

**SOUTH DAKOTA BOARD OF REGENTS**

**Academic and Student Affairs**

**AGENDA ITEM: 6 – H**

**DATE: May 8-10, 2018**

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**SUBJECT**

**New Program: DSU BS in Cyber Leadership and Intelligence**

**CONTROLLING STATUTE, RULE, OR POLICY**

[BOR Policy 2:23](#) – Program and Curriculum Approval

**BACKGROUND / DISCUSSION**

Dakota State University (DSU) requests authorization to offer a Bachelor of Science (BS) degree in Cyber Leadership and Intelligence. The Board approved the intent to plan at the March 2018 meeting. The interdisciplinary program will provide students with knowledge of cyber systems and world cultures, international politics, human behavior, and leadership. Graduates will assist government leaders, corporation executives, states, and localities in developing anticipatory strategies to defend organizations from cyber disruption by various kinds of criminals, non-state actors, or nations. DSU notes the Bureau of Labor Statistics forecasts an increased need of 28,400 more professionals in cyber related fields by 2026

DSU intends to offer the program both on campus and online.

**IMPACT AND RECOMMENDATION**

No related programs currently exist in the Regental system. DSU has existing related degree programs in Cyber Operations and Network and Security Administration. DSU expects to enroll over 100 students in the program after full implementation. DSU is not asking for new state resources to offer the program.

**ATTACHMENTS**

Attachment I – New Program Request Form: DSU – BS in Cyber Leadership and Intelligence

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**DRAFT MOTION 20180508\_6-H:**

I move to approve DSU's new program proposal for a BS in Cyber Leadership & Intelligence and online delivery of the program.



## SOUTH DAKOTA BOARD OF REGENTS ACADEMIC AFFAIRS FORMS

### New Undergraduate Degree Program

Use this form to propose a new undergraduate degree program. An undergraduate degree program includes a new major, a new degree, or both. 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 Undergraduate Degree Program Form to the university website for review by other universities after approval by the Executive Director and Chief Academic Officer.

<b>UNIVERSITY:</b>	DSU
<b>MAJOR:</b>	Cyber Leadership and Intelligence
<b>EXISTING OR NEW MAJOR(S):</b>	New
<b>DEGREE:</b>	
<b>EXISTING OR NEW DEGREE(S):</b>	Bachelor of Science
<b>INTENDED DATE OF IMPLEMENTATION:</b>	Fall 2018
<b>PROPOSED CIP CODE:</b>	29.0202
<b>SPECIALIZATIONS:<sup>1</sup></b>	Digital Forensics / World Affairs and Human Behavior
<b>IS A SPECIALIZATION REQUIRED (Y/N)?</b>	Yes
<b>DATE OF INTENT TO PLAN APPROVAL:</b>	3/29/2018
<b>UNIVERSITY DEPARTMENT:</b>	College of Arts and Sciences & Beacom College of Computer and Cyber Sciences
<b>UNIVERSITY DIVISION:</b>	

#### 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.*

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

4/3/2018

\_\_\_\_\_  
Date

#### 1. What is the nature/purpose of the proposed program?

The interdisciplinary Cyber Leadership and Intelligence program will provide students with knowledge of cyber systems, world cultures, international politics, human behavior, and

<sup>1</sup> If the proposed new program includes specific specializations within it, complete and submit a New Specialization Form for each proposed specialization and attach it to this form. Since specializations appear on transcripts, they require Board of Regents approval.

leadership. Graduates will assist government leaders, corporation executives, states, and localities in developing anticipatory strategies to defend organizations from cyber disruption by various kinds of criminals, non-state actors, or nations.

Dakota State's current cyber degrees include a mix of programs with an applied focus on different aspects of cyber security. This new program intends to fill a need seen in the profession regarding professional leadership and a growing demand for the attribution of who has conducted any given cyber-attack. To begin to think about attribution in a more comprehensive way, we are now seeking to offer a degree that offers curriculum in computer forensics while also teaching courses about human and criminal behavior, international politics, world cultures and various forms and meanings of communication. Such courses are needed in order to assess motives for cyber-attacks.

The University does not request new state resources. New courses will be developed and taught with existing faculty who, due to cancelling a low enrolled program and changes in general education requirements for humanities and social sciences, now have capacity to offer these courses.

**2. How does the proposed program relate to the university's mission and strategic plan, and to the current Board of Regents Strategic Plan 2014-2020?<sup>2</sup>**

Dakota State University's mission is to provide programs promoting the knowledge and understanding of information systems and education degrees. As our current institutional adopted mission statement reads, "DSU provides learning that integrates technology and innovation to develop graduates ready to contribute to local, national, and global prosperity." This degree is in direct support of this mission.

