SOUTH DAKOTA BOARD OF REGENTS

Academic and Student Affairs
Consent

AGENDA ITEM: 5 – C (2)
DATE: December 13-14, 2023

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SUBJECT
　　New Graduate Certificate Request – USD – Artificial Intelligence for Business
　　Analytics

CONTROLLING STATUTE, RULE, OR POLICY
　　BOR Policy 2.3.2 – New Programs, Program Modifications, Curricular Requests, and
　　　　Inactivation/Termination

BACKGROUND / DISCUSSION
　　The University of South Dakota (USD) requests authorization to offer a graduate certificate
　　in Artificial Intelligence for Business Analytics. The proposed certificate aims to equip
　　students to understand and apply artificial intelligence and cognitive technologies to
　　business problems. The developing field of artificial intelligence seeks to create systems
　　and solutions to problems through computer processes that mimic the reasoning
　　capabilities of the human mind. AI technologies are increasingly incorporated into the
　　business world.

IMPACT AND RECOMMENDATION
　　USD plans to offer the proposed certificate on campus, online, and via hybrid delivery.
　　USD does not request new state resources. One new course will be required.

　　Board office staff recommends approval.

ATTACHMENTS
　　Attachment I – New Certificate Request Form: USD – Artificial Intelligence for Business
　　　　Analytics

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DRAFT MOTION 20231213_5-C(2):
　　I move to authorize USD to offer a graduate certificate in Artificial Intelligence for
　　Business Analytics, as presented.

SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Certificate

UNIVERSITY:	**University of South Dakota**
TITLE OF PROPOSED CERTIFICATE:	**Artificial Intelligence for Business Analytics**
INTENDED DATE OF IMPLEMENTATION:	**August 26, 2024**
PROPOSED CIP CODE:	**52.1399**
UNIVERSITY DEPARTMENT:	**Economics and Decision Sciences**
BANNER DEPARTMENT CODE:	**UEDS**
UNIVERSITY DIVISION:	**The Beacom School of Business**
BANNER DIVISION CODE:	**2B**

X	**Please check this box to confirm that (place an "X" in the left box):** ● The individual preparing this request has read AAC Guideline 2.7, which pertains to new certificate requests, and that this request meets the requirements outlined in the guidelines. ● This request will not be posted to the university website for review by 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.

Elizabeth M. Freeburg	10/19/2023
Institutional Approval Signature	Date
President or Chief Academic Officer of the University	

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

1. **Is this a graduate-level certificate or undergraduate-level certificate? (place an "X" before the graduate type)**

	Undergraduate Certificate	X	Graduate Certificate

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

The developing field of artificial intelligence seeks to create systems and solutions to problems through computer processes that mimic the reasoning capabilities of the human mind. AI technologies are increasingly incorporated into the business world. The proposed Artificial

Intelligence for Business Analytics graduate certificate aims to equip students to understand and apply artificial intelligence and cognitive technologies to business problems.

3. **If you do not have a major in this field, explain how the proposed certificate relates to your university mission and strategic plan and 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*	*BOR Policy 1:10:4*
DSU:	*SDCL § 13-59*	*BOR Policy 1:10:5*
NSU:	*SDCL § 13-59*	*BOR Policy 1:10:6*
SDSMT:	*SDCL § 13-60*	*BOR Policy 1:10:3*
SDSU:	*SDCL § 13-58*	*BOR Policy 1:10:2*
USD:	*SDCL § 13-57*	*BOR Policy 1:10:1*

   Board of Regents Strategic Plan 2014-2020

   The Artificial Intelligence for Business Analytics Certificate conforms to the SDCL 13-57 directive to provide professional education in business. It fits within BOR Policies 1:10:1:C:1, 1:10:1:D, and 1:10:1:E by offering business education and supporting small- and medium-sized businesses. The certificate conforms to The South Dakota Board of Regents' mission and vision for public higher education by contributing an excellent, efficient, accessible, equitable, and affordable business-oriented artificial intelligence certificate. The certificate will improve South Dakota's overall educational attainment and research productivity while enriching the intellectual and economic life of the state.

