SOUTH DAKOTA BOARD OF REGENTS

Academic and Student Affairs
Consent

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

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

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>Cybersecurity</td>
</tr>
<tr>
<td>INTENDED DATE OF IMPLEMENTATION:</td>
<td>Fall 2018</td>
</tr>
<tr>
<td>PROPOSED CIP CODE:</td>
<td>11.1003 Computer &amp; Info Systems Security/Information Assurance</td>
</tr>
<tr>
<td>UNIVERSITY DEPARTMENT:</td>
<td>Beacom College of Computer &amp; Cyber Sciences</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 purpose for this undergraduate certificate is to prepare trained computer scientists, software engineers, programmers, and other computing professionals at the pre-baccalaureate level. This certificate gives the pre-baccalaureate student in-depth, hands-on experience in the  

Program Forms: New Certificate Form (Last Revised 05/2017)
theory and application of cybersecurity. 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. With the ubiquitous presence of websites, mobile apps, and mission-critical data management systems, more people need to be prepared in cybersecurity 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.**

Given the rapidly expanding internet of things and the plethora of devices hooked to the internet, with this credential learners will develop strategic knowledge of security models, risk assessment, secure systems development, crisis management, and legal, regulatory, and compliance issues. Students also gain tactical knowledge by examining access control, encryption, network security, and social engineering. This certificate assists in accomplishing the following 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, and some will get a certificate after they get a two- or four-year degree; (c) aligns DSU curriculum to workforce needs 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.

According to the Bureau of Labor Statistics, the rate of growth for jobs in information security is projected at 37% nationally from 2012-2022 which is much faster than the average for all other occupations. For many professionals currently in the cybersecurity field, they learned the necessary skills through certificate programs and in-the-field training versus degree programs. “They didn’t always teach security in college,” explained Dave Lemaire, Senior Director of Technical Operations at Dyn.

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: (1) learners poised to graduate from high school who do not see college or other education as an immediate option; and (2) older learners who seek workforce entry or advantage after being out of the educational environment for a while.

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):**

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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.


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.

*Program Forms: New Certificate Form (Last Revised 05/2017)*
<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>234</td>
<td>Software Security</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>CSC</td>
<td>245</td>
<td>Information Security Fundamentals</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>CSC</td>
<td>250</td>
<td>Computer Science II</td>
<td>3</td>
<td>No</td>
</tr>
</tbody>
</table>

Subtotal 12.0

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

   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 developing skills and principles in: (a) problem solving, algorithm development, design, and programming concepts; (b) sequence, selection, repetition, functions, and arrays; (c) attack methodologies and techniques that lead to software vulnerabilities; (d) information assurance, with emphasis on current threats and vulnerabilities; and (e) information security plans to mitigate risk.

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

   Graduates of this program are expected to achieve these learning outcomes:
   - Acquire a working knowledge of information security and assurance issues and develop an understanding of security policies, models, and mechanisms for confidentiality, integrity, and availability;
   - Understand compiled and web-based software to illustrate attack methodologies and techniques that lead to software vulnerabilities that violate fundamental security principles;
   - Develop skills in problem solving, algorithm development, design, and programming concepts;

7. **Delivery Location.**

   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>On campus</th>
<th>Yes/No</th>
<th>Intended Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Fall 2018</td>
</tr>
</tbody>
</table>

   | Yes/No | If Yes, list location(s) | Intended Start Date |

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3 Board Policy 2:23 requires certificate programs to “have specifically defined student learning outcomes.”

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.

*Program Forms: New Certificate Form (Last Revised 05/2017)*
<table>
<thead>
<tr>
<th>Off campus</th>
<th>Yes</th>
<th>University Center, Sioux Falls</th>
<th>Fall 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance Delivery</strong>&lt;br&gt;(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)?

<table>
<thead>
<tr>
<th>Yes/No</th>
<th>If Yes, identify delivery methods</th>
<th>Intended Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance Delivery</strong>&lt;br&gt;(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.

Courses in this certificate program meet either core or elective requirements into the A.S. in Network & Security Administration and Cybersecurity & Intelligence DSU is proposing as well as the B.S. in Computer Science, Cyber Operations, and Network & Security Administration.

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5 Delivery methods are defined in AAC Guideline 5.5.

6 This question responds to HLC definitions for distance delivery.
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>Program Courses that Address the Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquire a working knowledge of information security and assurance issues and develop an understanding of security policies, models, and mechanisms for confidentiality, integrity, and availability</td>
<td>CSC 245</td>
</tr>
<tr>
<td>Understand compiled and web-based software to illustrate attack methodologies and techniques that lead to software vulnerabilities which violate fundamental security principles</td>
<td>CSC 234</td>
</tr>
<tr>
<td>Develop skills in problem solving, algorithm development, design, and programming concepts</td>
<td>CSC 150, CSC 250</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.