We believe this program will bring new students, particularly online students, to DSU due to increasing demand and market notice we have seen from active duty military. Many students in our current Cyber Operations or Network Security programs have noted that this degree program sounds appealing as it is offering topics directly relevant to computer security and forensics investigations but are not currently offered. Particularly appealing is that they will be offered within a comprehensive degree program with an introductory course, an internship, and a capstone course focused on issues of leadership of cyber security organizations with a focus on human behavior in a global environment. We see that the leadership component will also be attractive to students. Every corporation and government enterprise is concerned about their networks' security and integrity, so a wide variety of organizations will be interested in these graduates. For example, Air Force ROTC Detachment Commander at SDSU, Lt Col Brian K. Schoeder, who is working to increase his student population across multiple campuses in South Dakota, agrees this program will be something the Air Force will be very interested in seeing come about. Also, the current CIO of East River Electric is supportive of the degree program and will be on its Advisory Board. Other members of the emerging board include a retired Army Lieutenant General and former CIO of the US Army, the former Deputy Director of the Defense

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<sup>2</sup> South Dakota statutes regarding university mission are located in SDCL 13-57 through 13-60; Board of Regents policies regarding university mission are located in Board Policies 1:10:1 through 1:10:6. The Strategic Plan 2014-2020 is available from [https://www.sdbor.edu/the-board/agendaitems/Documents/2014/October/16\\_BOR1014.pdf](https://www.sdbor.edu/the-board/agendaitems/Documents/2014/October/16_BOR1014.pdf).

Intelligence Agency, a former Counter-Terrorism director on the National Security Council, and a current all-source analyst at the Defense Intelligence Agency. With such experts supporting this effort, nested with related degree programs on campus, and with the coming construction of the Madison Cyber Labs (MadLabs), we see this degree program as a natural extension of our current offerings and an important and necessary addition for our future students.

SDCL 13-59-2.2 identifies the primary mission of DSU as providing “instruction in computer management, computer information systems, electronic data processing, and other related undergraduate and graduate programs.” In addition, Board of Regents Policy 1:10:5 authorizes DSU to offer “undergraduate and graduate programs that are technology-infused and promote excellence in teaching and learning. These programs support research, scholarly and creative activities and provide service to the State of South Dakota and the region.”

The proposed program also addresses several aspects of the Board of Regents Strategic Plan 2014-2020, including but not limited to:

Goal 1: Student Success (Growing the number of undergraduate degrees awarded; Improving retention and graduation rates by providing academic programs in demand by students and employers).

Goal 2: Academic Quality and Performance (Increasing the number of students participating in experiential learning).

Goal 3: Research and Economic Development (Increasing the number of graduates from STEM Programs).

3. **Describe the workforce demand for graduates of the program, including national demand and demand within South Dakota.** *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.*

We’ve seen a greater need to provide students an ability to attribute cyber-attacks. Doing so requires an understanding of foreign cultures, global trade, governmental security organizations, US foreign policy, and the nature of international organizations. The US government, the 50 state governments, large and medium size corporations, the military, including the National Guard and Reserve, all demand people educated with this type of degree. The national job outlook for Information Security Analysts is very strong. The Bureau of Labor Statistics forecasts an increased need of 28,400 more professionals in the United States by 2026. The primary purpose for introducing this program is workforce development as the United States anticipates dramatic workforce demand in cyber security professionals. Information Security Analysts who analyze threat data and write

report/communicate results have a median pay of \$92,600 per year.<sup>3</sup> In South Dakota, the current number of positions is 210 and growing with an average wage of \$79,000 - \$88,000.<sup>4</sup>

Furthermore, we anticipate graduates of this program taking positions outside of strictly information security work as these kinds of people are becoming necessary in an increasing number of fields and industries. The global economy is now experiencing what the World Economic Forum refers to as the 4<sup>th</sup> Industrial Revolution.<sup>5</sup> They are noting the changing economy and society due to an increasing use of Artificial Intelligence, Machine Learning, 3D printing, Cloud and Block Chain computing, 5G, Big Data, Virtual Reality, nanotechnology and robotics and the synergies that result will continue to radically alter the economy and the nature of work. One of these implications is that more and more companies in various industries own less and less of the capital traditionally thought of as key to being in that industry. As examples, Facebook, one of the world's largest advertisers, creates and owns no content. One of the largest real estate companies, Airbnb, owns no property. The largest transportation service, Uber, owns no vehicles and employs no drivers, and the world's largest retailer Alibaba owns no inventory.<sup>6</sup> When Instagram was sold for \$1 Billion, it employed 13 people and owned nothing but a small amount of office space, servers, and photo editing software.<sup>7</sup> These are just some examples of how traditional industries are becoming something else entirely. Whatever shape this takes, more and more companies in more and more sectors and industries will rely on graduates of programs such as this, to not only defend their networks, but imagine and lead their company forward. The Cyber Leadership and Intelligence graduates will be strong communicators, able to lead small teams of colleagues, within an ever wider set of organizations concerned about the security of their networks from finance, to health care, to media, and agriculture.