4. **Provide a justification for the certificate program, including the potential benefits to students and potential workforce demand for those who graduate with the credential.** *For workforce related information, please provide data and examples. Data 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 Artificial Intelligence for Business Analytics Certificate (AIBAC) in the School of Business provides a path to business artificial intelligence expertise, such as improving patient care coordination in healthcare, improving financial performance in fiscal matters, and correcting supply chain interruptions in production operations. AI expertise lends itself to the application of cognitive technology to enhance competencies when computing decisions. Artificial intelligence capabilities will be attained through the AIBAC. We propose to follow the South Dakota legislature's directives, the BOR policies, and strategic plans, as well as USD's strategic plans, to use the AIBAC to meet the needs of employers who seek professionals with cutting-edge software and data-savvy expertise.

   The South Dakota legislature has established the University of South Dakota's mission, which includes that it is *to provide professional education in business*. The BOR has recognized USD as *the comprehensive university of the South Dakota System of Higher Education*. The BOR's strategic plan for 2014-2020 seeks *to expand educational access as one of the action steps for student success goals*. USD's strategic theme six, which seeks to *provide access to a first-class education efficiently and effectively*, is a focus of this proposed certificate.

The demand for artificial intelligence talent has never been greater; AI has become essential for moving decisions from experience-based to information-plus-experience-based. An article from the Harvard Business Review[1] shows the structure of the shift.

A Decision-Making Model That Combines the Power of AI and Human Judgment
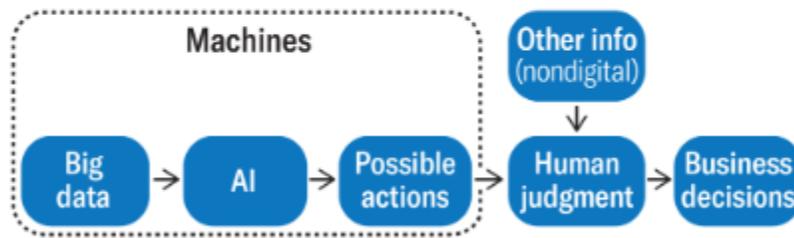
Source: Eric Colson   ▽ HBR

That transition has improved organizational efficiency, breadth of decision support, and, most importantly, effectiveness. Innovative organizations recognize data as an asset and are finding ways to distill insights from data more rapidly than ever before. Oberlo[2] demonstrates the potential with the following details:

- The global artificial intelligence market is expected to reach $1.59 trillion by 2023.
- More than 9 in 10 lading businesses have ongoing investments in artificial intelligence.
- 61% of employees say AI helps to improve their productivity.
- 62% of consumers are willing to submit data to AI to have better experiences with businesses.
- 15% of all customer service interactions globally were estimated to have been fully powered by AI in 2021.
- Nearly 1 in 4 sales teams currently use AI in their day-to-day work.
- 54% of organizations have reported cost savings and efficiencies due to AI implementation.
- The number of AI-powered voice assistants is forecast to reach 8 billion by 2023- a 146% increase from 2019's 3.25 billion.
- More than 3 in 4 businesses say it is important for them to be able to trust AI's analysis, results, and recommendations.

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[1] What AI-Driven Decision Making Looks Like (hbr.org)

[2] https://www.oberlo.com/blog/artificial-intelligence-statistics

The South Dakota Department of Labor defines three broad divisions of industry types: non-agricultural, agricultural, and nonfarm. Each division, as well as state and local government, has increasing amounts of data available for analysis. Oberlo's recent report describes how industries can benefit from individuals who combine business and AI to derive optimal actions from data with more informed decision-making and checks for impartiality, transparency, responsibility, and accountability.

