

**SOUTH DAKOTA BOARD OF REGENTS**

**Academic and Student Affairs**

**AGENDA ITEM: 9 – G (1)**

**DATE: June 28-30, 2016**

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**SUBJECT: Intent to Plan: SDSU MS in Human Biology**

South Dakota State University (SDSU) has submitted an Intent to Plan requesting approval to develop a Master of Science (MS) program in Human Biology. Approval or waiver of an Intent to Plan is required prior to submitting a formal program proposal. The program will provide graduate-level preparation for students who desire admission to professional schools in human healthcare, including but not limited to Doctor of Osteopathic Medicine (DO), Doctor of Optometry (OD), Doctor of Chiropractic (DC), and Doctor of Dental Surgery (DDS). SDSU believes the program is unique to the SDBOR system and the region by focusing on preparation for admission to professional schools. The intent to plan also specifies providing an accelerated graduation option for students by allowing twelve graduate credit hours to contribute to the bachelor's degree.

**University Mission and System Strategic Goals**

The proposed major in Human Biology is within the statutory mission of SDSU as provided in SDSCL 13-58-1: *Designated as South Dakota's land grant university, South Dakota State University, formerly the state college of agriculture and mechanical arts, shall be under the control of the Board of Regents and shall provide undergraduate and graduate programs of instruction in the liberal arts and sciences and professional education in agriculture, education, engineering, home economics, nursing and pharmacy, and other courses or programs as the Board of Regents may determine.* The proposed program aligns with Board of Regents' Strategic Plan

(Continued)

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**DRAFT MOTION 20160628\_9-G(1):** I move to authorize SDSU to develop a proposal for an M.S. in Human Biology with the following conditions:

1. The university will research existing curricula, consult with experts concerning the curriculum, and provide assurance in the proposal that the program is consistent with current national standards and with the needs of employers.
2. The proposal will define the specific knowledge, skills, and competencies to be acquired through the program, will outline how each will be obtained in the curriculum and will identify the specific measures to be used to determine whether individual students have attained the expected knowledge, skills, and competencies.
3. The university will not request new state resources and the program proposal will identify the sources and amounts of all funds needed to operate the program and the impact of reallocations on existing programs.

2014-2020 by growing the number of new graduate programs, aligning programs workforce needs, and promoting STEM education.

### **Related Programs in the System**

The University of South Dakota (USD) offers an MS in Basic Biomedical Sciences and an MS/MA in Biology. However, graduates of those programs typically enter the workforce upon completion of the program. The proposed MS in Human Biology is specifically designed to give students an edge in applying to professional schools in human healthcare.

### **Workforce Need, Student Demand, Projected Graduates**

Graduates of the program are expected to be competitive in acceptance to professional schools in healthcare. South Dakota has a demonstrated need for primary care and rural healthcare providers; SDSU hopes that by increasing the number of South Dakota graduates enrolled in professional schools in the region, many will return to or remain in the state after graduation. Graduates are also expected to enter the workforce in the areas of biological and biomedical systems or teach biology. SDSU expects the program will graduate 15-20 students per year after full implementation.

### **Board Policy**

SDSU is not requesting any exceptions to Board Policy.

### **Off Campus and Distance Delivery**

SDSU does not intend to request authorization for off campus or distance delivery of the program.

### **Budget and Resources**

SDSU is not requesting new funds or State resources to offer the program.

**South Dakota Board of Regents**  
**Intent to Plan for a M.S. in Human Biology**

<b>UNIVERSITY:</b>	<b>South Dakota State University</b>
<b>DEGREE(S) AND TITLE OF PROGRAM:</b>	<b>M.S. in Human Biology</b>
<b>INTENDED DATE OF IMPLEMENTATION:</b>	<b>Fall 2017</b>

**University Approval**

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

*David L. Chicoine*

\_\_\_\_\_  
 President of the University

April 27, 2016

\_\_\_\_\_  
 Date

After approval by the President, a signed copy of the proposal should be transmitted to the Executive Director. Only after Executive Director review should the proposal be posted on the university web site and the Board staff and the other universities notified of the URL.

