING REVENUES	<b>28,932</b>	<b>57,865</b>	<b>96,443</b>	<b>135,020</b>	<b>144,664</b>	<b>154,309</b>

No new resources (human or fiscal) are requested.

Review and evaluation of the proposed  
Ph.D. program in Chemical and Biological Sciences  
at the  
South Dakota School of Mines and Technology

Dr. Brent M. Peyton  
Director, Thermal Biology Institute  
MSU-NACOE Distinguished Professor  
Professor of Chemical and Biological Engineering  
Email: bpeyton@montana.edu, Phone: 406-994-7419  
Cobleigh Hall 305, Montana State University, Bozeman, MT 59717 USA

July 25, 2023

#### Executive Summary

I have examined the Ph.D. program proposal and supporting documents, interviewed faculty, staff, and administrators (online June 30, 2023), and evaluated related services where applicable. Overall, the proposal was very well written and thorough, addressing all required items with clear and thoughtful statements of the program vision. During the web-based interviews, I found the faculty, department head, and administration all to be enthusiastic and very supportive of the proposal.

Further, the proposed program fills a key gap in graduate student education in South Dakota. The proposed curriculum will develop a good base understanding in the field and will meet or exceed current national standards and expectations for the discipline, but has the flexibility for students to specifically tailor their course curriculum for today's multidisciplinary industrial and academic needs. I have suggested a few modifications to the core courses and other enhancements (e.g., professional ethics) to hopefully enhance the program's usefulness to all participants.

Through examination of their CV's and interviews, it appears that the current and planned faculty are very research-active and will be sufficient to offer a strong program, though I am concerned about the typically high teaching loads at SDSMT if they truly want to be a solid research institution as well as a strong teaching university.

I examined the SDSMT Devereaux Library *online* resources, where I checked the availability of some common, as well as less common, scientific journals. Online access to current technical information through the Devereaux Library appears sufficient to support a high-quality multidisciplinary research program. One concern that I do have is related to low office space allocation for the department's faculty and graduate students. This will become more of an issue (perhaps laboratory space as well) with this new Ph.D. program if the department and its graduate program grow as anticipated in the proposal. Further, I believe the program will attract new research faculty to SDSMT, which may exacerbate this problem.

No major other issues were noted during my examination of the Ph.D. program proposal and the subsequent online interviews with SDSMT administration and faculty; however, some minor suggestions for improvements were included.

The sections below provide some additional details on the questions outlined in the charge letter from Associate Vice President for Academic Programming, Dr. Pamela Carriveau. Overall, I feel this is a strong proposal and recommend that the South Dakota Board of Regents accept and implement this Ph.D. program.

### 1. Program Curriculum:

The proposed Ph.D. program in Chemical and Biological Sciences will advance SDSMT in key new areas of research by teaching fundamental interdisciplinary skills in chemistry and biotechnology to address needs in green and sustainable energy, environmental biotechnology, and biomedical health sciences. The proposed program fills a notable gap in graduate student education in South Dakota. The proposed curriculum will develop a good base understanding in the field and will meet or exceed current national standards and expectations for the discipline, but has the flexibility for students to specifically tailor their course curriculum for today's multidisciplinary industrial and academic needs. The program proposes requirements of 72 credits of graduate level courses. This exceeds typical national standards and expectations for the discipline. Many Ph.D. programs are requiring fewer credits than this to allow students to focus on their research and graduate in a reasonable time. The proposed program will provide students with solid training and preparation as they seek employment for industrial or academic careers. I have suggested a few modifications to the curriculum to hopefully enhance the program's usefulness to all participants.

**1a.** While I do believe the proposed core courses are a very good idea, I recommend that departmental faculty carefully examine national trends and whether so many required graduate course credits (72) are necessary. One thing to consider: the proposed program is novel but not one-of-a-kind. Other programs listed in the proposal, as well as Scripps Research Institute in La Jolla, CA, have a doctoral program in chemical and biological sciences. These other Ph.D. programs have significantly lower credit requirements and can be used as guideposts for curriculum, focus areas, etc., to ensure the success of this program at SDSMT.

**1b.** Carefully consider phasing in the six new courses proposed here, such that research-active faculty can balance increased teaching with the increased time allocation for research activities (proposal writing, lab management, mentoring, publishing, etc.) involved in building a strong Ph.D. program. It is important to clearly state here that faculty in this department are already doing much of this work with students from *other* departments.

**1c.** From the course description, the proposed new (and required) Chem/Biol 708 course seems perhaps too focused on emerging toxic contaminants in the environment to be valuable to all students in the program. Consider further examining the core underlying skills and knowledge needs of all students envisioned in the program and modify/broaden the focus of this specific course required for the Ph.D.

**1d.** Consider what prerequisites would be required for entering this program. Posting these on the departmental website will help with recruiting, as potential students would know whether (or not) they qualify for the program.