South Dakota currently does not produce cyber security graduates of this nature. This kind of degree is far less strictly defensive or offensive in nature, as it will assist government leaders, corporation executives, states and localities by developing anticipatory strategies and focus on likely sources of attacks. Graduates are necessary to fill jobs at the federal, state, local and corporate levels: Federal – On the federal level, the government's law enforcement, military, and intelligence departments are the source of the guidelines which oversee our country's various cyber security operations at both state and local levels. Employees work throughout the country and around the world for the Department of Defense at military bases and the agencies under its authority, including:

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<sup>3</sup> Bureau of Labor Statistics, US Department of Labor, Occupational Outlook Handbook, Information Security Analysts, on the Internet at <https://www.bls.gov/ooh/computer-and-information-technology/information-securityanalysts.htm> (visited November 28, 2017).

<sup>4</sup> Projections Central – State Occupational Projections, Short Term Occupational Projections, South Dakota, Information Security Analysts, on the Internet at <http://www.projectionscentral.com/Projections/ShortTerm> (visited January 23, 2018).

<sup>5</sup> Video Recording of WEF Session, Sept 18, 2017. [https://www.youtube.com/watch?v=KWT53BHd\\_Cw](https://www.youtube.com/watch?v=KWT53BHd_Cw) (Accessed April 2, 2018)

<sup>6</sup> <https://www.rt.com/business/338621-alibaba-overtakes-walmart-volume/> (Accessed April 2, 2018)

<sup>7</sup> Daily Mail Online, "Instagram's 13 employees share \$100m as CEO set to make \$400 m reveals he once turned down a job at Facebook," Daily Mail Online, Apr 9, 2012. <http://www.dailymail.co.uk/news/article-2127343/Facebook-buys-Instagram-13-employees-share-100m-CEO-Kevin-Systrom-set-make-400m.html> (Accessed April 2, 2018)

- US Cyber Command, and the subordinate armed services Cyber commands
- U.S. Customs and Border Protection
- U.S. Citizenship and Immigration Services
- U.S. Immigration and Customs Enforcement
- Homeland Security
- Transportation Security Administration

Working for these agencies often requires a security clearance, which can typically only be obtained by U.S. citizens who meet specific guidelines.

Employment outlook State – At the state level, information technology, homeland security and law enforcement agents, financial services, and related fields where such graduates could find work are expected to increase. The U. S. Department of Labor estimates an increased need of Computer System Analysts of 2.4% and of Information Security Analysts of 10.3% in South Dakota by 2026.<sup>8</sup> Furthermore, as these graduates’ careers develop, we see them becoming Computer and Information Systems Managers, a career field that in South Dakota is predicted to have an increasing demand of 5.4% and a wage of \$126,840.<sup>9</sup>

Employment outlook National – The U.S. Department of Labor estimates a national need increasing to 96,500 Management Analysts, Information Security Analysts by 28,400; and 43,800 more Computer & Information Systems managers by 2026 are predicted. The overall category of “computer and mathematical occupations” is projected to grow nationally by 13.5%.<sup>10</sup>

In our informal conversations from students and prospective students on campus, we have seen an interest in this degree from students looking for forensics, analytics, cyber operations, network security, and some from criminal justice. The Leadership, World Affairs, and Human Behavior curriculum is attractive to them as something that rounds out their knowledge. Potential employers see that curriculum as attractive as well.

#### **4. How will the proposed program benefit students?**

Adding a BS program in Cyber Leadership and Intelligence will provide an opportunity for either aspiring business, law enforcement, or technology professionals to augment their skills for computer forensics, anticipate the national, state, and local demand for infrastructure protection, and to understand who and why cyber-attacks are happening in order to more effectively counter them. It deals with a real threat in our modern, knowledge-based

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<sup>8</sup> Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Information Security Analysts, on the Internet at: [https://www.bls.gov/oes/current/oes\\_sd.htm#15-0000](https://www.bls.gov/oes/current/oes_sd.htm#15-0000) (visited November 28, 2017).

<sup>9</sup> Bureau of Labor Statistics, U. S. Department of Labor, Occupational Outlook Handbook, Occupational Employment and Wages, May 2016. Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Information Security Analysts, on the Internet (visited November 28, 2017)

<sup>10</sup> Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Information Security Analysts, on the Internet at <https://www.bls.gov/oes/current/oes151122.htm> (visited November 28, 2017).

economy and serves as another program which integrates technology across multiple disciplines.