Projection data from the South Dakota Department of Labor and Regulation's (DLR) Occupational Employment Projections forecasted to 2030 indicates that expertise in the application of AI-driven technologies for informed decision-making will be an expectation for a variety of business industry positions from finance to marketing to overall management. An abbreviated table of the South Dakota Department of Labor's Occupational Employment Projections for 2020-2030 indicates that data science and analyst occupations include four of the top sixteen percent change slots and two of the top twenty in numeric change positions. [3]

South Dakota Occupational Employment Projections 2020-2030 (partial listing)								
						Average Annual Openings		
SOC Code	SOC Title	2020 Employment	2030 Employment	Numeric Change	Percent Change	Due to Exits	Due to Transfers	Due to Annual Change	Total Openings
13-1111	Management Analysts	3,289	3,739	450	13.68%	113	202	45	360
13-1161	Market Research Analysts and Marketing Specialists	1,084	1,363	279	25.74%	29	89	28	146
13-2031	Budget Analysts	123	128	5	4.07%	3	6	0	9
13-2041	Credit Analysts	415	421	6	1.45%	7	28	1	36
13-2098	Financial and Investment Analysts, Financial Risk Specialists, and	867	965	98	11.30%	16	52	10	78
15-1211	Computer Systems Analysts	896	1,018	122	13.62%	19	47	12	78
15-1212	Information Security Analysts	431	613	182	42.23%	8	29	18	55
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	2,649	3,440	791	29.86%	71	149	79	299
15-2098	Data Scientists and Mathematical Science	57	78	21	36.84%	1	3	2	6

Note that the occupations include four of the top sixteen Percent Change slots, and two of the top twenty Numeric Change positions.

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[3] South Dakota Department of Labor and Regulation – Statewide South Dakota Employment Projections by Occupation, Retrieved from https://dlr.sd.gov/lmic/menu_projections_occupation_statewide.aspx

The statistics surrounding these roles demonstrate a need for these occupations and a level of expertise is required for those who will hold these occupations as they will need to be able to apply AI that will potentially increase performance and outputs, and enhance functions across business capabilities. Additionally, occupations requiring the application of AI-informed technologies need specific knowledge, and this program offers an opportunity to gain that knowledge.

All who work as analysts perform their work using analytics. Analytics is the systematic process of discovering knowledge from data, and invariably entails the use of the constituent components of artificial intelligence, including automated reasoning, machine learning, natural language processing, and artificial neural networks for deep and reinforcement learning. Without artificial intelligence tools, analysts would be unable to make predictions based on data. They would no longer be analysts; they would be speculators. See Agrawal, A., Gans, J., & Goldfarb, A. (2017) 1486511104226. What to expect from artificial intelligence, and Kim, M. Y., Atakishiyev, S., Babiker, H. K. B., Farruque, N., Goebel, R., Zaïane, O. R., ... & Chun, P. (2021). A multi-component framework for the analysis and design of explainable artificial intelligence. Machine Learning and Knowledge Extraction, 3(4), 900-921.

The U.S. Bureau of Labor Statistics identifies AI-related occupations are among the fastest growing in America.[4] Each category (data scientists, information security analysts, statisticians) identified qualifies as an area that overlaps with this proposed certificate. Graduates who will manage members of those disciplines (which the MBA prepares them for) often begin their careers doing the same analytical work as members trained in those three disciplines before ascending to a supervision role. Business students create models that predict outcomes, prescribe optimal use of constrained resources, and operationalize optimal prescriptions; they apply theory to business problems. We are committed to developing a current and relevant curriculum to meet industry needs, and this certificate aligns with the education and expertise needed for AI-related occupations.

