SOUTH DAKOTA BOARD OF REGENTS

Academic and Student Affairs
Consent

AGENDA ITEM: 4 – F (2)
DATE: December 5-7, 2017

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SUBJECT
New Certificate: DSU Certificates in Cybersecurity, Network Services, & Software Development

CONTROLLING STATUTE, RULE, OR POLICY
BOR Policy 2:23 – Program and Curriculum Approval
BOR Policy 2:12 – Distance Education
AAC Guideline 2.11 – Request to Offer an Existing Degree Program at a New Site

BACKGROUND / DISCUSSION
Dakota State University (DSU) requests authority to offer undergraduate certificates in Cybersecurity, Network Services, and Software Development.

The certificates target traditional age students unsure of committing to a full bachelor’s programs and non-traditional students seeking high demand workforce skills. Graduates of these certificate programs will receive entry-level skills and experience leading to careers as computer scientists, software engineers, programmers, security specialists, and other computing professionals. All three of the certificates stack to associate and bachelor’s degree programs, providing certificate holders with options for additional higher education in addition to applicable workforce skills. The proposed certificates consist of twelve credit hours each and include previously approved courses.

DSU requests authorization to offer the certificates online and at the UC-Sioux Falls.

IMPACT AND RECOMMENDATION
DSU currently has 17 undergraduate certificate programs available. DSU does not request new resources to offer the certificates.

Board staff recommend approval of the certificates.

ATTACHMENTS
Attachment I – DSU New Certificate Request Form: Cyber Security
Attachment II – DSU New Certificate Request Form: Network Services
Attachment III – DSU New Certificate Request Form: Software Development

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DRAFT MOTION 20171205_4-F(2):
I move to approve DSU’s undergraduate certificates in Cybersecurity, Network Services, and Software Development as presented.
SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Certificate

Use this form to propose a certificate program at either the undergraduate or graduate level. A certificate program is a sequence, pattern, or group of academic credit courses that focus upon an area of specialized knowledge or information and develop a specific skill set. Certificate programs typically are a subset of the curriculum offered in degree programs, include previously approved courses, and involve 9-12 credit hours including prerequisites. In some cases, standards for licensure will state explicit requirements leading to certificate programs requiring more than 12 credit hours (in such cases, exceptions to course or credit requirements must be justified and approved). The Board of Regents, Executive Director, and/or their designees may request additional information about the proposal. After the university President approves the proposal, submit a signed copy to the Executive Director through the system Chief Academic Officer. Only post the New Certificate Form to the university website for review by other universities after approval by the Executive Director and Chief Academic Officer.

<table>
<thead>
<tr>
<th>UNIVERSITY:</th>
<th>DSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE OF PROPOSED CERTIFICATE:</td>
<td>Certificate in Network Services</td>
</tr>
<tr>
<td>INTENDED DATE OF IMPLEMENTATION:</td>
<td>Fall 2018</td>
</tr>
<tr>
<td>PROPOSED CIP CODE:</td>
<td>11.0901 Computer Systems Networking and Telecommunications</td>
</tr>
<tr>
<td>UNIVERSITY DEPARTMENT:</td>
<td>Beacom College of Computer &amp; Cyber Sciences</td>
</tr>
<tr>
<td>UNIVERSITY DIVISION:</td>
<td></td>
</tr>
</tbody>
</table>

University Approval

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

[Signature]
Institutional Approval Signature
President or Chief Academic Officer of the University

11/27/2017
Date

1. Is this a graduate-level certificate or undergraduate-level certificate (place an “X” in the appropriate box)?

   Undergraduate Certificate  ☒  Graduate Certificate  ☐

2. What is the nature/purpose of the proposed certificate?

   The first and main purpose for this undergraduate certificate is to better prepare society by producing more trained computer scientists, software engineers, programmers, and other computing professionals at the pre-baccalaureate level. This certificate gives the pre-

Program Forms: New Certificate Form (Last Revised 05/2017)
baccalaureate student in-depth, hands-on experience in the theory and application of network services. The format of this certificate allows for the accumulation of a specific set of courses to constitute a degree of content mastery and provide an area of academic specialization. This certificate provides an adjunct area of study to the student’s internship or applied experience. With the ubiquitous presence of websites, mobile apps, and mission-critical data management systems, we need people prepared on every level: pre-baccalaureate, baccalaureate, master’s and doctoral level.