Furthermore, students will begin to develop leadership and vital communication skills and talents for this critical and emerging profession that will be put to immediate use in a wide variety of professions and industries. The need for leadership and management related degrees in South Dakota is strong. Since FY 2011, management degrees currently in the SD BOR system tend to do well in a wide variety of industry placement and salaries. Looking at the undergraduate placement rates in the degree programs, Business, Business Administration, Business Management, Industrial Management, and Management Information Systems show an in-state placement rate of 59% - 69% and a salary range of \$31,772 - \$45,651 per year.<sup>11</sup> We would anticipate this program's demand to be higher than traditional management degrees due to the knowledge students will have regarding technical security matters. In short, this program will provide students strong career options in many professions, as they will be conversant in the information system security tools necessary for a wide variety of jobs and industries that nevertheless have a growing requirement for technical knowledge and understanding.

### **Program Proposal Rationale:**

#### **A. If a new degree is proposed, what is the rationale?<sup>12</sup>**

Not Applicable

#### **B. What is the rationale for the curriculum?**

A faculty committee has been discussing this concept for several months and meeting more formally over the past several weeks to think through the appropriate curriculum. The committee took into account their own thinking and experience (some of whom hold, or held, US Government security clearances and have industry and military experience) of what the future holds for our current Cyber Operations, Network Security, and Computer Forensics professionals. We saw a definite need to develop a curriculum that thought more broadly about the profession regarding ethics, leadership, writing and oral communication. We also saw a clear need to provide students an opportunity to learn more about international diplomacy, foreign cultures, criminal behavior, and warfare. The curriculum below reflects their thinking on the courses that DSU can offer and develop to meet those needs.

#### **C. Demonstrate/provide evidence that the curriculum is consistent with current national standards. Complete the tables below and explain any unusual aspects of the proposed curriculum?**

DSU is breaking new ground with this program and there is no US accreditation

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<sup>11</sup> South Dakota Board of Regents, Graduate Placement Dashboard.  
<https://www.sdbor.edu/dashboards/Pages/GraduatePlacement.aspx> (visited December 22, 2017.)

<sup>12</sup> This question refers to the type of degree, not the program. For example, if your university has authorization to offer the Bachelor of Science and the program requested is a Bachelor of Science, then the request is not for a new degree.



n for this degree, nor are their BS level curriculum done widely around the country. The career field is constantly shifting and in many ways still emerging. Our students will leave DSU and establish many of the best practices for their profession as it matures in the coming years. For instance, there is no current professional ethics, such as bioethics for health-care professionals. We plan to establish a course on Cyber-Ethics and have already, started that conversation on campus, in the state, and nationally with classes, interviews on SD Public Broadcasting, and columns in the local and national media. The Digital Forensics faculty have leveraged their considerable experience in industry and law enforcement consulting, to include and update our current curriculum from other programs on campus for this curriculum. Administration and faculty with military experience, sought to include foreign policy, military history, and world literature courses due to the vital need for cultural understanding to inform the profession and they have modeled, as much as possible, the curriculum on various strategic studies programs around the world. The popular “Hackers, Hacking, and Hacktivism,” course previously taught as a special topics course, was a natural for this program. Human behavior with a focus on various kinds of criminal activity and world cultures, economics, geography, and religion, all key in what defines a culture. The college Deans will develop the leadership courses, and the polysci faculty member will teach the international relations courses. While there are several disciplines in the curriculum, and we are creating a new prefix, the program meets our goal of providing students a framework to understand cyber/digital forensics work, world affairs, and human behavior necessary for a sophisticated understanding of attributing cyber-attacks back to their origin.

**D. Summary of the degree program (complete the following tables):**

<b>[Insert title of proposed program]</b>	<b>Credit Hours</b>	<b>Credit Hours</b>	<b>Percent</b>
System General Education Requirements	30		
Subtotal, Degree Requirements		30	25%
Required Support Courses (not included above)	0		
Major Requirements	54		
Major Electives	18		
Subtotal, Program Requirements		72	60%
Free Electives	18	18	15%
Degree Total <sup>13</sup>		120	100%

<sup>13</sup> Board Policy 2:29 requires each baccalaureate level degree program to require 120 credit hours and each associate degree program to require 60 credit hours. Exceptions to this policy require documentation that programs must comply with specific standards established by external accreditation, licensure, or regulatory bodies or for other compelling reasons and must receive approval by the Executive Director in consultation the President of the Board of Regents.



**Required Support Courses Outside the Major***(Not general education or institutional graduation requirements)*

<b>Prefix</b>	<b>Number</b>	<b>Course Title</b> <i>(add or delete rows as needed)</i>	<b>Credit Hours</b>	<b>New (yes, no)</b>
		NONE		Choose an item.
Subtotal			0	