Chart 15. Ten fastest growing occupations, projected 2021–31
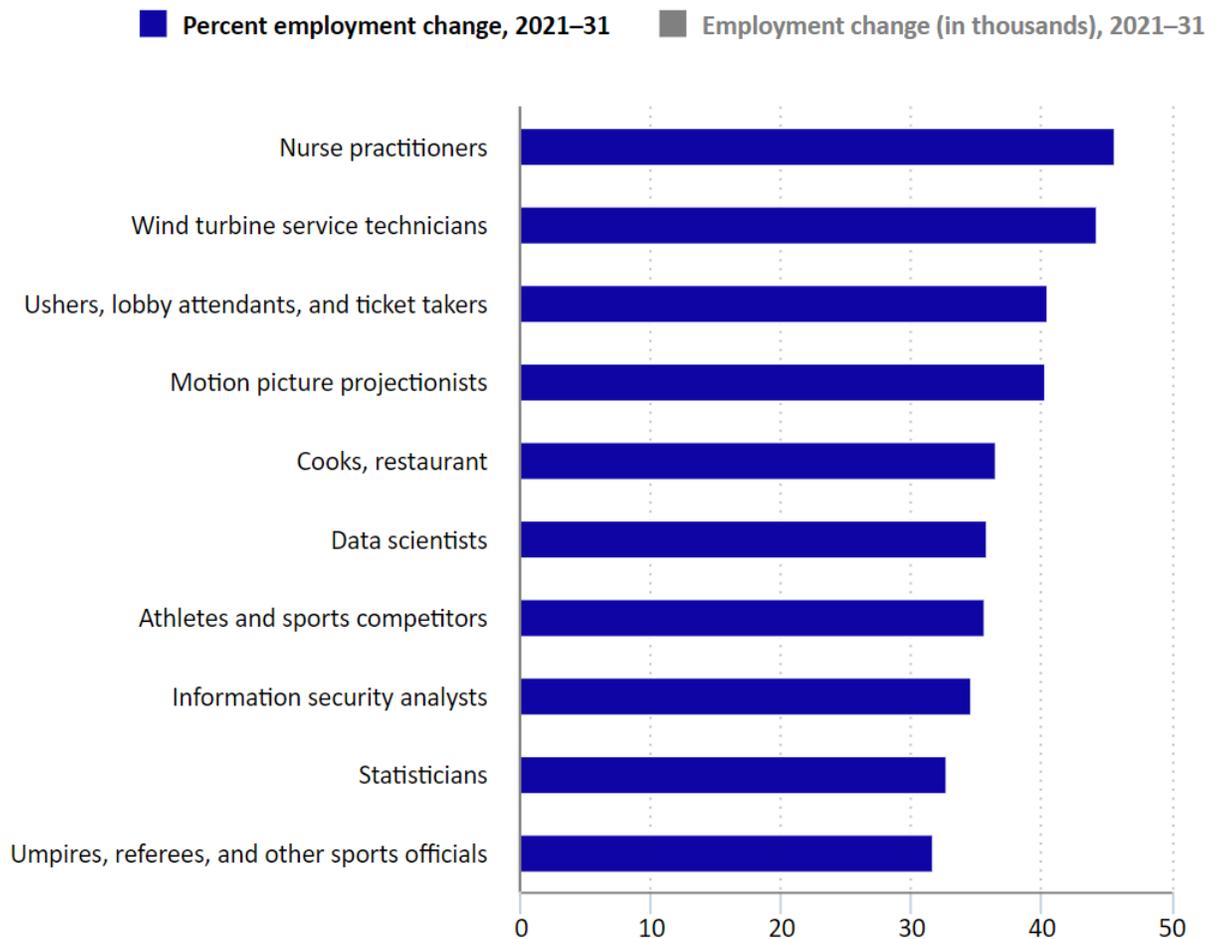
5. Who is the intended audience for the certificate program (including but not limited to the majors/degree programs from which students are expected)?

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[4] U.S. Bureau of Labor Statistics, November 2022, Projections overview and highlights, 2021–31
https://www.bls.gov/opub/mlr/2022/article/projections-overview-and-highlights-2021-31.htm

AIBAC will allow students who want to focus on the managerial aspects of the application and interpretation of artificial intelligence in business instead of software development aspects of AI to do so.

6. **Certificate Design**
    A. **Is the certificate designed as a stand-alone education credential option for students not seeking additional credentials (i.e., a bachelor's or master's degree)? If so, what areas of high workforce demand or specialized body of knowledge will be addressed through this certificate?**
        The certificate is primarily a standalone education credential. The prerequisites should have been completed as part of the applicant's baccalaureate. If an applicant did not complete the prerequisites, that applicant must finish them prior to beginning the certificate coursework. However, some students may use the same coursework in one of the other graduate degrees offered in the School of Business. As shown above, the workforce demand for artificial intelligence knowledge is great. Applying the skills learned through the certificate coursework will enable certificate-holders to create the products and services that realize the benefits of AI.

