SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Certificate

UNIVERSITY:	**USD**
TITLE OF PROPOSED CERTIFICATE:	**Technology Development and Entrepreneurship**
INTENDED DATE OF IMPLEMENTATION:	**Spring 2021**
PROPOSED CIP CODE:	**52.0210**
UNIVERSITY DEPARTMENT:	**Graduate Studies [UGST]**
UNIVERSITY DIVISION:	**Graduate School [2G]**

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

- 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 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.

Elizabeth M. Freeburg	10/22/2020
Institutional Approval Signature	Date
President or Chief Academic Officer of the University	

1. **Is this a graduate-level certificate or undergraduate-level certificate?**
   Undergraduate Certificate ☐ 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 purpose of the Technology Development and Entrepreneurship Certificate is to 1) give USD graduates a competitive edge in a constantly evolving job market, 2) make tangible positive impacts on South Dakota's knowledge economy, and 3) foster deep connections between USD and external stakeholders. The Technology Development and Entrepreneurship Certificate is a blend of STEM education and real-world training in business analysis and technology evaluation. The academic fields for the Technology Development and Entrepreneurship Certificate include biomedical engineering, basic biomedical sciences, business, chemistry, biology, computer science, and physics.

3. **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*	*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 Technology Development and Entrepreneurship Certificate provides professional education and promotes scholarly and creative activity. By providing students real-world opportunities to develop USD technologies, the Technology Development and Entrepreneurship Certificate prepares the next generation of STEM professionals and entrepreneurs. The Certificate program is a novel approach to furthering USD's contributions to South Dakota's economy and workforce.

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.*

   According to a 2017 U.S. Bureau of Labor Statistics study, "Employment in STEM occupations grew by 10.5 percent, or 817,260 jobs, between May 2009 and May 2015, compared with 5.2 percent net growth in non-STEM occupations."[1] The Professional, Scientific, and Technical Services industry in South Dakota will experience a 12% growth rate through 2026.[2] Our state's burgeoning bioscience and technology industries will need highly-skilled professionals to meet these demands, and the proposed Certificate program will deliver.

   This value-added, stackable credential will provide tangible support for USD graduates facing a competitive job market: completion of the Certificate demonstrates to employers the ability to think critically across disciplines and solve practical problems. Real-world interactions with inventors, business leaders, and area experts provide education beyond that classroom, and employers will recognize the significance of that experience.

   USD's Technology Readiness Acceleration Center (TRAC) is training scientist-entrepreneurs as we speak, and TRAC will provide a steady stream of certificate candidates. TRAC is currently funded for three years: both a SD BOR grant worth nearly $150,000 and a Federal EDA grant worth $1.2 million have been awarded.

5. **Who is the intended audience for the certificate program (including but not limited to the majors/degree programs from which students are expected)?**
   The Certificate will be available to current and incoming MA, MS, and PhD students at the main campus in Vermillion, SD and students at the GEAR Center in Sioux Falls, SD. The certificate is also a good fit for advanced undergrads who are pursuing an accelerated MA. As stated above, most TRAC students will pursue the certificate. There are currently four TRAC funded fellows and four departmentally funded TRAC students. That number will increase with the addition of EDA funding mentioned above.

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?**

      No, the certificate is designed for USD students pursuing a graduate degree.

[1] Stella Fayer, Alan Lacey, and Audrey Watson, "STEM Occupations: Past, Present, And Future," U.S. Bureau of Labor Statistics (January 2017) https://www.bls.gov/spotlight/2017/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future/home.htm

[2] South Dakota Department of Labor and Regulation, "Hot Careers," Labor Market Information Center, Long Term Industry Projections, https://dlr.sd.gov/lmic/menu_hot_careers.aspx

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.

Yes, the certificate is intended to supplement a USD graduate-level education. The disciplines most likely to benefit would be: biomedical engineering, basic biomedical sciences, chemistry, biology, computer science, physics, and business. However, students in non-STEM disciplines or STEM-related disciplines may find value as well.

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.

Yes, in most cases the certificate includes credits that may be applied both to a student's major field of study and to the certificate itself.

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	Number	Course Title	Prerequisites for Course	Credit Hours	New (yes, no)
BME	788	Master's Research Problems/Project		3	No
Two elective courses approved by the TRAC director. Two elective courses approved by the TRAC director. Elective courses will be chosen from a major area of study in consultation with the TRAC director and the student's academic advisor. Elective courses should be relevant to two of the following: a) experimental design in the sciences, b) business and marketing, c) safe and effective use of technical equipment, d) foundational knowledge in the student's area of study, or e) technology development.				6	No
			Subtotal	**9**	

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?

Students who complete the certificate will:

- Understand salient indicators of a technology's commercialization potential
- Determine technology readiness level using industry-recognized methodologies
- Recognize the principles of sound experimental design techniques
- Learn proper and safe use of scientific equipment and facilities
- Identify funding opportunities and develop grant preparation skills
- Understand issues related to intellectual property

B. 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.*

Complete the table below to list specific learning outcomes – knowledge and competencies – for courses in the proposed program in each row.

	Program Courses that Address the Outcomes		
Individual Student Outcome	BME 788*	Elective Courses	
Understand salient indicators of a technology's commercialization potential	x		
Determine technology readiness level using industry-recognized methodologies	x		
Recognize the principles of sound experimental design techniques		x	x
Learn proper and safe use of scientific equipment and facilities		x	x
Identify funding opportunities and develop grant preparation skills	x		
Understand issues related to intellectual property	x		
Master discipline-specific knowledge and skills		x	x

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., 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)?

	Yes/No	***Intended Start Date***
On campus	Yes	**Spring 2021**

	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	TRAC uses webinar and other online training platforms.	**Spring 2021**
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)	No		