3. **Provide a justification for the certificate program, including the potential benefits to students and potential workforce demand for those who graduate with the credential.**

Computer networking is a fundamental tool in today’s world, and serves as a medium of communication, business, entertainment and sharing information and resources between thousands of users. Business and government agencies around the world save millions of dollars and a considerable amount of time by having their offices and personnel across the world linked through networks. Professionals in the field of networking are responsible for designing and maintaining networks. They are also responsible for implementing security measures that deter hackers, protecting information on the network, and troubleshooting. Through the computer network services certificate program, students learn the fundamental aspects of troubleshooting, networking, and network security. With the emergence of the internet of things and the many devices hooked to the internet, there is a need for professionals who can manage and troubleshoot digital networks. In addition, this certificate accomplishes at least five important tasks: (a) helps create lifelong learners. As the workforce expects an increasingly diverse and changing set of skills, students are going back to school to upgrade their credentials; (b) creates educational success; some estimates suggest one third of the people who get a certificate will go on to get a two- or four-year degree, while others will get a certificate after they get a two- or four-year degree; (c) aligns DSU curriculum to workforce needs by producing graduates with tangible, workforce-ready skill sets; and (d) allows DSU to meet its mission as a leader in the computer and cyber sciences.

Employment of network administrators in the computer systems design and related services industry is projected to grow 20 percent nationally from 2016 to 2026. The increasing adoption of cloud services by small and medium-sized businesses that do not have their own dedicated IT departments could increase the demand for network and computer systems administrators within this industry. Growth also is expected as the use of IT in healthcare increases.²

The median annual wage for network and computer systems administrators with a bachelor’s degree was $79,700 in May 2016.³ According to the SDBOR Occupational Wages Dashboard, Network and Computer Systems Administrators in South Dakota had an average annual salary of $61,570.⁴ The SDBOR Employment Projections Dashboard shows a base year employment

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1. For workforce related information, please provide data and examples; data sources may include but are not limited to the South Dakota Department of Labor, the US Bureau of Labor Statistics, Regental system dashboards, etc.
for Computer User Support Specialist (certificate or similar) of 1,690 and projected employment of 1,870 for an 11% change. The average annual openings for this position is 40.6

4. **Who is the intended audience for the certificate program (including but not limited to the majors/degree programs from which students are expected)?**

There are two intended audiences: (a) learners poised to graduate from high school who do not see college or other education as an immediate option; and (b) older learners who seek workforce entry or advantage after being out of the educational environment for a period of time.

5. **List the courses required for completion of the certificate in the table below (if any new courses are proposed for the certificate, please attach the new course requests to this form):**²

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Number</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>New (yes, no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC</td>
<td>150</td>
<td>Computer Science I</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>CSC</td>
<td>328</td>
<td>Operating Environments</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>CSC</td>
<td>383</td>
<td>Networking I</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>CSC</td>
<td>385</td>
<td>Networking II</td>
<td>3</td>
<td>No</td>
</tr>
</tbody>
</table>

Subtotal: 12.0

6. **Student Outcome and Demonstration of Individual Achievement.³**

**A. What specific knowledge and competencies, including technology competencies, will all students demonstrate before graduation?** *The knowledge and competencies should be specific to the program and not routinely expected of all university graduates.*

Competencies and intended outcomes from this certificate include: (a) developing skills in specific topics including sequence, selection, repetition, functions, and arrays; (b) resolving IT system problems to meet the needs of users by applying troubleshooting methods; (c) understanding LAN topologies, media choices, protocols and transmission techniques; and (d) learning technical networking essentials in the development, maintenance, and use of e-commerce sites.