    B. **Is the certificate a value-added credential that supplements a student's major field of study? If so, list the majors/programs from which students would most benefit from adding the certificate.**
        The certificate is a value-added credential for certain students. Those who complete the AI certificate will have additional competencies in AI application in business that are not covered in the current MBA or MAcc programs. Students enrolled in the MBA or MAcc would benefit from this certificate.

    C. **Is the certificate a stackable credential with credits that apply to a higher-level credential (i.e., associate, bachelor's, or master's degree)? If so, indicate the program(s) to which the certificate stacks and the number of credits from the certificate that can be applied to the program.**
        Students completing the Artificial Intelligence for Business Analytics Certificate may use those credits to pursue an MSBA, an MBA with the Business Analytics Specialization, or the MAcc with the Accounting Analytics Specialization in The Beacom School of Business.

7. **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).**

Prefix	Num	Course Title	Prerequisites for Course	Credit Hours	New (yes, no)
DSCI	505	Business Analytics Fundamentals		3	No
DSCI	724	Data Mining for Managers	BADM 220 or BADM 501	3	No
DSCI	725	Data Mining for Competitive Advantage	DSCI 724	3	No
DSCI	729	Business Artificial Intelligence Applications	(BADM 501 or (BADM 321 *and* MATH 121 or MATH 123)) *and* DSCI 505 *	3	Yes

Prefix	Num	Course Title	Prerequisites for Course	Credit Hours	New (yes, no)
*Admission will review these requirements. Since the certificate is a graduate certificate, students enrolling in the program must have completed the undergraduate courses to be able to complete the certificate program.			Subtotal	12	

8. **Student Outcome and Demonstration of Individual Achievement.**
   Board Policy 2:23 requires certificate programs to "have specifically defined student learning outcomes.

   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.*
   The proposed certificate is designed to combine a business perspective with the tools of artificial intelligence through a curriculum that prepares graduates to succeed as digital innovation practitioners, applied artificial intelligence specialists, and data-driven business professionals. The students in the courses will demonstrate professional communication skills using artificial intelligence deliverables, demonstrate critical thinking and experimentation skills using artificial intelligence methods as applied to business problems, demonstrate knowledge of the basic principles of artificial intelligence in a business context, and demonstrate an understanding of ethical decision-making when applying business artificial intelligence techniques.

   B. **Complete the table below to list specific learning outcomes – knowledge and competencies – for courses in the proposed program in each row.** <u>*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.*</u>

Individual Student Outcome	DSCI 505	DSCI 724	DSCI 725	DSCI 729
Demonstrate professional communication skills using artificial intelligence deliverables		X	X	X
Demonstrate critical thinking and experimentation skills using artificial intelligence methods as applied to business problems	X	X	X	X
Demonstrate knowledge of the basic principles of artificial intelligence in a business context	X	X	X	X
Demonstrate an understanding of ethical decision-making when applying business artificial intelligence techniques		X		X

Modify the table as necessary to include all student outcomes. Outcomes in this table are to be the same ones identified in the text.

9. **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.

   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., USD Community College 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 on-line program)?**

	Yes/No	*Intended Start Date*
On campus	Yes	August 26, 2024

	Yes/No	*If Yes, list location(s)*	*Intended Start Date*
Off-campus	No		

	Yes/No	*If Yes, identify delivery methods* *Delivery methods are defined in AAC Guideline 5.5.*	*Intended Start Date*
Distance Delivery (online/other distance delivery methods)	Yes	U15 U18	August 26, 2024
Does another BOR institution already have authorization to offer the program online?	No	**If yes, identify institutions:**	

   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)?** *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)	Yes	U01 U15, U18	August 26, 2024