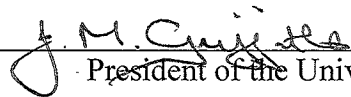


**South Dakota Board of Regents
New Undergraduate Degree Program**

University:	Dakota State University
Major:	Software Development
Existing or New Major (s):	New
Degree:	Associate of Science (A.S.)
Existing or New Degree (s):	Existing
Intended Term of Implementation	Fall 2016
Proposed CIP code:	
University Department	Department of Computing
University Division	College of Computing

University Approval

To the Board 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

April 26, 2016
Date

After approval by the President, a signed copy of the proposal should be transmitted to the Executive Director. Only after the Executive Director's review should the proposal be posted on the university web site and the Board staff and the other universities notified of the URL.

1. What are the purposes of the proposed program?

Dakota State University (DSU) requests authorization to offer an Associate of Science (A.S.) in Software Development. Software Development is an academic discipline that develops, creates and modifies general computer applications software or specialized software, from analysis of user needs, design, implementation, testing and maintenance. The Software Development major will prepare students for careers in a wide range including education, business and industry, management, social and human services, corporate and non-profit organizations.

DSU has a B.S. degree in Computer Science, Cyber Operations and Network and Security Administration. This A.S. degree will prepare graduates for entry-level work in a range of fields and/or provide transfer options to the B.S. degrees mentioned. The curriculum for this degree has been designed to allow students who complete the 60 credits of coursework to be used towards their bachelor's degree.

The University does not request new state resources. All courses are currently being offered on campus and online.

Workforce Demand for Graduates

According to results of National Association of Colleges and Employees' (NACE) Job Outlook 2016 survey, which form the basis for the Winter 2016 Salary Survey report, STEM graduates

are expected to receive the highest starting salaries. In addition, more than half of the employers responding to the Job Outlook 2016 survey noted plans to hire 2016 graduates with bachelor’s degrees in the STEM fields, making these grads among the mostly highly sought in the class. The computer sciences fields are second in terms of starting salary, with an overall average starting salary projected at \$61,321. Two of the three reported computer science disciplines also top the \$60,000 mark, while the third—information science and systems—falls just below that mark at \$59,810¹. While these salaries are for those with bachelor’s degrees, those with associate degrees should follow suit with higher starting salaries.

¹ <http://www.naceweb.org/uploadedFiles/Content/static-assets/downloads/executive-summary/2016-january-salary-survey-executive-summary.pdf>

Occupational Projections (Long-term) for Software Developers, Applications in South Dakota in 2012-2022

Occupational Projections Table

The table below shows the long term employment projections for Software Developers, Applications in South Dakota for the 2012-2022 projection period.

2012 Estimated Employment	2022 Projected Employment	Total 2012-2022 Employment Change	Annual Avg. Percent Change	Total Percent Change
720	865	145	1.85%	20.17%

Source: Labor Market Information Center, SD Dept. of Labor & Regulation
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University Mission and Priority

The statutory mission statement for Dakota State University is provided in SDCL 13-59-2.2:

The primary purpose of Dakota State University in Madison in Lake County is to provide instruction in computer management, computer information systems, electronic data processing and other related undergraduate and graduate programs. The secondary purpose is to offer two-year, one-year and short courses for application and operator training in the areas authorized by this section.

This authorization includes the preparation of elementary and secondary teachers with emphasis in computer and information processing.

Except for degree programs in existence during the 1983-1984 academic year, the unique baccalaureate programs authorized for Dakota State University shall not be duplicated by the Board of Regents.

Board Policy 1:10:5 Dakota State University Mission Statement provides the degrees authorized:

A. Undergraduate Programs: Associate degree programs are approved in allied health care, business, general studies, and information technology.

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Baccalaureate programs: allied health care, business, education, information technology, mathematics, and sciences.

B. Graduate Programs: Master's degree programs are approved in education and information technology as well as a Doctor of Science degree in Information Systems and Cyber Security.