**1. What is the general nature of the proposed program? What is the expected demand for graduates in South Dakota? What is the need for the proposed program?**

South Dakota State University (SDSU) requests authorization to plan an M.S. in Human Biology. The M.S. in Human Biology is designed to provide graduate-level preparation for students who desire admission to professional schools in human healthcare. This includes but is not limited to programs such as: Doctor of Osteopathic Medicine (D.O.), Doctor of Optometry (O.D.), Doctor of Chiropractic (D.C.), Doctor of Dental Surgery (D.D.S), Master of Science – Physician Assistant Studies (M.S. – PAS), and Allopathic Medical Doctor (M.D.). The United States higher education landscape includes many programs with similar goals<sup>1</sup>, however the proposed program is unique to the SDBOR system and the region. This program directly strengthens the academic capacity of the student with special attention to advanced content knowledge and case based application, professional development and professional skills needed by the healthcare provider. The current regental biology master's programs strengthen the academic capacity by devoting considerable effort to teaching research skills. While graduate-level research skills are important to many related industries these skills are not highly valued, nor required, for admission to professional programs in healthcare. In contrast to graduate degrees with many thesis credits, this proposed program provides academic and professional skills known to maximize likelihood of admission to professional programs in healthcare.

The M.S. in Human Biology provides graduate-level preparation for students for successful admission to professional schools. This includes students who were not admitted directly to professional school from an undergraduate program, have diverse backgrounds and are first-generation college students. For example, in 2013, 19 SDSU students applied to professional schools but were unsuccessful. These were very high achieving students as indicated by their GPA greater than 3.3 and MCAT scores between 20 and 28, but, nevertheless, needed slightly more preparation to achieve admission. The proposed M.S. program allows for additional opportunities to demonstrate their academic excellence and polish their professional skills.

<sup>1</sup> <https://apps.aamc.org/postbac/#/index>

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SDSU does not intend to request new State resources to develop or implement this program. An FTE will be required and will be in direct relationship to the new credit hours generated from this new program (i.e. the credit hour generation for this program will “cover the costs” of the investment in staffing needs).

*Workforce Demand for Graduates*

The M.S. Human Biology is intended to help students whose undergraduate credentials are not quite sufficient to compete successfully for admission to programs that offer further professional training in an area of specialized health care delivery (e.g. Doctor of Osteopathic Medicine (D.O.), Doctor of Optometry (O.D.), Doctor of Chiropractic (D.C.), Doctor of Dental Surgery (D.D.S), Master of Science – Physician Assistant Studies (M.S. – PAS), Allopathic Medical Doctor (M.D.), etc.). The South Dakota Department of Health shows that most counties within South Dakota currently have a shortage of primary care providers.<sup>2</sup> Additionally, research conducted by ACT shows that in 2014, although interest in STEM careers is high in South Dakota, the student’s academic preparedness in STEM needs to improve.<sup>3</sup> This new program will supply graduates to fill this shortage and academic preparedness shortfall by providing an opportunity for a greater number of successful applicants to professional programs within and outside of the state.

*Need for the Program*

There is a need to provide additional opportunities for preparation of students in the region and nation to be highly competitive applicants to Medical, Dental, Chiropractic, Optometry, and Physician Assistant programs. The need for primary care and rural healthcare providers is high in SD. The best way to address this need is to prepare people who are SD residents and have the capability and desire to serve in these crucial locations and roles. The assessment of the current landscape within professional school admissions and SDSU Biology & Microbiology’s prior successes in this preparing healthcare professionals provides confidence in successful placement into D.O., O.D., D.C., D.D.S., M.D., and M.S - PAS programs. Between 2011-2015, 98 of 159 SDSU students were admitted to the six areas of professional training (listed above) to programs outside of South Dakota. Nearly 74% of South Dakota residents who attend SDBOR institutions stay in the state to work or pursue additional higher education<sup>4</sup> so it can be extrapolated that increasing the successful admission of SD residents to professional programs across the country will yield higher numbers of practitioners who intend to return to South Dakota upon receiving their professional licensure.

This M.S. degree will require completion of only coursework; completion of a thesis or research paper is not required. Curricula will be developed and scheduled to ensure completion of the program within one calendar year. In addition to life-science content, the program will contain learning outcomes for enhanced professional development essential to successful admission to professional programs in healthcare. To reduce the financial burden on students, this program will likely allow the use of graduate credits to be counted for both the graduate and undergraduate degrees (SDBOR 2:8). Current SDSU policy allows up to 12 graduate credit hours to contribute to the bachelor’s degree. Students who chose not to pursue professional school upon graduation will be able to transition into a Plan A or Plan B M.S. or Ph.D. program. They will also be

<sup>2</sup> <https://doh.sd.gov/documents/Providers/RuralHealth/HPSA.pdf>

<sup>3</sup> <http://www.act.org/stemcondition/14/pdf/SouthDakota.pdf>

<sup>4</sup> <https://sdbor.edu/mediapubs/factbook/documents/FY16Factbook.pdf>

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competitive entrants into the workforce using their broad in-depth knowledge of biological and biomedical systems. According to Carnevale<sup>5</sup> graduates of STEM programs “competencies are valued in a growing share of highly paid non-STEM occupations”. This is highlighted by the data indicating that across nearly all sectors STEM graduates earn significantly higher salaries, even when working in non-stem fields.<sup>6</sup> Additionally MS graduates will have the skills to teach in higher education.

