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|  | **SOUTH DAKOTA BOARD OF REGENTS**  ACADEMIC AFFAIRS FORMS |
| New Baccalaureate Degree Minor |
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| --- | --- |
| **UNIVERSITY:** | DSU |
| **TITLE OF PROPOSED MINOR:** | **AI Cyber** |
| **DEGREE(S) IN WHICH MINOR MAY BE EARNED:** | **All majors except BS Artificial Intelligence** |
| **EXISTING RELATED MAJORS OR MINORS:** | **BS AI, Artificial Intelligence and Machine Learning Minor** |
| **INTENDED DATE OF IMPLEMENTATION:** | **Fall 2025** |
| **PROPOSED CIP CODE:** | **110102** |
| **UNIVERSITY DEPARTMENT:** | **Computer Science** |
| **BANNER DEPARTMENT CODE:** | **DSCI** |
| **UNIVERSITY DIVISION:** | **College of Computer and Cyber Sciences** |
| **BANNER DIVISION CODE:** | **8N DCOC** |

**Please check this box to confirm that:**

* The individual preparing this request has read [AAC Guideline 2.3.2.2.D](https://public.powerdms.com/SDRegents/documents/1677065), which pertains to new baccalaureate degree minor requests, and that this request meets the requirements outlined in the guidelines.
* This request will not be posted to the university website for review of the Academic Affairs Committee until it is approved by the Executive Director and Chief Academic Officer.

**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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| A picture containing text  Description automatically generated |  | 4/15/2025 |
| President of the University |  | Date |

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Note: In the responses below, references to external sources, including data sources, should be documented with a footnote (including web addresses where applicable).

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|  |  |  |
| *Yes* |  | *No* |

1. **Do you have a major in this field (*place an “X” in the appropriate box*)?**
2. **If you do not have a major in this field, explain how the proposed minor relates to your university mission and strategic plan, and to the current Board of Regents Strategic Plan 2014-2020.**

*Links to the applicable State statute, Board Policy, and the Board of Regents Strategic Plan are listed below for each campus.*

*BHSU:* [*SDCL § 13-59*](https://sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=13-59)[*BOR Policy 1.2.1*](https://public.powerdms.com/SDRegents/documents/1729445)

*DSU:* [*SDCL § 13-59*](https://sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=13-59)[*BOR Policy 1.2.2*](https://public.powerdms.com/SDRegents/documents/1729444)

*NSU:* [*SDCL § 13-59*](https://sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=13-59)[*BOR Policy 1.2.3*](https://public.powerdms.com/SDRegents/documents/1729443)

*SDSMT:* [*SDCL § 13-60*](https://sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=13-60)[*BOR Policy 1.2.4*](https://public.powerdms.com/SDRegents/documents/1729442)

*SDSU:* [*SDCL § 13-58*](https://sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=13-58)[*BOR Policy 1.2.5*](https://public.powerdms.com/SDRegents/documents/1729439)

*USD:* [*SDCL § 13-57*](https://sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=13-57)[*BOR Policy 1.2.6*](https://public.powerdms.com/SDRegents/documents/1729438)

[*Board of Regents Strategic Plan*](http://sdbor.edu/wp-content/uploads/2023/09/StrategicPlan_22_27.pdf)

1. **What is the nature/purpose of the proposed minor? Please include a brief (1-2 sentence) description of the academic field in this program.**

Artificial Intelligence (AI) is rapidly transforming the cybersecurity landscape and reshaping the skills required for the future workforce. The proposed minor in AI Cyber, when paired with DSU’s Network Security and Administration or Cyber Operations degrees, aligns with the AI Cyber knowledge units within the newly introduced CyberAI Plans of Study -- part of the National Centers of Academic Excellence in Cybersecurity (NCAE-C) program managed by the NSA’s National Cryptologic School.

1. **How will the proposed minor benefit students?**

This minor prepares students to become part of an AI-enabled cybersecurity workforce by developing the skills needed to understand both the benefits and risks of AI, and to apply AI effectively across sectors and job roles.

1. **Describe the workforce demand for graduates in related fields, 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. Please cite any sources in a footnote.*

The proposed minor in AI Cyber is justified by the increasing convergence of these two critical fields. As cyber threats become more sophisticated, leveraging artificial intelligence is essential for developing advanced security solutions. For students, this specialization offers the opportunity to acquire a unique skill set that combines expertise in AI algorithms with practical cybersecurity strategies, enhancing their competitiveness in the job market.

According to the U.S. Bureau of Labor Statistics, employment of information security analysts is projected to grow 35% from 2021 to 2031, outpacing the national average for all occupations. The demand is even higher for professionals who can integrate AI into cybersecurity practices. Industry reports highlight a nationwide shortage of skilled experts in both AI and cybersecurity sectors, indicating strong workforce demand for graduates with this combined knowledge.