**B. Complete Appendix A – Outcomes using the system form. Outcomes discussed below should be the same as those in Appendix A.**

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² Regental system certificate programs typically are a subset of the curriculum offered in degree programs, include existing courses, and involve 9-12 credits for completion. Deviations from these guidelines require justification and approval.
³ Board Policy 2:23 requires certificate programs to “have specifically defined student learning outcomes.”
⁴ https://www.sdbor.edu/dashboard/Pages/Occupational%20Wages.aspx – Do not use IE as browser (Show occupations by specific occupation, then Network & Computer Systems Administrators)
⁵ https://www.sdbor.edu/dashboard/Pages/Employment-Projections-Dashboard.aspx - Do not use IE as browser.
⁶ (Show Bars as: Occupations; then Occupational Category Filter as Computer, Mathematical; then choose South Dakota; Data is for Computer User Support Spec.)

Program Forms: New Certificate Form (Last Revised 05/2017)
Graduates of this program are expected to achieve these learning outcomes:

- Develop skills in problem solving, algorithm development, design, and programming concepts;
- Understand the role of the operating system in computer operations;
- Understand LAN planning, installation, and problem determination procedures;
- Understand the technical networking essentials of the development, maintenance and use of e-commerce sites.

7. Delivery Location.⁴

A. Complete the following charts to indicate if the university seeks authorization to deliver the entire program on campus, at any off-campus location (e.g., UC Sioux Falls, Capital University Center, Black Hills State University-Rapid City, etc.) or deliver the entire program through distance technology (e.g., as an on-line program)?

<table>
<thead>
<tr>
<th>Intended Start Date</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>On campus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intended Start Date</th>
<th>Yes/No</th>
<th>If Yes, list location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off campus</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>University Center, Sioux Falls</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intended Start Date</th>
<th>Yes/No</th>
<th>If Yes, identify delivery methods</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(online/other distance delivery methods)</td>
<td>Yes</td>
<td>Online</td>
<td>Fall 2018</td>
</tr>
</tbody>
</table>

B. Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the certificate through distance learning (e.g., as an on-line program)?⁵

<table>
<thead>
<tr>
<th>Intended Start Date</th>
<th>Yes/No</th>
<th>If Yes, identify delivery methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(online/other distance delivery methods)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Additional Information: Additional information is optional. Use this space to provide pertinent information not requested above. Limit the number and length of additional attachments. Identify all attachments with capital letters. Letters of support are not necessary and are rarely included with Board materials. The University may include responses to questions from the Board or the Executive Director as appendices to the original proposal where applicable. Delete this item if not used.

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⁴ The accreditation requirements of the Higher Learning Commission (HLC) require Board approval for a university to offer programs off-campus and through distance delivery.

⁵ Delivery methods are defined in AAC Guideline 5.5.

⁶ This question responds to HLC definitions for distance delivery.
Courses in this certificate program meet either core or elective requirements into the Network & Security Administration (A.S. & B.S.) degrees as well as the B.S. in Computer Science and Cyber Operations.

Appendix A

Individual Student Outcomes and Program Courses

List specific individual student outcomes—knowledge and competencies—in each row. Label each column with a course prefix and number. Indicate required courses with an asterisk (*). Indicate with an X the courses that will provide the student with an opportunity to acquire the knowledge or competency listed in the row. All students should acquire the program knowledge and competencies regardless of the electives selected. Modify the table as necessary to provide the requested information for the proposed program.

<table>
<thead>
<tr>
<th>Individual Student Outcome</th>
<th>Prefix &amp; Number</th>
<th>Prefix &amp; Number</th>
<th>Prefix &amp; Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop skills in problem solving, algorithm development, design, and programming concepts</td>
<td>CSC 150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understand the role of the operating system in computer operations</td>
<td>CSC 328</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understand LAN planning, installation, and problem determination procedures</td>
<td>CSC 383</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understand the technical networking essentials of the development, maintenance and use of e-commerce sites.</td>
<td>CSC385</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Expand the table as necessary to include all student outcomes. Outcomes in this table are to be the same ones identified in the text.