**Major Requirements**

Two circumstances have come about creating capacity in some of our social science and humanities faculty. The first was the deletion of our previous Professional and Technical Communications major due to low enrollment. We converted the position to a Philosopher (Research appointment) in order to teach 4 courses a year and do grant research and outreach on cyber-ethics. This change provided us the opportunity to offer general education ethics and logic courses and to offer one section per year on cyber ethics, which is one of the 11 courses. Dakota State also changed the courses that would satisfy requirements social science general education requirements for Elementary Education majors last year and we expect in the coming year to see less demand for US History I and II, American Government, Social Problems, and Human Geography as no programs now require these courses. Many students may choose these courses as social science electives to fulfill this general education requirement, and offer them less frequently. We anticipate the two less HIST 151/152 sections, two less SOC general education sections, and one less Geography section per year. Additionally, the Deans of the two colleges affiliated with this program will develop and teach the CLI 420 Cyber Leadership Course. The CLI 310 course had been offered previously as an English Special Topics course and with this program we will put it in an annual rotation. The new faculty member, with a graduate degree in International Relations or National Security Affairs will teach the CLI 101 course, the two upper division Intelligence courses we are adding, the CLI Seminar, and manage the Internships. This faculty member will teach five of the 11 courses offered on a rotational basis each year. The Beacom/Sanford gift drives this faculty line that is in keeping and will augment all of the intelligence rich degree programs at DSU and supports the salary cost until the program grows to sustain the increased salary expense.

<b>Prefix</b>	<b>Number</b>	<b>Course Title</b> <i>(add or delete rows as needed)</i>	<b>Credit Hours</b>	<b>New (yes, no)</b>
CLI	101	Introduction to Cyber Leadership	3	Yes
CSC	105	Introduction to Computers	3	No
CIS or CSC	123 or 150	Problem Solving and Programming or Computer Science I	3	No
CSC	145	Cyber Security Fundamentals	3	No
CIS or CSC	275 or 250	Web Application Programming I or Computer Science II	3	No
CIS	321	Information Security Management	3	No
CSC	363	Hardware, Virtualization, and Data Communication	3	No
ENGL	212	World Literature II	3	No
GEOG	353	Geography of Religion	3	Yes
POLS	350	International Relations	3	Yes

SOC	370	People and their Cultures	3	Yes
HIST	256	World History	3	No
CLI	370	Cyber-Ethics	3	Yes
BADM or SPCM	360 or 410	Organization and Management or Organizational Communication	3	No
CLI	420	Cyber Leadership	3	Yes
HIST	488	Introduction to Grand Strategy	3	No
CLI	492	Topics	3	Yes
CLI	494	Internship	1-3	Yes
Subtotal			54	

GEOG 353, POLS 350, SOC 370, are common system courses DSU will be asking for authority to offer. CLI 101, CLI 370, CLI 420, CLI 491, CLI 492, CLI 494 are courses DSU will develop.

**Digital Forensics Specialization Major Electives: List courses available as electives in the program. Indicate any proposed new courses added specifically for the major.**

Prefix	Number	Course Title (add or delete rows as needed)	Credit Hours	New (yes, no)
CSC	328	Operating Environments	3	No
CSC	383	Networking I	3	No
CSC	385	Networking II	3	No
CSC	388	Computer Forensics Fundamentals	3	No
CIS	418	Advanced Computer Forensics	3	No
CIS	419	Advanced Windows Forensics	3	No
Subtotal			18	

**World Affairs and Human Behavior Specialization Major Electives: List courses available as electives in the program. Indicate any proposed new courses added specifically for the major.**

Prefix	Number	Course Title (add or delete rows as needed)	Credit Hours	New (yes, no)
ENGL	379	Technical Communications	3	No
CLI	310	Hacking, Hackers, and Hacktivism	3	Yes
SOC	402	Social Deviance	3	Yes
HIST	470	History of World War II	3	No
POLS	440	Comparative Government	3	Yes
ECON	202	Principles of Macroeconomics	3	No
Subtotal			18	

CLI 310 is a new course DSU will develop, and has offered before as an ENGL special topics. SOC 402, POLS 440 are courses DSU is requesting authority to offer.

## 5. Student Outcomes 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. **Complete Appendix A – Outcomes using the system form.** Outcomes discussed below should be the same as those in Appendix A. The knowledge and competencies specific to the program must relate to the proposed assessments in B and C below.*

See next page.

**B. Are national instruments (i.e., examinations) available to measure individual student achievement in this field? If so, list them.**

None.

**C. How will individual students demonstrate mastery? Describe the specific examinations and/or processes used, including any external measures.<sup>14</sup> What are the consequences for students who do not demonstrate mastery?** The program requires an internship, and while assessment will be done along the way in communications, problem solving and programming skills and knowledge, among other things, we see the internship as a critical feedback for the faculty on how well we are preparing students. Furthermore, we are putting together an advisory board of experienced professionals from this field and will ask them, as appropriate, to provide feedback on their student interaction, the student research seminar topics and results, and advice to faculty.

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<sup>14</sup> What national examination, externally evaluated portfolio or student activity, etc., will verify that individuals have attained a high level of competence and identify those who need additional work?