University Priority and Strategic Plan

The most recent DSU Strategic Plan includes goals that are directly related to this program request:

- Offer innovative and robust academic programs that link to our mission.
- Infuse innovative technology in the delivery of academic programs.
- Optimize undergraduate and graduate enrollments.

The proposed degree in software development supports all of these strategic directions for DSU.

2. Rationale

A. What is the rationale for the curriculum?

The curriculum is designed to offer courses that will prepare students for a variety of entry level jobs and careers in software development for business and industry, in the public and/or private sector. This degree is designed to be a 2 + 2 for the BS in Computer Science, BS in Cyber Operations, and BS in Network and Security Administration.

B. Demonstrate that the curriculum is consistent with current national standards.
Complete the tables below and explain any unusual aspects of the proposed curriculum.

There are currently no national standards for software development.

C. If a new degree is proposed, what is the rationale?

This is not a new degree. DSU is already authorized to deliver the Associate of Science degree.

D. Summary of the Degree Program

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<i>Title of proposed program</i>	Credit Hours	Credit Hours	Percent
System General Education Requirements	18		
Subtotal, Degree Requirements		18	30%
Required Support Courses (not included above)			
Major Requirements	27		
Major Electives	9		
Subtotal, Program Requirements		36	60%
Free Electives	6	6	10%
Degree Total	60	60	100%

*If the proposed undergraduate degree program is to be available in more than one degree and the number or distribution of credits will vary, provide a separate table for each degree.

Required Support Courses outside the Major (*NOT general education, institutional graduation or technology literacy requirements*)

Prefix	Number	Course Title	Credit Hours	New (yes, no)
		NONE		
		Subtotal		

Major Requirements

Prefix	Number	Course Title	Credit Hours	New (yes, no)
CSC	105	Introduction to Computers	3	no
CSC	150	Computer Science I	3	no
CSC	245	Information Security Fundamentals	3	no
CSC	250	Computer Science II	3	no
CSC	260	Object Oriented Design	3	no
CSC	363	Hardware, Virtualization & Data Comm.	3	no
CIS	275	Web Application Programming I	3	no
CIS	332	Systems Analysis & Design	3	no
CIS	484	Database Management Systems	3	no
		Subtotal	27	

Major Electives: List courses that may be taken as electives in the program. Indicate any new courses to be added specifically for the major. (If the list of existing courses is long, it may be provided as an appendix.)

Prefix	Number	Course Title	Credit Hours	New (yes, no)
Choose 6 credits from the following courses:			9	
CIS	375	Web Application Programming II		no
CIS	340	Java Programming		no
CIS	383	Networking I		no
CIS	487	Database Programming		no
CSC	300	Data Structures		no
CSC	314	Assembly Language		no
CSC	328	Operating Environments		no
MATH	120	Trigonometry		no
MATH	123	Calculus I		no
MATH	201	Intro to Discrete Math		no
MATH	204	Math for Cyber Operations		no
MATH	281	Introduction to Statistics		no
Subtotal			9	

3. Student Outcomes & Demonstration of Individual Achievement

A. What specific knowledge and competencies, including technology competencies, will all students be able to 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 be related to the proposed assessments in B and C below.*

See Appendix A.

B. What national instruments (examinations) are available to measure individual student achievement in this field?

Not applicable.

C. How will mastery by individual students be demonstrated? Describe the specific examinations or processes to be used. This is to include external measures.¹ **What will be the consequences for students who do not demonstrate mastery?**

Students will demonstrate mastery by passing all courses within the degree with a minimum GPA of 2.0. Students will be monitored using Starfish. Students failing to meet minimum standards may be required to retake course work and any student on academic probation will be

¹ What national examination, externally evaluated portfolio or student activity, etc will be used to verify that individuals have attained a high level of competence and identify those who need additional work?

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required to attend a one-on-one probation counseling session. Additionally, tutoring will be made available to all students. Enrollment and retention in the program also will be monitored.