Graduates of this specialization will be well-positioned for roles such as AI cybersecurity specialists, machine learning security engineers, and AI threat analysts. These positions are vital for organizations aiming to protect their digital assets against sophisticated cyber-attacks using AI-enhanced methods. Offering this specialization aligns with our commitment to innovation and excellence, ensuring our graduates are both workforce-ready and leaders in the fast-evolving fields of AI and cybersecurity.

1. **Provide estimated enrollments and completions in the table below and explain the methodology used in developing the estimates (*replace “XX” in the table with the appropriate year*).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Fiscal Years\*** | | | |
|  | **1st** | **2nd** | **3rd** | **4th** |
| *Estimates* | **FY 25/26** | **FY 26/27** | **FY 27/28** | **FY 28/29** |
| **Students enrolled in the minor (fall)** | **5** | **10** | **15** | **20** |
| **Completions by graduates** | **0** | **4** | **8** | **15** |

\*Do not include current fiscal year.

1. **What is the rationale for the curriculum? Demonstrate/provide evidence that the curriculum is consistent with current national standards.**

The student learning outcomes and knowledge units are in alignment with the recently developed and published Plan of Student in AI Cyber under the National Centers of Academic Excellence in Cybersecurity. Multiple DSU faculty members were invited to participate in the development of these knowledge units and DSU has been invited to participate in the Plan of Study (PoS) Validation pilot program.

Knowledge Units

<https://dl.dod.cyber.mil/wp-content/uploads/cae/pdf/unclass-cyber_ai_kus_stoneman.pdf>

Program Guidelines

<https://dl.dod.cyber.mil/wp-content/uploads/cae/pdf/unclass-cae_pos-cyberai.pdf>

1. **Complete the tables below. Explain any exceptions to Board policy requested.**

*Minors by design are limited in the number of credit hours required for completion. Minors typically consist of eighteen (18) credit hours, including prerequisite courses. In addition, minors typically involve existing courses. If the curriculum consists of more than eighteen (18) credit hours (including prerequisites) or new courses, please provide explanation and justification below.*

1. **Distribution of Credit Hours**

|  |  |  |
| --- | --- | --- |
| **AI Cyber Minor** | **Credit Hours** | **Percent** |
| Requirements in minor | 21 | 100% |
| Electives in minor | 0 | 0% |
| Total | 21 |  |

1. **Required Courses in the Minor**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Prefix** | **Number** | **Course Title**  *(add or delete rows as needed)* | **Prerequisites for Course**  *Include credits for prerequisites in subtotal below.* | **Credit Hours** | **New**  **(yes, no)** |
| CSC | 230 | Tech Foundations: Ethics | None | 1 | No |
| CSC | 232 | Tech Foundations: Scripting | None | 1 | No |
| CSC | 233 | Tech Foundations: Secure AI Lifecycles | None | 1 | Yes |
| CIS | 368 | Predictive Analytics | CIS 372 and (BADM 220 or MATH 281 or MATH 381) | 3 | No |
| CIS | 372 | Programming for Analytics | CIS 123 or  CIS 130 or  CSC 150 | 3 | No |
| MATH | 281 | Introduction to Statistics | Math 114 | 3 | No |
| CSC | 447 | Artificial Intelligence | CSC 250 | 3 | No |
| CSC | 381 | Offensive Applications of AI | \*CSC 134 and (CSC 247 or CSC 447) | 3 | Yes |
| CSC | 382 | Adversarial AI and Security | \*CSC 134 and (CSC 247 or CSC 447) | 3 | Yes |
|  |  |  | Subtotal | 21 |  |

To ensure full coverage of the required CAE Knowledge Units, we propose that this minor include 21 credits—3 more than the standard 18-credit minor. Both DSU’s Network Security and Administration and Cyber Operations degrees have sufficient flexibility to allow students to complete this minor within the 120-credit hour limit for a bachelor’s degree.

\* Students who are not required to take CSC 134 as part of their major will need to include it as an elective.