STUDENT OUTCOME / COURSE	CLI 101	CSC 105	CIS 123	CSC 150	CSC 245
Demonstrate a working knowledge of common operating systems including installation, configuration, scripting, user and resource management, troubleshooting, and the use of common system utilities		X	X	X	X
Work effectively as a member of a team and gain experience leading small teams to be ready for entry level management positions in businesses and government	X				
Demonstrate effective oral and written communication	x				
Demonstrate problem solving and critical thinking skills	X	X	X	x	x
Appreciate and understand an investigation of a security breach and what will be involved in detecting cyber intrusions (basic investigative techniques, computer forensics, evidence collection and preservation, legal issues, and personal privacy issues)	x		X		x
Demonstrate an understanding of how nation states have in the past and currently do conduct their trade, diplomacy, and wars	x				
Demonstrate an understanding of non-nation state groups and how they achieve their aims	x				
Understand the ethical issues at play relating to cyber attacks including: privacy, intellectual property, and the laws of war	X				
Demonstrate knowledge of major religions, literary traditions, geography, history, and values.					
For the Digital Forensics Specialization: Demonstrate knowledge of how networks are defended and attribution of cyber attacks may be determined	X				
For the students in the World Affairs and Human Behavior Specialization: Demonstrate knowledge of how nations, non-nation state groups, and criminals seek to achieve their aims.	x				

STUDENT OUTCOME / COURSE	CSC 250	CIS 321	CSC 363	ENGL 212	GEOG 353	POLS 350
Demonstrate a working knowledge of common operating systems including installation, configuration, scripting, user and resource management, troubleshooting, and the use of common system utilities	X					
Work effectively as a member of a team and gain experience leading small teams to be ready for entry level management positions in businesses and government						
Demonstrate effective oral and written communication				X	X	X
Demonstrate problem solving and critical thinking skills	X	X	X	X	X	X
Appreciate and understand an investigation of a security breach and what will be involved in detecting cyber intrusions (basic investigative techniques, computer forensics, evidence collection and preservation, legal issues, and personal privacy issues)	X	X	X			
Demonstrate an understanding of how nation states have in the past and currently do conduct their trade, diplomacy, and wars				X	X	X
Demonstrate an understanding of non-nation state groups and how they achieve their aims				X	X	
Understand the ethical issues at play relating to cyber attacks including: privacy, intellectual property, and the laws of war		X				
Demonstrate knowledge of major religions, literary traditions, geography, history, and values.				X	X	X
For the Digital Forensics Specialization: Demonstrate knowledge of how networks are defended and attribution of cyber attacks may be determined	X					
For the students in the World Affairs and Human Behavior Specialization: Demonstrate knowledge of how nations, non-nation state groups, and criminals seek to achieve their aims.						

STUDENT OUTCOME / COURSE	SOC 370	HIST 256	CLI 370	BADM 360 OR SPCM 410	CLI 420	HIST 488
Demonstrate a working knowledge of common operating systems including installation, configuration, scripting, user and resource management, troubleshooting, and the use of common system utilities						
Work effectively as a member of a team and gain experience leading small teams to be ready for entry level management positions in businesses and government				x	x	
Demonstrate effective oral and written communication	x	x	x		x	x
Demonstrate problem solving and critical thinking skills	x	x	x	x	x	x
Appreciate and understand an investigation of a security breach and what will be involved in detecting cyber intrusions (basic investigative techniques, computer forensics, evidence collection and preservation, legal issues, and personal privacy issues						
Demonstrate an understanding of how nation states have in the past and currently do conduct their trade, diplomacy, and wars	x	x				x
Demonstrate an understanding of non-nation state groups and how they achieve their aims	x	x	x		x	x
Understand the ethical issues at play relating to cyber attacks including: privacy, intellectual property, and the laws of war					x	x
Demonstrate knowledge of major religions, literary traditions, geography, history, and values.	x	x	x	x	x	x
For the Digital Forensics Specialization: Demonstrate knowledge of how networks are defended and attribution of cyber attacks may be determined						
For the students in the World Affairs and Human Behavior Specialization: Demonstrate knowledge of how nations, non-nation state groups, and criminals seek to achieve their aims.						

STUDENT OUTCOME / COURSE	CLI 490	CLI 494	CSC 328	CSC 383	CSC 385	CSC 388
Demonstrate a working knowledge of common operating systems including installation, configuration, scripting, user and resource management, troubleshooting, and the use of common system utilities						
Work effectively as a member of a team and gain experience leading small teams to be ready for entry level management positions in businesses and government	x	x				
Demonstrate effective oral and written communication	x	x				
Demonstrate problem solving and critical thinking skills	x	x				
Appreciate and understand an investigation of a security breach and what will be involved in detecting cyber intrusions (basic investigative techniques, computer forensics, evidence collection and preservation, legal issues, and personal privacy issues)			x	x	x	x
Demonstrate an understanding of how nation states have in the past and currently do conduct their trade, diplomacy, and wars	x	x				
Demonstrate an understanding of non-nation state groups and how they achieve their aims	x	x				
Understand the ethical issues at play relating to cyber attacks including: privacy, intellectual property, and the laws of war	x	x				
Demonstrate knowledge of major religions, literary traditions, geography, history, and values.	x	x				
For the Digital Forensics Specialization: Demonstrate knowledge of how networks are defended and attribution of cyber attacks may be determined			x	x	x	x
For the students in the World Affairs and Human Behavior Specialization: Demonstrate knowledge of how nations, non-nation state groups, and criminals seek to achieve their aims.						



