

SOUTH DAKOTA BOARD OF REGENTS

Academic and Student Affairs

AGENDA ITEM: 7 – C (1)

DATE: June 28-30, 2016

SUBJECT: New Program: SDSU Minor in Heavy Highway Construction

South Dakota State University (SDSU) requests authorization to offer a minor in Heavy Highway Construction. SDSU has a related major in Construction Management. The minor is designed for civil and mechanical engineering students who want additional expertise in transportation infrastructure project management. The minor will prepare students to work for firms who build roads, bridges, and utility installation projects. SDSU reports projected employment growth in road and bridge project management of 8% through 2024. SDSU expects to graduate 23 students per year with this minor after full implementation. The proposed curriculum does not require the addition of any new courses and consists of 18 credit hours. SDSU is not requesting new resources.

DRAFT MOTION 20160628_7-C(1): I move to approve SDSU’s Minor in Heavy Highway Construction as described in Attachment I.

**South Dakota Board of Regents
New Baccalaureate Degree Minor**

University:	South Dakota State University
Title of Proposed Minor:	Heavy-Highway Construction
Degree(s) in which minor may be earned:	Any
Existing related majors or minors:	Construction Management, Civil Engineering
Proposed Implementation (term):	Fall 2016
Proposed CIP Code:	52.2001

University Approval

To the Board 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.

David L. Chicoine

President of the University

April 27, 2016

Date

After approval by the President, a signed copy of the proposal should be transmitted to the Executive Director. Only after Executive Director review should the proposal be posted on the university web site and the Board staff and the other universities notified of the URL.

1. Do you have a major in this area? X Yes No

South Dakota State University (SDSU) has offered the Bachelor of Science in Construction Management since 1996. It has been fully accredited by the American Council for Construction Education (ACCE) since 2005.

2. If you do not have a major in this area, explain how the proposed minor relates to your mission.

N/A

3. How will the proposed minor benefit students?

The minor in Heavy-Highway Construction will provide students in the civil and mechanical engineering programs an opportunity to deepen their knowledge of transportation infrastructure project management. The minor will prepare students to work for firms who build roads, bridges, and utility installation projects. The national transportation infrastructure is currently in serious condition¹ requiring an estimated investment of state and federal funding of \$3.6 trillion dollars to repair and rebuild deteriorating roads and bridges. Engineers with preparation in highway-road-bridge project management is expected to grow 8% for the period 2014 – 2024². The University recognizes this issue and seeks to fill the need for professionals prepared to work in this sub-section of the construction industry: heavy-highway construction.

¹ American Society for Civil Engineers. [2013 Report Card for America's Infrastructure](#).

² Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition*, Civil Engineers. <http://www.bls.gov/ooh/architecture-and-engineering/civil-engineers.htm>

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4. Provide estimated enrollments and completions in the table below and explain how the estimates were developed.

	Fiscal Years*			
	1st	2nd	3rd	4th
Estimates	FY 2016	FY2017	FY2018	FY2019
Students in the minor (fall)	6	12	24	30
Completions by graduates	0	6	11	23

* Do not include current year.

These estimates are based on 4% of current enrollments in the Civil Engineering program as it is anticipated this will be the primary source of students for this minor.

5. What is the rationale for the curriculum?

The curriculum establishes competency in estimating, methods and systems, and project scheduling in four courses: Cost Estimating, Heavy and Highway Methods & Systems, Heavy and Highway Estimating, and Construction Planning & Scheduling. All have elements related to heavy – highway construction project development and delivery. The two remaining courses are electives whereby a student can further develop their project skills, technical knowledge in site layout (surveying, highway-traffic engineering), materials (bituminous, concrete), job site safety (risk management), and management (project supervision, law and accounting).

6. Complete the tables below. Explain any exceptions to BOR policy being requested.

A. Distribution of Credit Hours

Heavy-Highway Construction	Credit Hours	Percent
Requirements in Minor	12	66.7
Electives in the Minor	6	33.3
Total	18	100%

B. Required Courses in the Minor

Prefix	Number	Course Title	New*	Hours
CM	232	Cost Estimating	N	3
CM	374	Heavy Construction Methods and Systems	N	3
CM	443	Construction Planning & Scheduling	N	3
CM	452	Heavy & Highway Estimating	N	3
		Subtotal, required		12

* New: Y= yes, N = no.

C. Elective Courses in the Minor: List courses that may be taken as electives in the minor. Indicate any new courses to be added specifically for the minor.

Select 6 credits from the following:

Prefix	Number	Course Title	New*	Hours
CEE	208-208L	Engineering Surveys & Lab	N	3, 0
CEE	363	Highway & Traffic Engineering	N	3

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CEE	411-411L	Bituminous Materials & Lab	N	3, 0
CEE	456	Concrete Theory & Design	N	3
CM	400	Risk Management & Construction Safety	N	3
CM	410	Construction Project Management & Supervision	N	3
CM	473	Construction Law & Accounting	N	3

7. What outcomes will be expected for all students who complete the minor? How will these outcomes be achieved?

Upon completion of the minor in Heavy-Highway Construction, students will be able to:

1. Have an understanding of heavy construction methods and systems including equipment types, how used, and specialty application.
2. Apply principles of transportation project management to reduce costs, meet schedule deadlines, and deliver the project to specifications.
3. Plan production for heavy equipment projects including selecting the appropriate equipment calculating cost and loading factors.

The selected course outcomes are currently implemented within the Construction Management and Civil Engineering programs as part of core or technical elective credits. The student outcomes are measured as part of the ABET accreditation process.

8. What instructional technologies will be used to teach courses in the minor? *This refers to the instructional technologies used to teach the new courses in the minor and NOT the technology applications students are expected to learn.*

There are no new courses that will be taught in the minor. Current instructional technologies will be used. All courses are offered in traditional face-to-face classroom and lab environments on the SDSU Campus

9. Is the University is requesting authorization to provide the minor to students at an off-campus location or by distance delivery? If yes, explain. *If off-campus or distance delivery authorization is not requested, enter "None."*

None.

10. Costs, Budget & Resources: Explain the amount and source(s) of any one-time and continuing investments in personnel, professional development, release time, instructional technology and software, other O&M, facilities, etc needed to implement the minor.

All courses are currently offered on a regular basis. No additional resources are required. The minor in Heavy-Highway Construction will leverage available section capacity in the Construction Management and Civil Engineering programs.

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Appendix A
Heavy-Highway Construction Minor – Student Learning Outcomes

Individual Student Outcomes	<i>Required Coursework</i>			
	CM 232	CM 374	CM 443	CM 452
Have an understanding of heavy construction methods and systems including equipment types, how used, and specialty application.	X	X		
Apply principles of transportation project management to reduce costs, meet schedule deadlines, and deliver the project to specifications.	X		X	X
Plan production for heavy equipment projects including selecting the appropriate equipment calculating cost and loading factors.		X		X