1. **Elective Courses in the Minor:** **List courses available as electives in the program. Indicate any proposed new courses added specifically for the minor.**

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| --- | --- | --- | --- | --- | --- |
| **Prefix** | **Number** | **Course Title**  *(add or delete rows as needed)* | **Prerequisites for Course**  *Include credits for prerequisites in subtotal below.* | **Credit Hours** | **New**  **(yes, no)** |
|  |  |  |  |  | Choose an item. |
|  |  |  | Subtotal | 0 |  |

* 1. **What are the learning outcomes expected for all students who complete the minor? How will students achieve these outcomes?** *Complete the table below to list specific learning outcomes—knowledge and competencies—for courses in the proposed program in each row. Label each column heading with a course prefix and number. Indicate required courses with an asterisk (\*). Indicate with an X in the corresponding table cell for any student outcomes that will be met by the courses included. 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.*

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| --- | --- | --- | --- | --- | --- | --- |
|  | Program Courses that Address the Outcomes | | | | | |
| Individual Student Outcome | CIS 447 | CIS 368 | CSC 231 | CSC 233 | CSC 381 | CSC 382 |
| Understand Ethical and Legal Considerations of Artificial Intelligence |  |  | X | X |  |  |
| Understand AI and Machine Learning Fundamentals | X |  |  |  |  |  |
| Implement AI-Driven Security Solutions |  |  | X |  |  |  |
| Automate Anomalous Behavior Detection |  |  |  |  |  |  |
| Analyze Large-Scale Data |  | X |  |  |  |  |
| Secure AI Systems |  |  |  | X |  | X |
| Integrate AI with Existing Security Infrastructure |  |  |  |  | X | X |
| Customize AI Solutions for Specific Cybersecurity Needs |  |  |  |  | X | X |

Note: Individual Student Outcomes are from the proposed CAE Cyber AI Student Outcomes.

Graduates of AI for Cybersecurity (AICyber) programs will be able to:

1. **Understand Ethical and Legal Considerations**: Navigate the ethical and legal issues surrounding the use of AI in cybersecurity, ensuring compliance with regulations and ethical standards.
2. **Understand AI and Machine Learning Fundamentals**: Grasp the core concepts of AI and machine learning, mainly as they apply to cybersecurity, including supervised and unsupervised learning, machine learning, neural networks, and deep learning.
3. **Implement AI-Driven Security Solutions**: Develop and deploy AI-driven tools and algorithms that enhance the detection, prevention, and response to cyber threats.
4. **Automate Anomalous Behavior Detection**: Use AI to detect cyber threats, including malware, phishing attacks, and network intrusions, by recognizing patterns, anomalies, and suspicious activities within vast datasets, networks, systems, and user behavior that may indicate a cyber attack.
5. **Analyze Large-Scale Data**: Use AI to process and analyze large volumes of security-related data, identifying hidden threats, trends, and potential vulnerabilities in real-time.
6. **Secure AI Systems**: Understand and address the specific security challenges associated with AI systems, including protecting against adversarial attacks and ensuring the integrity of AI models.
7. **Integrate AI with Existing Security Infrastructure**: Seamlessly integrate AI tools with existing cybersecurity infrastructure to enhance overall security posture.
8. **Customize AI Solutions for Specific Cybersecurity Needs**: Tailor AI-driven security solutions to meet the specific needs of different organizations, industries, and threat landscapes.
9. **What instructional approaches and technologies will instructors use to teach courses in the minor?** *This refers to the instructional technologies and approaches used to teach courses and NOT the technology applications and approaches expected of students.*

Instructors will use a blend of hands-on labs, case studies, and project-based learning to engage students in real-world applications of AI in cybersecurity. Courses will leverage technologies such as AI modeling tools, cybersecurity assessment platforms, and virtual lab environments to support interactive and experiential learning.

1. **Delivery Location**

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

1. **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., USD Community Center for Sioux Falls, Black Hills State University-Rapid City, Capital City Campus, etc.) or deliver the entire program through distance technology (e.g., as an online program)?**

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| --- | --- | --- |
|  | **Yes/No** | ***Intended Start Date*** |
| **On campus** | Yes | **Fall 2025** |

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|  | **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***  *Delivery methods are defined in AAC Guideline* [*2.4.3.B*](https://public.powerdms.com/SDRegents/documents/1677940)*.* | ***Intended Start Date*** |
| **Distance Delivery (online/other distance delivery methods)** | Yes | Online | **Fall 2025** |
| **Does another BOR institution already have authorization to offer the program online?** | No | **If yes, identify institutions:** | |

1. **Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the minor through distance learning (e.g., as an online program)?** *This question responds to HLC definitions for distance delivery.*

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

None.

1. **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 minor.** *Address off-campus or distance delivery separately.*

There are no additional costs associated with this minor. The new courses are part of an update to the BS in Artificial Intelligence (with no change in total credits) to align with CAE Knowledge Units and can also be used as CSC or general electives in multiple degree programs.

1. **New Course Approval: New courses required to implement the new minor may receive approval in conjunction with program approval or receive approval separately. Please check the appropriate statement (*place an “X” in the appropriate box*).**

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|  | YES, |

*the university is seeking approval of new courses related to the proposed program in conjunction with program approval. All New Course Request forms are included as Appendix C and match those described in section 7.*

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|  | 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.*

1. **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.*