STUDENT OUTCOME / COURSE	CSC 418	CSC 419	ENGL 379	CLI 310	SOC 402	HIST 488
Demonstrate a working knowledge of common operating systems including installation, configuration, scripting, user and resource management, troubleshooting, and the use of common system utilities						
Work effectively as a member of a team and gain experience leading small teams to be ready for entry level management positions in businesses and government						
Demonstrate effective oral and written communication			X	x	x	x
Demonstrate problem solving and critical thinking skills						
Appreciate and understand an investigation of a security breach and what will be involved in detecting cyber intrusions (basic investigative techniques, computer forensics, evidence collection and preservation, legal issues, and personal privacy issues)	x	x				
Demonstrate an understanding of how nation states have in the past and currently do conduct their trade, diplomacy, and wars						
Demonstrate an understanding of non-nation state groups and how they achieve their aims						
Understand the ethical issues at play relating to cyber attacks including: privacy, intellectual property, and the laws of war						
Demonstrate knowledge of major religions, literary traditions, geography, history, and values.						
For the Digital Forensics Specialization: Demonstrate knowledge of how networks are defended and attribution of cyber attacks may be determined	x	x				
For the students in the World Affairs and Human Behavior Specialization: Demonstrate knowledge of how nations, non-nation state groups, and criminals seek to achieve their aims.			X	x	x	x

STUDENT OUTCOME / COURSE	POLS 440	ECON 202
Demonstrate a working knowledge of common operating systems including installation, configuration, scripting, user and resource management, troubleshooting, and the use of common system utilities		
Work effectively as a member of a team and gain experience leading small teams to be ready for entry level management positions in businesses and government		
Demonstrate effective oral and written communication	x	X
Demonstrate problem solving and critical thinking skills		
Appreciate and understand an investigation of a security breach and what will be involved in detecting cyber intrusions (basic investigative techniques, computer forensics, evidence collection and preservation, legal issues, and personal privacy issues		
Demonstrate an understanding of how nation states have in the past and currently do conduct their trade, diplomacy, and wars		
Demonstrate an understanding of non-nation state groups and how they achieve their aims		
Understand the ethical issues at play relating to cyber attacks including: privacy, intellectual property, and the laws of war		
Demonstrate knowledge of major religions, literary traditions, geography, history, and values.		
For the Digital Forensics Specialization: Demonstrate knowledge of how networks are defended and attribution of cyber attacks may be determined		
For the students in the World Affairs and Human Behavior Specialization: Demonstrate knowledge of how nations, non-nation state groups, and criminals seek to achieve their aims.	x	X

- 6. What instructional approaches and technologies will instructors use to teach courses in the program?** *This refers to the instructional technologies and approaches used to teach courses and NOT the technology applications and approaches expected of students.*

Our students will be exposed to the latest technology in the field of digital forensics and, ultimately, the facilities and equipment in the Madison Cyber Labs, which will prove useful for their research and seminar topics as upper-class students. The non-technical courses will be taught in lecture format using visual media as instructional aids.

- 7. Did the University engage any developmental consultants to assist with the development of the curriculum?<sup>15</sup> Did the University consult any professional or accrediting associations during the development of the curriculum? What were the contributions of the consultants and associations to the development of curriculum?**

The following individuals have verbally agreed to serve on the CLI Advisory Board. We have consulted them about broad areas we plan to cover and the digital forensics focus aspect of the curriculum.

Dane R. Egli, Captain, Ph.D. USCG (Ret)

Currently: National Nuclear Security Administration

Formerly: Johns Hopkins University, Applied Physics Lab, Strategic Advisor NSC Staff, White House

Ph.D. Homeland Security, University of Colorado – Denver, CO

Author: *Beyond the Storms: Strengthening Homeland Security and Disaster Management to Achieve Resilience*, Routledge, 2014.

Patrick Engebretson, Ph.D.

Currently: Chief Information Officer, East River Electric, Madison, SD

Formerly: Associate Professor of Cyber Operations at Dakota State University

Author: *The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy*. Syngress, 2011.

Susan Lawrence, LTG US Army Retired

Currently: Managing Director, National Security Practice, Accenture Federal Services

Formerly: Chief Information Officer, US Army

William Salkind, Lt Col, USAF (Ret)

Currently: All-Source Analyst, Defense Intelligence Agency, Ft Belvoir, MD.