**2. What is the relationship of the proposed program to the University’s mission as provided in South Dakota statute and Board of Regents Policy?**

Providing opportunity for student success in professional careers lies within SDSU’s responsibility as a land-grant institution. This M.S. program is designed to help prepare and make competitive residents of the state, region and nation to successfully be admitted and find success in professional programs in healthcare.

The proposed M.S. in Human Biology is within the statutory mission of SDSU as provided in SDCL 13-58-1: *Designated as South Dakota’s land grant university, South Dakota State University, formerly the state college of agriculture and mechanical arts, shall be under the control of the Board of Regents and shall provide undergraduate and graduate programs of instruction in the liberal arts and sciences and professional education in agriculture, education, engineering, home economics, nursing and pharmacy, and other courses or programs as the Board of Regents may determine.*

Board Policy 1:10:2 South Dakota State University Mission Statement provides: *The legislature established South Dakota State University as the Comprehensive Land Grant University to meet the needs of the State and region by providing undergraduate and graduate programs of instruction in the liberal arts and sciences and professional education in agriculture, education, engineering, human sciences, nursing, pharmacy, and other courses or programs as the Board of Regents may determine (SDCL 13-58-1).*

As the state’s land-grant institution, SDSU provides opportunities for all students of the state and region to prepare themselves for successful admission to professional programs in healthcare. The Department of Biology & Microbiology has a long history of preparing students for careers as future leaders and professionals in healthcare and this program continues to build upon that previous success. This program is designed to help prepare and make competitive residents of the state, region, and nation to successfully be admitted and find success in professional programs in healthcare.

The proposed M.S. in Human Biology supports the goals stated in the South Dakota Board of Regents Strategic Plan 2014-2020:

*Goal 1 – Student Success*

- Increase total degrees awarded

*Goal 2 – Academic Quality and Performance*

- Grow the number of students participating in experiential learning

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<sup>5</sup> <https://www.census.gov/programs-surveys/acs/>

<sup>6</sup> <https://cew.georgetown.edu/report/stem/>

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- Grow the number of new graduate programs

*Goal 3 – Research and Economic Development*

- STEM Education
- Economic Development

The M.S. in Human Biology also supports South Dakota State University’s strategic plan, IMPACT 2018<sup>7</sup>, specifically:

*Goal 1 – Academic Excellence*

- Promote academic excellence through quality programs, engaged learners and an innovative teaching and learning environment.

*Goal 2 – Research and Innovation*

- Generate new knowledge, encourage innovations and promote artistic and creative works that contribute to the public good and result in social, cultural or economic development for South Dakota, the region, the nation and the world.

**3. Are there any related programs in the regental system? If there are related programs, why should the proposed program be added? If there are no related programs within the system, enter “None.”**

No equivalent. Some similar regental programs are listed below, however both have a research component (i.e. a thesis or research paper is program requirement).

University of South Dakota  
Basic Biomedical Sciences (M.S.)  
Biology (M.S. and M.A.)

In our experience, failed applications to professional schools, result not from lack of research experience, but from inadequate undergraduate academic performance and weak professional skills. This program is designed to academically strengthen the student while also developing the professional skills needed for a successful interview and professional career. These skills include but are not limited to oral and written communication, scientific and biomedical content knowledge application, and problem solving skills.

