

**SOUTH DAKOTA BOARD OF REGENTS**

**Academic and Student Affairs**

**AGENDA ITEM: 7 – D (1)**

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

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**SUBJECT: New Certificate: NSU Certificate in Biotechnology Entrepreneurship**


Northern State University (NSU) requests authorization to offer an undergraduate certificate in Biotechnology Entrepreneurship. The certificate will aid in preparing students for the growing biotechnology industry in South Dakota, an industry that the Governor’s Office of Economic Development has identified as a targeted industry for the state. Students enrolled in the certificate programs are likely to come from science majors looking to increase their knowledge in business and entrepreneurship, as well as business students looking to acquire a science background. The certificate consists of twelve credit hours and does not require the creation of any new courses.

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**DRAFT MOTION 20160628\_7-D(1):** I move to approve NSU’s undergraduate Certificate in Biotechnology Entrepreneurship as described in Attachment I.

**SOUTH DAKOTA BOARD OF REGENTS**  
**Certificate Request**

This form is to be used to request approval for a new certificate program that includes currently offered courses. A certificate program is not a major or minor. Refer to BOR policy 2:23 Certificate Programs.

<b>Northern State University</b>	<b>Biology, Chemistry &amp; Physics, and Mathematics</b>		2/23/16
<b>Institution</b>	<b>Division/Department</b>	<b>Institutional Approval Signature</b>	<b>Date</b>

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**1. Name of Program:** Certificate in Biotechnology Entrepreneurship

**2. Provide a justification for the program.**

The program will be designed to prepare students for entry-level positions that will meet the growing needs of the biotechnology industry in South Dakota and surrounding states. It will also help prepare students interested in starting or managing a business related to biotechnology.

The proposed Certification in Biotechnology Entrepreneurship supports the System Strategic Goals (Board Policy 1: 21) and State initiatives:

- Educational attainment: increase college participation rates; increase number of graduates
- Economic development: expand programs to meet workforce needs
- Governor's Office of Economic Development: Biotechnology is a targeted industry.<sup>1</sup>

Biotechnology is broadly defined as any technical application that uses biological systems and/or organisms for the purposes of making or modifying products or processes for specific uses.<sup>2</sup> Techniques in biological research have been used to improve agricultural crops, conduct DNA recombinant DNA technologies for multiple purposes, and to improve or produce pharmaceuticals. Biotechnology combines the fields of genetics, molecular biology, biochemistry, microbiology, and cell biology and links them to applications in disciplines such as chemical engineering, information technology, and biorobotics. As such, a strong background in biotechnology is becoming a necessity in clinical and research laboratories across the nation.

The option of obtaining a Certification in Biotechnology Entrepreneurship is intended augment NSU's current AS Degree in Biotechnology by providing students exposure to potential careers beyond the laboratory; those who dream of starting a new biotechnology enterprise. The curriculum builds upon a strong foundation in the biotechnology sciences through addition of an interdisciplinary focus addressing the business entrepreneurship challenges organizations face in the biotechnology industry. The goal: to enhance a student's ability to develop potential small business ventures which are generated from combining fundamental biotechnology learnings in an applied setting.

<sup>1</sup> [http://www.sdreadytowork.com/targets\\_links.asp](http://www.sdreadytowork.com/targets_links.asp)

<sup>2</sup> Merriam-Webster. 2009. <http://www.merriam-webster.com/dictionary/biotechnology>. 15 May 2009. Merriam-Webster Online Dictionary, Inc.

NSU is a member of the South Dakota Biotech Association, which directly links the University to 65 companies and organizations in the state and to the BIO International Organization both nationally and globally. Potential internship sponsors and employers of graduates of this program in eastern South Dakota include 3M Co., Sanford Applied Biosciences, LLC, SD WheatGrowers Association, Sanford Health, Avera St. Luke's Hospital, Glacial Lakes Energy, LLC., POET, Redfield Energy, Monsanto, A & B Serum Co., and AlphaGenix Inc., among others. The program's curriculum will rely heavily on hands-on experimentation and lab techniques along with a mandatory internship component. Because of this practical training and the need for qualified workers, there will be opportunities for students to obtain permanent employment at their internship sites.

