

**SOUTH DAKOTA BOARD OF REGENTS**

**Academic and Student Affairs**

**AGENDA ITEM: 4 – K (1)**

**DATE: March 30 – April 1, 2016**

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**SUBJECT: New Certificate: SDSU Graduate Certificate in Data Science**

South Dakota State University (SDSU) requests authorization to offer a graduate certificate in Data Science. The proposed graduate certificate will provide a professional development path for working professionals and others who want to develop data science fluency, but choose not to commit to the MS in Data Science program. Potential students are expected to come from the fields of health care, finance, manufacturing, agriculture, and government. The certificate consists of 12 credit hours.

SDSU is requesting authorization to offer the graduate certificate through online distance delivery.

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**RECOMMENDED ACTION OF THE EXECUTIVE DIRECTOR**

I move to approve SDSU's new certificate request for a Graduate Certificate in Data Science as described in Attachment I.

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

<b>SDSU</b>	<b>Engineering / Mathematics &amp; Statistics</b>	<b>Laurie Stenberg Nichols</b>	<b>2/10/16</b>
<b>Institution</b>	<b>Division/Department</b>	<b>Institutional Approval Signature</b>	<b>Date</b>

**1. Name of Program:** Data Science

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

Data Science is the science of extracting actionable knowledge from raw data using both modern and traditional statistical techniques in conjunction with high performance computing capabilities. SDSU currently offers the M.S. in Data Science. The proposed graduate certificate in Data Science will provide a professional development path for working professionals and others who want to develop substantial data science fluency in order to enhance their value in modern, data-intensive professional environments, but who cannot or do not need to commit to the full MS in Data Science program.

As described in section 3 below, individuals working in a wide variety of disciplines of substantial importance to our state and region would benefit from the proposed certificate. By adding high-level data analysis and interpretation skills to their existing skill sets, they increase their ability to help their organizations use data to make better decisions. Thus, both individuals and the organizations they lead or by which they are employed would benefit from the existence of this certificate.

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

This graduate certificate in Data Science is primarily intended for working professionals and others who want to develop substantial data science fluency in order to enhance their value in modern, data-intensive professional environments. Those individuals could come from a wide variety of professional fields of importance to our state and region, including health care, finance, manufacturing, agriculture, and government. For example, the Chief Data and Analytics Officer of Sanford Health has expressed an interest in hiring people with data science skills to work in every division of this \$4B per year corporation, from business operations through health care delivery optimization and on to medical research support. Similarly, in our state's financial sector, data science skills are used on a daily basis in risk management, product development, fraud and money laundering detection, operations optimization, marketing, and elsewhere. Manufacturing is also increasingly turning to data science, as evidenced by the interest of Daktronics and Raven Industries in our department's graduates. In modern agriculture, precision agriculture is a data intensive industry of importance to South Dakota that will require skilled data science professionals. To see the growing evidence of the importance of data science to governmental agencies, one need look no further than the February 2015 creation of the position of Chief Data Scientist for the United States government. In addition to the U.S. government, many states and metropolitan areas have been using advanced data science techniques to enhance their decision and policy making for years.

By design, the proposed certificate would be accessible to people who studied in a variety of undergraduate majors. While mathematics and statistics majors would be welcome in the program, this

level of quantitative background is not necessary. Those with undergraduate degrees in economics, finance, the physical sciences, engineering, and computer science would all have the required undergraduate coursework background necessary to succeed. Many with undergraduate degrees in business, the life sciences, and the social sciences may also have the required background.

All courses in the proposed certificate program are already offered online on a regular basis, enhancing its ability to serve the intended audience that includes working professionals whose ability to travel to campus regularly may be limited.

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

<b>Prefix &amp; #</b>	<b>Title</b>	<b>Credit Hrs</b>
STAT 541	Statistical Methods II	3
STAT 700	Statistical Programming	3
STAT 701	Modern Applied Statistics I	3
STAT 702	Modern Applied Statistics II	3
<b>Total Credit Hours Required</b>		<b>12</b>

**5. Proposed CIP code** 27.0501 Statistics, General

**6. Effective Date of Certificate Program** Summer 2016