4. What instructional approaches and technologies will be used to teach courses in the program? *This refers to the instructional technologies used to teach courses and NOT the technology applications students are expected to learn.*

The courses will be taught at UC-Sioux Falls, distance delivery and on the university campus and supplemented with D2L courseware for virtual networking, submitting assignments, and class discussion. Class presentations may be recorded and the video will be posted to campus video servers to facilitate online delivery.

DSU has invested heavily in a virtualized infrastructure to allow for technical, hands-on experiences for students in the classroom and at a distance. This VMware environment has been instrumental in the online delivery of all undergraduate majors. Educational experiences for students are greatly enhanced through these applied, hands-one technology-based activities.

5. Did the University engage any developmental consultants² to assist with the development of the curriculum? Were any professional or accrediting associations consulted during the development of the curriculum? What were the contributions of the consultants and associations to the development of curriculum?

No.

6. Are students in the program expected to be new to the university, redirected from other programs or both? Complete the table and explain how the estimates were developed. If authorization for off-campus or distance delivery is requested in Section 9, add lines to the table for off-campus/distance students, credit hours, and graduates.

	Fiscal Years*			
	1st	2nd	3rd	4th
Estimates	FY17	FY18	FY19	FY20
Students new to the university	5	10	12	15
Students from other university programs	5	5	10	10
Continuing students		10	15	22
= Total students in the program (fall)	10	25	37	47
Program credit hours (major courses)**	90	225	333	423
Graduates		10	15	15

* 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. The same numbers are used in Appendix B – Budget.

² Developmental consultants are experts in the discipline are 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.

7. If program accreditation is available, identify the organization and explain whether accreditation is required or optional, the resources required, and the University's plans concerning the accreditation of this program.

Accreditation does not exist for this program.

8. Does the University request any exceptions to any Board policy for this program? Explain any requests for exceptions to Board Policy. If no exceptions are requested, enter "None."

None.

9. Program Delivery

A. Does the University request authorization to deliver this entire program at any off-campus locations? If yes, list location(s) and intended start date(s).

Yes, University Center Sioux Falls, Fall 2016.

B. Does the University request authorization to deliver this entire program by distance technology? If yes, identify delivery method(s) and intended start date(s).

Yes, distance delivery, Fall 2016.

C. Include off-campus tuition and site or delivery costs in the next section and in Appendix B. If off-campus or distance delivery authorization is not requested, enter "None."

10. Costs, 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 O&M, facilities, etc needed to implement the proposed major. Address off-campus or distance delivery separately. Complete Appendix B Budget and Resources and briefly summarize.

DSU currently offers multiple sections of all the major courses online and at the campus every semester using full-time and adjunct faculty. There are a few courses that are not routinely taught at the University Center in Sioux Falls, but the university will move an existing section to the UC-SF rotation to accommodate the students at the Center. Therefore, no additional costs for faculty will be incurred when this program is implemented.

11. Additional Information. *Additional information is optional. Use this space for information not requested above. Limit the number and length of additional attachments. Identify with capital letters. Letters of support are not necessary and are rarely included with Board materials. In some cases, response to questions from the Board or the Executive Director may be*

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provided as appendixes to the original proposal. This item may be deleted if it is not used.

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Appendix A
Individual Student Outcomes and Program Courses

Individual Student Outcome	Program Courses that Address the Outcomes				
	CSC 150	CSC 250	CSC 260	CIS 275	CIS 332
Demonstrate the ability to write code using sequence, selection and repetition.	X	X	X	X	
Understand and effectively manage the process of developing designing, testing, and delivering a program or web page.		X	X	X	X
Manipulate data efficiently to make optimal use of computing resources.	X	X	X	X	X
Identify, analyze, and take user needs into account in the programming process.	X	X	X	X	X
Write, test, and maintain computer programs and/or web applications in at least three languages.	X	X	X	X	