There is a rise in biotechnology companies nationwide. Demand for graduates in biotechnology will continue to increase in the Midwest due to a rise in the number of laboratories, research centers, and hospitals. Entry salaries average ~\$42,000, depending on the location and company (payscale, 2015)<sup>3</sup>. Because of the short duration (*i.e.*, two years of coursework and training) and the possibility of immediate employment, students entering into the biotechnology program will find their educational investments to be worthwhile. Additionally, students wishing to complement their BS studies in Biology, Environmental Sciences and Chemistry with an AS in Biotechnology are finding themselves qualified for more job opportunities across numerous disciplines (biotechnologydegrees.org)<sup>4</sup>.

Few biotechnology programs exist in states near South Dakota and the biotechnology industry is growing in eastern South Dakota. This presents a unique opportunity for NSU to increase the number of degree programs the institution offers while using the expertise of faculty members in the Department of Biology and the School of Business. An example of one such area seeing a rise in start-up, venture capital growth, is in agriculture. Data from the Cleantech Group (2015)<sup>5</sup>, shows that agricultural technology attracted \$277 million in investment in 2014, up from \$266 million in 2013. Small entrepreneur businesses with innovative ideas are being sought by larger companies and viewed as innovation incubators, providing 'proof-of-concept' ideas by which the larger companies can hopefully take advantage of through partnerships. The need to educate and train students in biotechnology is apparent due to demand in the workforce and the lack of programs in our region. Joni Johnson, Executive Director of the South Dakota Biotech Association, stated that NSU's implementation of an Associate's degree in Biotechnology has been "exciting news for our industry and continues to show how SD is strongly committed towards building and strengthening the State's infrastructure through biotechnology<sup>6</sup>."

A recent partnership (December, 2015) with the John S. and James L. Knight Foundation and the University of North Dakota (Grand Forks, ND) Center for Innovation has provided an outstanding opportunity for students at NSU to explore, investigate and collaborate on innovative ideas which are the foundation of entrepreneurship. Biotechnology is a critical component of this new venture and offering students at NSU the opportunity to focus their studies in an entrepreneurship-way will provide students with the hands-on nature of "out of the box" partnering. This not only will will strengthen students' abilities to bridge multiple disciplines and enable strong interpersonal skills; but will provide them with the resources to potentially form their own businesses or non-profit organizations. This ultimately, strengthens the economic communities.

## References:

<sup>1</sup> [http://www.sdreadytowork.com/targets\\_links.asp](http://www.sdreadytowork.com/targets_links.asp)

<sup>2</sup> Merriam-Webster. 2009. <http://www.merriam-webster.com/dictionary/biotechnology>. 15 May 2009. Merriam-Webster Online Dictionary, Inc.

<sup>3</sup> <http://www.payscale.com/research/US/Job>

<sup>4</sup> <http://www.biotechnologydegrees.org>

<sup>5</sup> <http://cen.acs.org/articles/93/i19/Entrepreneurs-See-New-Field-Dreams.html>

<sup>6</sup> Joni Johnson, Executive Director, South Dakota Biotech Association, Personal Communication, 09/15.

### 3. Who is the audience for the program?

Undergraduate biotechnology, biology, chemistry, and environmental science students who, in addition to their chosen majors, seek to enhance their knowledge base with courses enabling them to develop their own business ideas. Simultaneously, students majoring in business may find this certificate useful if they have an interest in science.

### 4. List the courses to be completed, the credit hours of each course, and the total number of credit hours required for the program.

Prefix & #	Title	Credit Hrs
BIOL 235/235L	Introduction to Biotechnology/Lab	3
BIOL 240/240L	Biotechnology Methods and Techniques/Lab	3
BADM 336	Entrepreneurship I	3
BADM 438	Entrepreneurship II	3
<b>Total Credit Hours Required</b>		<b>12</b>

5. Proposed CIP code 261201  
 Department Code **NBIOL**

6. Effective Date of Certificate Program Fall 2016