

**SOUTH DAKOTA BOARD OF REGENTS**

**Academic and Student Affairs**  
**Consent**

**AGENDA ITEM: 5 – C (5)**  
**DATE: May 13-15, 2024**

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**SUBJECT**

**New Program Request – SDSMT – Minor in Construction Engineering**

**CONTROLLING STATUTE, RULE, OR POLICY**

[BOR Policy 2.3.2](#) – New Programs, Program Modifications, and Inactivation/Termination

**BACKGROUND / DISCUSSION**

South Dakota School of Mines & Technology (SDSMT) requests authorization to offer a minor in Construction Engineering. The proposed minor will provide graduates with an introduction to the field of construction engineering and the application of the tools and skills needed to address the problems they encounter during the planning, design, and management of construction projects.

**IMPACT AND RECOMMENDATION**

SDSMT plans to offer the minor in Construction Engineering on campus. SDSMT does not request new state resources. No new courses will be required. SDSMT estimates 15 students enrolled and 15 graduates by the fourth year of the program.

Board office staff recommends approval.

**ATTACHMENTS**

Attachment I – New Program Request Summary: SDSMT – Minor in Construction Engineering

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**DRAFT MOTION 20240513\_5-C(5):**

I move to authorize SDSMT to offer a minor in Construction Engineering, as presented.



**SOUTH DAKOTA BOARD OF REGENTS  
ACADEMIC AFFAIRS FORMS**

**New Baccalaureate Degree Minor**

Use this form to propose a new baccalaureate degree minor (the minor may include existing and/or new courses. An academic minor within a degree program enables a student to make an inquiry into a discipline or field of study beyond the major or to investigate a particular content theme. Minors provide a broad introduction to a subject and therefore develop only limited competency. Minors consist of a specific set of objectives achieved through a series of courses. Course offerings occur in a specific department or may draw from several departments (as in the case of a topical or thematic focus). In some cases, all coursework within a minor proscribed; in others cases, a few courses may form the basis for a wide range of choices. Regental undergraduate minors typically consist of 18 credit hours. Proposals to establish new minors as well as proposals to modify existing minors must recognize and address this limit. The Board of Regents, Executive Director, and/or their designees may request additional information about the proposal. After the university President approves the proposal, submit a signed copy to the Executive Director through the system Chief Academic Officer. Only post the New Baccalaureate Degree Minor Form to the university website for review by other universities after approval by the Executive Director and Chief Academic Officer.

<b>UNIVERSITY:</b>	SDSM&T
<b>TITLE OF PROPOSED MINOR:</b>	<b>Construction Engineering</b>
<b>DEGREE(S) IN WHICH MINOR MAY BE EARNED:</b>	<b>Any Engineering BS degree</b>
<b>EXISTING RELATED MAJORS OR MINORS:</b>	<b>UG = none (Construction &amp; Engineering Management MS)</b>
<b>INTENDED DATE OF IMPLEMENTATION:</b>	<b>Fall 2024</b>
<b>PROPOSED CIP CODE:</b>	<b>14.3301</b>
<b>UNIVERSITY DEPARTMENT:</b>	<b>Civil &amp; Environmental Engineering</b>
<b>BANNER DEPARTMENT CODE:</b>	<b>MCEE</b>
<b>UNIVERSITY DIVISION:</b>	<b>4E</b>
<b>BANNER DIVISION CODE:</b>	<b>4E</b>

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

- The individual preparing this request has read [AAC Guideline 2.8](#), 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.*

\_\_\_\_\_  
President of the University

Click here to enter a  
date.

\_\_\_\_\_  
Date

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

1. **Do you have a major in this field (place an "X" in the appropriate box)?**    
Yes No

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.**

Offering this minor is in line with our university's mission and strategic plan, which focuses on providing undergraduate engineering programs that cater to industry demands. We aim to equip our graduates with the knowledge and skills to tackle global challenges and serve as leaders by guiding them through the entire construction process, from planning and design through construction.

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

Construction engineering is a specialized branch of engineering that focuses on the planning, design, and management of construction projects. It involves applying engineering principles and techniques to oversee the construction process, ensuring that structures are built safely, efficiently, and in accordance with design specifications and regulatory requirements. This minor will provide graduates with an introduction to the field and the application of the tools and skills needed to address the problems they will encounter.

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

The minor will be a valuable asset to students, not just by equipping them with essential tools and skills, but also by signaling to prospective employers that they have received education in these crucial areas.

5. **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.**

**National Demand:** According to the U.S. Bureau of Labor Statistics (BLS), the employment of civil engineers, which includes construction engineers, is projected to grow by 8 percent from 2020 to 2030, which is faster than the average for all occupations<sup>1</sup>. This growth is attributed to the need for infrastructure improvements, such as roads, bridges, and water systems, as well as increased demand for renewable energy projects.

The construction management field is also experiencing a positive outlook. The BLS indicates a 10 percent growth in employment for construction managers from 2020 to 2030, driven by the need to oversee various construction projects<sup>2</sup>.

**South Dakota Demand:** It is projected that there will be 51 openings each year or 1% of the 3,712 total estimated annual openings in Management occupations.<sup>3</sup>

Footnote:

U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, Civil Engineers - source ↵

U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, Construction Managers - source ↵

Labor Market Information Center, SD Department of Labor & Regulation

**6. 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).**

<i>Estimates</i>	<b>Fiscal Years*</b>			
	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup></b>	<b>4<sup>th</sup></b>
	<b>FY 25</b>	<b>FY 26</b>	<b>FY 27</b>	<b>FY 28</b>
<b>Students enrolled in the minor (fall)</b>	<b>10</b>	<b>10</b>	<b>15</b>	<b>15</b>
<b>Completions by graduates</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>15</b>

\*Do not include current fiscal year.

