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| S:\Communications\Logos and photos\SDBORLogos\final_sdbor_webreadyBW_trans.gif | **SOUTH DAKOTA BOARD OF REGENTS**  ACADEMIC AFFAIRS FORMS |
| New Specialization |
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| --- | --- |
| **UNIVERSITY:** | **DSU** |
| **TITLE OF PROPOSED SPECIALIZATION:** | **Information Systems Specialization** |
| **NAME OF DEGREE PROGRAM IN WHICH SPECIALIZATION IS OFFERED:** | **B.S. in Mathematics** |
| **INTENDED DATE OF IMPLEMENTATION:** | **8/3/2018** |
| **PROPOSED CIP CODE:** | **27.0101** |
| **UNIVERSITY DEPARTMENT:** | **College of Arts and Sciences** |
| **UNIVERSITY DIVISION:** | **Mathematics** |

**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.*

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| C:\Users\slaughts\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Dr. McKay Signature.jpg |  | 5/2/2018 |
| Institutional Approval Signature  *President or Chief Academic Officer of the University* |  | Date |

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1. **Level of the Specialization (*place an “X” in the appropriate box*):**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Baccalaureate |  | Master’s |  | Doctoral |  |

1. **What is the nature/purpose of the proposed specialization?**

Students that complete the Mathematics program with an Information Systems specialization will have the mathematical training and tools to analyze problems from a mathematical perspective. All mathematics majors complete a technology minor and students that complete the Information Systems specialization earn an Information Systems Minor. Students that wish to earn a double major in Mathematics with a specialization in Information Systems will only need to complete the mathematics component of the specialization (as it is currently in the University Catalog).

1. **Provide a justification for the specialization, including the potential benefits to students and potential workforce demand for those who graduate with the credential.**[[1]](#footnote-1)

The American Mathematical Society has shown that the “Intensity of math competencies in its purest form over time is increasing” ([http://www.ams.org/about-us/governance/committees/ Jaco.pdf](http://www.ams.org/about-us/governance/committees/%20Jaco.pdf)). The mathematics specializations are designed to provide the mathematics training to prepare students for the mathematical career path of their choice. Career paths in education (intermediate level or secondary level) and technology (information systems or cryptography).

According to the U.S. Bureau of Labor Statistics there is a projected national job growth (2016 – 2024) for mathematicians of 33%.[[2]](#footnote-2) This specialization is the current Math for Information Systems program delivered by DSU. Most students completing this major are computer science double majors and must only complete the additional math coursework to earn the double major (support coursework is not required of double majors). These students seek the additional mathematics credential to increase their employability in a competitive job market.

1. **List the proposed curriculum for the specialization (including the requirements for completing the major – *highlight courses in the specialization*):**

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| --- | --- | --- | --- | --- |
| **Pref.** | **Num.** | **Title** | **Cr. Hrs.** | **New**  **(yes, no)** |
| **System Wide General Education Requirement**  (All students are required to take MATH 123 as part of the general education requirements) | | | **30** |  |
|  | | | |  |
| **Mathematics Core Requirements** | | | **12** |  |
| MATH | 201 | Introduction to Discrete Math | 3 | No |
| MATH | 281 | Introduction to Statistics | 3 | No |
| MATH | 315 | Linear Algebra | 3 | No |
| MATH | 316 | Discrete Mathematics | 3 | No |
| **Information Systems Specialization** | | |  |  |
|  | **Mathematics Component** | | **16** |  |
| MATH | 125 | Calculus II | 4 | No |
| Choose 12 credits from the following | | | 12 |  |
| MATH | 225 | Calculus III | 4 | No |
| MATH | 282 | Mathematics of Games | 3 | No |
| MATH | 318 | Adv. Discrete Mathematics | 3 | No |
| MATH | 321 | Differential Equations | 3-4 | No |
| MATH | 361 | Modern Geometry | 3 | No |
| MATH | 381 | Intro to Probability and Stats | 3-4 | No |
| MATH | 413 | Abstract Algebra I | 3 | No |
| MATH | 418 | Mathematical Modeling | 3 | No |
| MATH | 436 | Number Theory and Cryptography | 3 | Yes |
| MATH | 437 | Cryptography and Codes | 3 | Yes |
| MATH | 471 | Numerical Analysis I | 3 | No |
| MATH | 475 | Operations Research | 3 | No |
| MATH | 492 | Topics | 1-6\* | No |
| MATH | 498 | Undergrad Research/Scholarship | 1-6 | No |
| \*May be repeated provided student does not enroll in the same topics course. | | | |  |
| **Computer Information Systems Minor** | | | **24** |  |
| **Minor (Biology, Business Administration, Chemistry,**  **Computer Forensics, Cyber Operations, Computer Science, Physics)**  (Non-teaching majors must choose one of the above minors) | | | **18-21** |  |
| **Electives** | | | **17-20** |
| Total number of hours required for completion of specialization | | | **16** |  |
| Total number of hours required for completion of major | | | **70** |  |
| Total number of hours required for completion of degree | | | **120** |  |

Students obtaining a degree in Computer Science, Computer Game Design, Cyber Operations, Physical Science, or Biology need only complete the Mathematics Core (12 cr.) and the Mathematics Component (16 cr.) in the Information Systems Specialization to earn this as a second major.

1. **Delivery Location[[3]](#footnote-3)**

**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)?**

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| --- | --- | --- |
|  | **Yes/No** | ***Intended Start Date*** |
| **On campus** | Yes | **Fall 2018** |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Yes/No** | ***If Yes, list location(s)*** | ***Intended Start Date*** |
| **Off campus** | No |  | Choose an item.Choose an item. |

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|  | **Yes/No** | ***If Yes, identify delivery methods[[4]](#footnote-4)*** | ***Intended Start Date*** |
| **Distance Delivery (online/other distance delivery methods)** | No |  |  |

**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]](#footnote-5)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Yes/No** | ***If Yes, identify delivery methods*** | ***Intended Start Date*** |
| **Distance Delivery (online/other distance delivery methods)** | No |  | Choose an item.Choose an item. |

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. [↑](#footnote-ref-1)
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Mathematicians and Statisticians, on the Internet at <https://www.bls.gov/ooh/math/mathematicians-and-statisticians.htm> (visited June 6, 2018). [↑](#footnote-ref-2)
3. The Higher Learning Commission (HLC) and Board of Regents policy requires approval for a university to offer programs off-campus and through distance delivery. [↑](#footnote-ref-3)
4. Delivery methods are defined in [AAC Guideline 5.5](https://www.sdbor.edu/administrative-offices/academics/academic-affairs-guidelines/Documents/5_Guidelines/5_5_Guideline.pdf). [↑](#footnote-ref-4)
5. This question responds to HLC definitions for distance delivery. [↑](#footnote-ref-5)