MA, History, American University, Washington, D.C.

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<sup>15</sup> Developmental consultants are experts in the discipline hired by the university to assist with the development of a new program (content, courses, experiences, etc.). Universities are encouraged to discuss the selection of developmental consultants with Board staff.

Mr. David R. Shedd

Formerly: Deputy Director, Defense Intelligence Agency

Formerly: staff member, NSC, White House

Formerly: member of the Clandestine Service, Central Intelligence Agency

MA, Georgetown University, Latin American Studies

- 8. Are students enrolling in the program expected to be new to the university or redirected from other existing programs at the university? Complete the table below and explain the methodology used in developing the estimates (replace “XX” in the table with the appropriate year). If question 12 includes a request for authorization for off-campus or distance delivery, add lines to the table for off-campus/distance students, credit hours, and graduates. We expect slow growth on campus with many students selecting this program as an on – campus alternative to the cyber ops program. As the word spreads among the military we expect consistent steady growth to a max of about 150 students after several years when accounting for persistence. Because we have many online programs we do expect students from other on line programs to populate both on campus and online modalities.**

	Fiscal Years*			
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
<i>Estimates</i>	FY 18	FY 19	FY 20	FY 23
Students new to the university on campus	5	5	10	10
Students new to the university online	5	10	15	20
Students from other university programs	10	10	10	10
Continuing students		18	39	67
=Total students in the program (fall)	20	43	74	107
Program credit hours (major courses) ** on campus				
Program credit hours (major courses) ** online				
Graduates on campus	0	0	0	6
Graduates online	0	0	0	6

\*Do not include current fiscal year.

\*\*This is the total number of credit hours generated by students in the program in the required or elective program courses. Use the same numbers in Appendix B – Budget.

- 9. Is program accreditation available? If so, identify the accrediting organization and explain whether accreditation is required or optional, the resources required, and the University’s plans concerning the accreditation of this program.**

Not at this time.

- 10. Does the University request any exceptions to any Board policy for this program? Explain any requests for exceptions to Board Policy. If not requesting any exceptions, enter “None.”**

None.

**11. Delivery Location<sup>16</sup>**

- 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 online program)?**

	Yes/No	Intended Start Date
<b>On campus</b>	Yes	Fall 2018

	Yes/No	If Yes, list location(s)	Intended Start Date
<b>Off campus</b>	No		Choose an item. Choose an item.

	Yes/No	If Yes, identify delivery methods <sup>17</sup>	Intended Start Date
<b>Distance Delivery (online/other distance delivery methods)</b>	Yes	Online	Fall 2019

- 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 online program)?<sup>18</sup>**

	Yes/No	If Yes, identify delivery methods	Intended Start Date
<b>Distance Delivery (online/other distance delivery methods)</b>	Choose an item.		Choose an item. Choose an item.

**12. Cost, Budget, and Resources: Explain the amount and source(s) of any one-time and continuing investments in personnel, professional development, release time, time redirected from other assignments, instructional technology & software, other operations and maintenance, facilities, etc., needed to implement the proposed major. Address off-campus or distance delivery separately. Complete Appendix B – Budget and briefly summarize to support Board staff analysis.**

The table below provides a summary. The narrative that follows discusses the revenue that the additional, new students we anticipate enrolling at Dakota State and declaring Cyber Leadership and Intelligence as a major (in other words, would not have enrolled otherwise) will generate.

<sup>16</sup> The accreditation requirements of the Higher Learning Commission (HLC) require Board approval for a university to offer programs off-campus and through distance delivery.

<sup>17</sup> Delivery methods are defined in [AAC Guideline 5.5](#).

<sup>18</sup> This question responds to HLC definitions for distance delivery.

	Development/Start-up	Long-term Operation
Reallocate existing resources (faculty members from Humanities and Social Sciences)	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

We do not anticipate needing additional faculty, external resources, new State resources, or asking the SDBOR to increase student fees for students in this major. We will have some intelligence expertise added as part of our mission specific large gifts program.

**13. Is the university requesting or intending to request permission for a new fee or to attach an existing fee to the program (place an "X" in the appropriate box)? If yes, explain.**

☐ Yes      ☒ No

*Explanation (if applicable):*

**14. New Course Approval: New courses required to implement the new undergraduate degree program may receive approval in conjunction with program approval or receive approval separately. Please check the appropriate statement:**

- ☐ YES,  
*The university is seeking approval of new courses related to the proposed program in conjunction with program approval. All New Course Request and Authority to Offer forms will be submitted after the program is approved..*
- ☒ NO,  
*the university is not seeking approval of all new courses related to the proposed program in conjunction with program approval; the institution will submit new course approval requests separately or at a later date in accordance with Academic Affairs Guidelines.*

**15. 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.*