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

In essence, our curriculum for the minor in Construction Engineering is thoughtfully designed to meet industry demands and is substantiated by professional guidance, regulatory compliance, industry standards, and the invaluable input from industry advisors, ensuring that students receive an education that's both well-rounded and attuned to the ever-evolving industry landscape. We take cues from esteemed professional associations like American Society of Civil Engineers (ASCE) and Construction Manager’s Association of America (CMAA), who offer valuable insights into industry trends and benchmarks.

**8. 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.*

**A. Distribution of Credit Hours**

<b>Construction Engineering</b>	<b>Credit Hours</b>	<b>Percent</b>
Requirements in minor	6	33.33%
Electives in minor	12	67.67%
Total	18	100%

**B. Required Courses in the Minor**

<b>Prefix</b>	<b>Number</b>	<b>Course Title</b> <i>(add or delete rows as needed)</i>	<b>Prerequisites for Course</b> <i>Include credits for prerequisites in subtotal below.</i>	<b>Credit Hours</b>	<b>New (yes, no)</b>
CEE	274	Construction & Engineering Management	CEE130/130L; (this pre-req is eligible for waiver)	3	No
CEM	410	Construction Project Management	CEE 274	3	No
Subtotal				6	

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

Prefix	Number	Course Title <i>(add or delete rows as needed)</i>	Prerequisites for Course <i>Include credits for prerequisites in subtotal below.</i>	Credit Hours	New (yes, no)
<i>Select 12 credits from the following list of electives:</i>					
CEE	316/316L	Engineering & Construction Materials w/Lab	See Note*	3	No
CEE	346/346L	Geotechnical Engineering w/Lab	See Note*	3	No
CEE	456	Concrete Theory & Design	See Note*	3	No
CEE	337	Engineering Hydrology	See Note*	3	No
CEE	327/327L	Environmental Eng II	See Note*	3	No
CEE	347/347L	Geotechnical Eng II	See Note*	3	No
CEE	468	Highway Engineering	See Note*	3	No
CEE	453	Design of Steel Structures	See Note*	3	No
CEE	451	Design of Wood Structures	See Note*	3	No
CEE	447	Foundation Engineering	See Note*	3	No
CEE	433	Open Channel Flow	See Note*	3	No
CEE	475	Groundwater	See Note*	3	No
CEE	437	Watershed Hydrology	See Note*	3	No
CEE	427	EnvE Biological Process Design	See Note*	3	No
CEE	425	Sustainable Engineering	See Note*	3	No
CEE	426	EnvE Unit Operations and Processes	See Note*	3	No
CEE	429	Solid and Haz Waste Eng	See Note*	3	No
GEOE	461	Geothermal and Production Eng	See Note*	3	No
GEOE	466/466L	Eng & Environmental Geology	See Note*	3	No
MET/ BME	232	Properties of Materials	See Note*	3	No
MET	430/430L	Welding Engineering and Design of Welded Structures	See Note*	3	No
IENG	215	Cost Estimating for Engineers	See Note*	3	No
IENG	431	Industrial Hygiene	See Note*	3	No
ME	210	Statics of Mechanisms	See Note*	3	No
ME	465	Design Thinking & Innovation	See Note*	3	No
Subtotal				12	

**\*Pre-requisites Note:** *Some or all of the following courses may be pre-requisites for the courses on the electives list: MATH 123: Calculus I, EM 214: Statics, EM 321: Mechanics of Materials, EM 331 Fluid Mechanics. Engineering degrees at South Dakota Mines require these courses (or equivalent courses), so students will complete the necessary pre-requisites as part of their major program curriculum.*

**Catalog Note:** No more than six credits from this minor may overlap with the specific required credits of a student's declared major.

- A. 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.*

Individual Student Outcome (Same as in the text of the proposal)	Program Courses that Address the Outcomes					
	EXAMPLE SPCM 101	CEE 274	CEM 410	Prefix & Number	Prefix & Number	Prefix & Number
Solid understanding of the fundamental principles and theories in construction engineering, including construction materials, methods, and technologies.		X				
Proficiency in project planning and management, encompassing skills such as scheduling, budgeting, and resource allocation for construction projects.			X			
Prepare and interpret construction documents, including drawings, specifications, and contracts, to effectively communicate project requirements.		X				
Understand the importance of health and safety in construction, including regulations and best practices to create a secure working environment.		X	X			
Demonstrate effective communication skills, both written and verbal, for collaborating with diverse stakeholders in the construction industry.			X			
Demonstrate problem-solving skills to address challenges that may arise during construction projects, and make informed decisions to overcome obstacles.			X			
Understand and adhere to professional ethics in the construction industry, considering factors like integrity, accountability, and social responsibility.		X	X			
Familiarize themselves with the latest technologies used in construction engineering, such as Building Information Modeling (BIM) and construction management software.		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.*

- 10. 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.*

A combination of Textbooks, lectures, videos followed by examples of practical application are being utilized for these courses.

### 11. 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 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)?

	Yes/No	Intended Start Date
On campus	Yes	Fall 2024

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

	Yes/No	If Yes, identify delivery methods <i>Delivery methods are defined in <a href="#">AAC Guideline 5.5</a>.</i>	Intended Start Date
Distance Delivery (online/other distance delivery methods)	No		Choose an item. Choose an item.
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 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.

12. 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

13. 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.*

No new resources will be needed to implement this proposed minor.

**14. 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*).

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.*

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.*

**15. 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.*