**1e.** With a broad multidisciplinary program and a new (non-traditional) Ph.D. program, consider developing named focus areas (e.g., sustainable energy or medical health science) to help students feel like they are developing a defined, valuable expertise that can be clearly expressed to future employers.

**1f.** No formal training was proposed to meet Primary Outcome 5: *Students demonstrate and act with an understanding of professional and ethical responsibilities*. I did not see anywhere in the proposal where this was addressed. Strongly consider requiring a first-year course or annual workshop in Professional and Research Ethics to meet this outcome.



## 2. Faculty:

Through an online interview with Department Head Dr. Zhu and another interview with a number of the departmental faculty, it appears that they are very enthusiastic about the proposed Ph.D. program and are fully invested in making it a success. Upon examination of their CV's, current faculty are very research-active and will be sufficient to offer a strong Ph.D. program. While a new faculty member currently being planned for hire may alleviate this somewhat, I am concerned about the typically high teaching loads (2:2) at SDSMT. If the Chemistry Biology and Health Sciences department truly wants to be a strong research institution as well as have a strong teaching focus, the department should aggressively try to reduce teaching loads on research-active faculty. Further, it seems the faculty will need to be even more successful at extramural funding (~\$1.6 million annually) to fully support 16 or more Ph.D. students for the program to come to full fruition.

The faculty have the expertise to offer the high-quality Ph.D. program that was proposed. Teaching, research, and service expectations will increase somewhat. However, in the online faculty interview, they were fully engaged and enthusiastically anticipating the new program. Many of the faculty are already heavily involved in active Ph.D.-level research, mentoring and funding Ph.D. students from other departments. No additional resources were requested specifically to staff the proposed program, but with new faculty coming on-board recently, it appears they have the related resources to be competitive when recruiting new faculty.

## 3. Services:

The library resources appear to be sufficient to support a high-quality program. I examined the SDSMT Devereaux Library *online* resources where I checked that SDSMT faculty and students appeared to have access to the "Web of Science" database for finding specific journal articles as well as the availability of some common and some less common scientific journals. The library seems to have an active interlibrary loan program for requesting delivery of materials that are not found on campus or in journal subscriptions. This service is free for campus faculty, staff and students. Online access to current technical information through the Devereaux Library appears sufficient to support a high-quality multidisciplinary research program.

With regard to other services, one concern that I have is related to low office space allocation for the department's faculty and graduate students. This problem was mentioned more than once in the interviews and will become more of an issue with this new Ph.D. program if the department and its graduate program grow as anticipated in the proposal. Further, I believe the program will attract new research faculty to SDSMT which may exacerbate this problem. Feedback from faculty on laboratory space indicated that it was currently sufficient but might become a problem once the proposed program is fully developed and all anticipated students join the labs.

## 4. Other Issues:

No major "other issues" were noted during my examination and review of the Ph.D. program proposal and the subsequent online interviews with SDSMT administration and faculty. One item that could be developed somewhat further in the proposal is program assessment. It is not clear who will do the proposed assessment or the assessment review of scholarly activities, placement rates for graduating students, and alumni surveys. One other item to consider in the recruiting plan is that recruiting BS engineering majors into a non-engineering Ph.D. program may be very difficult. Lastly, for SDSMT to grow into a higher tier research university, the graduate program would benefit from developing dedicated funding for supporting graduate programs including bridge funding (for students

with principal investigators between funded grants), Ph.D. completion grants, and travel supplement grants for Ph.D. student professional development. These programs, typically managed in the Graduate Dean's office, would help with graduate student retention as well as recruiting.

#### 5. Summary Recommendation:

Overall, this proposed Ph.D. program has many strengths, highlighted by the enthusiastic and talented research-active faculty and department head, as well as a supportive upper administration. Another strength is that the proposed program is novel but not one-of-a-kind. Other programs listed in the proposal, as well as Scripps Research Institute in La Jolla, CA, have a doctoral program in chemical and biological sciences. These other Ph.D. programs can be used as guideposts to ensure the success of this program at SDSMT. The program weaknesses are minor, but in my opinion adjustments could yield significant benefits particularly in the curriculum area by decreasing required credits, slight modifications of a core course, and a focus on actively teaching professional and research ethics, among others noted above. Another potential weakness is faculty burnout, and the Chemistry Biology and Health Sciences department should aggressively try to reduce teaching loads on research-active faculty. Current faculty funding appears near \$800K/yr and the faculty will need to significantly increase their success at extramural funding (~\$1.0 to 1.6 million annually) to fully support the proposed 16 or more Ph.D. students for the proposed program to come to full fruition.

Based upon this review, with a few minor modifications, I feel this is a strong proposal with a solid departmental team. I recommend that the South Dakota Board of Regents accept and implement this Ph.D. program.