**4. Are there related programs at public colleges and universities in Minnesota, North Dakota, Montana, and Wyoming?<sup>8</sup> If there are related programs in these states list below under each state and explain why the proposed program is needed in South Dakota. If there are no related programs in a state, enter “None” for that state.**

Minnesota  
University of Minnesota  
Master of Arts in Bioethics  
*(The program does not include rigorous biological, or biomedical science content)*

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<sup>5</sup> <http://www.sdstate.edu/impact2018>

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North Dakota

North Dakota State University

B.S. & M.S. in biological sciences

*(The program is focused on preparing students for careers in research, thus is distinctly different in focus and outcome from the proposed M.S. Human Biology.)*

Montana

Montana State University

Master of Science in Health Science

*(The program is capped at 30 students.)*

Wyoming

None

**5. Are students expected to be new to the university or redirected from other programs? How many majors are expected in the first years of the program? How many graduates are expected?**

These students will be new to SDSU graduate programs. Students would be recruited primarily from the SDSU undergraduate Biology & Microbiology majors however admission is open to all qualified students. Few, if any, students are expected to move from their current graduate program to enroll in the M.S. Human Biology. The program predicts to enroll and graduate 15-20 students per year.

**6. Does the university intend to seek authorization to deliver this entire program at any off-campus locations? *No* Does the university intend to seek authorization to deliver this entire program by distance technology? *No***

Off-campus	No
Distance delivery	No

**7. What are the University's plans for obtaining the resources needed to implement the program? Indicate "yes" or "no" in the columns below.**

	Development/Start-up	Long-term Operation
Reallocate existing resources	Yes	Yes
Apply for external resources	No	No
Ask Board to seek new State resources	No	No
Ask Board to approve new or increased student fee	No	No

Newly generated tuition and fees from new graduate course enrollments will generate funding required to appoint one (1) new FTE to serve as the Director or Coordinator of the M.S. in Human Biology. This position will oversee recruitment, admission process, provide academic advising, teach selected courses and coordinate the M.S. program.

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**8. Curriculum Example: Provide (as Appendix A) the curriculum of a similar program at another college or university. *The Appendix should provide the required and elective courses in the program. Catalog pages or web materials may be used. Identify the college or university and explain why the program may be used as one model when the proposed program is developed.***

Appendix A identifies a model curriculum.

The model curriculum from Colorado State University most closely parallels SDSU's intended outcomes and 1-year timeline. SDSU's intent is to support students and provide additional curricular opportunities for students to improve their application profile and readiness for professional education in healthcare. The unique aspect of the SDSU curriculum is the ability to complete the coursework within 1 academic year by beginning graduate coursework within the final undergraduate semester. This cohort model of coursework and intense individual co-curricular advising will provide opportunities for students to best enhance their application to professional schools.



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## **Appendix A**

### **Curriculum Example: Colorado State University - M.S. in Biomedical Sciences**

Additional information regarding the M.S. in Biomedical Sciences may be found at:

<http://csu-cvmbms.colostate.edu/academics/bms/Pages/one-year-master-science-biomedical-sciences.aspx>

#### **Human Anatomy Core Curriculum:**

- Managing a Career in Science - BMS610A (1 credit; Fall semester)
- Mammalian Physiology I - BMS500 (4 credits; Fall semester)
- Mammalian Physiology II - BMS501 (4 credits; Spring semester)
- Neuroanatomy - BMS545 (5 credits; Spring semester)
- Human Anatomy Dissection - BMS575/BMS619 (6 credits; Fall semester)

#### **Animal Anatomy Core Curriculum:**

- Managing a Career in Science - BMS610A (1 credit; Fall semester)
- Mammalian Physiology I - BMS500 (4 credits; Fall semester)
- Mammalian Physiology II - BMS501 (4 credits; Spring semester)
- Neuroanatomy - BMS545 (5 credits; Spring semester)
- Domestic Animal Dissection - BMS531/633 (5 credits; Spring semester)

#### **Neurobiology Core Curriculum:**

- Managing a Career in Science - BMS610A (1 credit; Fall semester)
- Mammalian Physiology I - BMS500 (4 credits; Fall semester)
- Neuroanatomy - BMS545 (5 credits; Spring semester)
- Developmental Neurobiology - BMS503 (3 credits; Spring semester)
- Neuronal Circuits, Systems and Behavior - BMS505 (3 credits; Spring semester)

The program curriculum requires the completion of 32 credits of coursework, consisting of a core curriculum (listed above) plus electives. The prescribed curriculum is completed in one year, beginning only during the Fall semester, culminating in a final comprehensive examination on the core curriculum in late May/early June. One's chosen option determines one's core curriculum and the electives may be selected from university-wide offerings as long as they are 300-level or greater. This offers maximum flexibility for students to tailor the program to their individual needs. Regardless of the option chosen (human anatomy, animal anatomy, neurobiology) all students receive a master's degree in biomedical sciences.