Dr. Brent M. Peyton  
Director, Thermal Biology Institute  
MSU-NACOE Distinguished Professor  
Professor of Chemical and Biological Engineering



**Graduate Program External Review Report Response  
Chemical and Biological Sciences, Ph.D.**

The external consultant reviewed and evaluated the proposal and summarized their evaluation in a Report (Appendix F). South Dakota Mines was very pleased by the positive and supportive information contained in the report. The external consultant identified some recommendations for consideration, and we have made appropriate updates to the proposal to address the recommendations:

- **Recommendation 1: Reduce the Number of Credits to Below 72**
  - o University Action: During the external review, Dr. Peyton highlighted his own institution and others that require 60 credits beyond the bachelor's degree to earn a PhD. Ensuring the PhD programs offered at South Dakota Mines are relevant, current, and keeping pace with national trends are certainly priorities, given the number of policies and departments that would be impacted by a change to reduce the required number of credits, the institution wants to be judicious and pragmatic in an approach to doing so. As such, the institution will proceed with the proposed Chemical and Biological Sciences (PhD) requiring 72 credits, but will begin conducting research on the issue to explore it more fully and determine if a future change to reduce the number of required credits is appropriate.
- **Recommendation 2: Create a Plan to Phase-in New Courses**
  - o University Action: To ensure new and current research-active faculty are supported to be successful, the Department Head has developed a plan to appropriately phase-in the new courses.
- **Recommendation 3: Update Content of CHEM/BIOL 708 for Wider Student Appeal**
  - o University Action: The recommendation to broaden the content of CHEM/BIOL 708 was greatly appreciated. The Department Head and faculty have engaged in discussions and made updates to the course description to ensure it has the broad foundational content appropriate for a core course in a multidisciplinary program like the Chemical and Biological Sciences (PhD).
- **Recommendation 4: Clearly Identify Program Admission Requirements (Pre-requisites) and Post Them on the Website**
  - o University Action: The program indeed has the admission requirements established, to include acceptable bachelor's and/or master's degrees and coursework, and when the program is fully approved, will ensure that the admission requirements and pre-requisite coursework is clearly identified for prospective students.
- **Recommendation 5: Consider Areas of Focus in the Degree**
  - o University Action: Areas of Focus/Specializations are something the department has strongly considered. Once the program is fully approved, the institution plans to look holistically at the bachelor's and master's degrees currently offered in the department to identify potential changes to the existing Master of Science degree, as well as adopting some specializations on the PhD degree, to ensure students have a defined path to develop discipline/field expertise that can be clearly communicated to their future employers.
- **Recommendation 6: Require First-Year Course/Workshop in Professional and Research Ethics to Meet Program Learning Outcome #5**

- University Action: In response to the recommendation, the department will incorporate professional and research ethics content into the Seminar courses students are required to take in the program.
- University Action: Currently, all undergraduate student workers, graduate research assistants, and post-doctoral researchers who are paid on grants from agencies that require ethics training (NSF, USDA, NIH) must successfully complete the CITI Responsible Conduct of Research Training. The costs of the training are covered by the Office of Research Affairs and the Interim Vice President of Research is actively considering requiring this training for all students and post-doctoral researchers who are paid to participate in research activities.
- **Recommendation 7: Increase Office Space Allocation for Faculty and Graduate Students**
  - University Action: The institution purchased a building on campus in academic year 2022/2023 for the specific purpose of providing additional space to adequately support expanding research endeavors. With this building purchase finalized and Research Affairs/Office of Sponsored Programs staff moved from their existing space in an administration building to the new building, remodel and additional relocation plans are in place that will ultimately provide more lab and office space for faculty and graduate students:
    - Two faculty in the Chemistry, Biology, and Health Sciences (CBHS) department have research centers and labs which will be relocated from the current building to the newly purchased building. In addition to space for research labs, the newly purchased building also has the ability to accommodate other working/office space for faculty and graduate students.
    - The Office of Graduate Education is currently housed just down the hall in the same building from the CBHS department faculty. There are plans to remodel the space in the administrative building formerly occupied by Research Affairs/Office of Sponsored Programs and relocate the Office of Graduate Education to that space. The former space occupied by the Office of Graduate Education would then be remodeled into additional space for chemistry and biology.
  - University Action: The Dean of Graduate Education is actively working with Department Heads to identify and review existing office space for graduate students. The goals of the review include making improvements to the existing spaces and ensuring the most efficient space utilization.
- **Recommendation 8: Develop Dedicated Funding for Supporting Graduate Programs, Including Bridge Funding to Support Students Between Funded Grants and Completion Grants**
  - University Action: This is an important issue, and the recommendation is appreciated. While Department Heads are certainly willing to respond to individual requests from faculty regarding potential funding needs to support their graduate students during gaps in funded grants, there is an awareness that an institutional-level philosophy and commitment would be valuable. As such, the President, Interim Vice President of Research, Provost, and Dean of Graduate Education have committed to having a discussion about a holistic approach to graduate student financial support and exploring options to best support graduate students throughout their academic career at the institution.