

## SOUTH DAKOTA BOARD OF REGENTS ACADEMIC AFFAIRS FORMS

# Substantive Program Modification Form

UNIVERSITY:	SDSU					
CURRENT PROGRAM DEGREE:	Bachelor of Science (B.S.)					
<b>CURRENT PROGRAM MAJOR/MINOR:</b>	Mechanical Engineering					
CURRENT SPECIALIZATION:	Aerospace Engineering					
CIP CODE:	14.1901 – Major CIP					
	14.0201 – Specialization CIP					
UNIVERSITY DEPARTMENT:	Mechanical Engineering					
BANNER DEPARTMENT CODE:	SMEC					
UNIVERSITY COLLEGE:	Jerome J Lohr College of Engineering					
BANNER COLLEGE CODE:	3E					
<b>University Approval</b> 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.						
Dennis D. Hedge	4/24/2024					
Vice President of Academic Affair						
President of the University						
1. This modification addresses a change in:						
	e   Total credits of supportive course work					
☐ Total credits of elective course work	☐ Total credits required for program					
☐ Program name	<ul><li>Existing specialization</li></ul>					
☐ CIP Code						
☐ Modification requiring Board of Regents	-					
Must have prior approval from Executive	**					
2. Effective date of change: 2024-2025 Acade						
3. Program Degree Level:						
Associate □ Bachelor's ⊠	Master's □ Doctoral □					
4. Category:						
Certificate ☐ Specialization ⊠	Minor □ Major □					
5. If a name change is proposed, the change v	vill occur:					
☐ On the effective date for all students						
$\Box$ On the effective date for students new to	the program (enrolled students will graduate from					
existing program)						
Proposed new name:						
6. Is the program being modified associated v	vith a current articulation agreement?					
Yes ⊠ No □	_					

a. If yes, will the articulation agreement need to be updated with the partner

### institution following the approve of the program change? Please explain:

Minnesota West Community and Technical College

# 7. Primary Aspects of the Modification: Existing Curriculum

Existing Curriculum Proposed Curriculum (highlight changes)

SGR #1   3   SGR #1   3   SGR #1   SGR #1   SGR #2   3   SGR #2   SGR #2   SGR #3   SGR #2   SGR #3   SGR #4   SGR #5   CHEM 1122   General Chemistry (SGR #6)   4 MATH 123   Calculus I (SGR #5)   CHEM 1122   General Chemistry (SGR #6)   1 CHEM 1122   General Chemistry (SGR #6)   Supporting Coursework   43 Supporting Coursework   43 Supporting Coursework   43 Supporting Coursework   44 Supporting Coursework   45 Supporting Coursework   45 Supporting Coursework   46 Supporting Coursework   47 Supporting Coursework   48 Supporting Coursework   50 SGR #6   Supporting Coursework   50 S	33 18	Title	Pref.	Cr. Hrs.	Title	Num.		
SGR #1   3   SGR #1   3   SGR #1   SGR #1   SGR #2   3   SGR #2   SGR #2   SGR #3   SGR #2   SGR #3   SGR #4   SGR #5   CHEM 1122   General Chemistry (SGR #6)   4 MATH 123   Calculus I (SGR #5)   CHEM 1122   General Chemistry (SGR #6)   1 CHEM 1122   General Chemistry (SGR #6)   Supporting Coursework	18	Systems General Education Requirements						
SGR #1   3   SGR #2   SGR #3   SGR #2   SGR #3   SGR #3   SGR #3   SGR #3   SGR #3   SGR #3   SGR #4   SGR #5   Section Requirements - Require ECON 201   Principles of Microeconomics (SGR #3 )		al Education Requirements - Electives	<b>Systems General Education Requirements - Electives</b>					
SGR #2   3   SGR #3   SGR #3   SGR #3   SGR #4   3   SGR #4   3   SGR #4   SGR #4   3   SGR #4   SGR #4   3   SGR #4   SGR #5   SGR #4   MATH 123   Calculus I (SGR #5)   4   MATH 123   Calculus I (SGR #5)   CHEM 112   General Chemistry (SGR #6)   3   CHEM 112   General Chemistry (SGR #6)   CHEM 112   General Chemistry (SGR #6)   SGR #6   SGR	3							
SGR #3   SGR #4   3   SGR #4   SGR #5   SGR #4   SGR #5   SGR #4   SGR #5   SGR #6   SGR #3   SGR #4   SGR #5   SGR #6   SGR #3   SGR #4   SGR #5   SGR #6   SGR #5   SGR #6   SGR #6	3							
SGR #4   3   SGR #4   3   SGR #4   SGR #5   SGR #4   SGR #3   3   ECON   201   Principles of Microeconomics (SGR #3   SGR #5   SGR #1   123   Calculus I (SGR #5   Calculus I (SGR #5   Calculus I (SGR #5   Calculus I (SGR #6   CHEM   112   General Chemistry (SGR #6   CHEM   112   General Chemistry (SGR #6   CHEM   112   General Chemistry Lab (SGR #6   CHEM   112   General Chemistry Lab (SGR #6   CHEM   SUPPORT   SUPPORT	3							
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	<b>57</b>	u i			Major Requirements			
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ME 121 Production and Fabrication Processes 1 ME 121 Production and Fabrication Processes	1	Production and Fabrication Processes	ИE	1	Production and Fabrication Processes	121	ME	
ME 121L Production and Fabrication Processes Lab 1 ME 121L Production and Fabrication Processes I	b 1	Production and Fabrication Processes Lab	ИE	1	Production and Fabrication Processes Lab	121L	ME	
ME 212 Mechanical Engineering Design 1 ME 212 Mechanical Engineering Design	2		ИΕ	1	Mechanical Engineering Design	212	ME	
Technologies Technologies		Technologies						
ME 212L Mechanical Engineering Design 1 ME 212L Mechanical Engineering Design	<del>1</del>		<del>Æ</del>	1	Mechanical Engineering Design	212L	ME	
Technologies Lab Technologies Lab		8						
ME 230 Engineering Design Methods 2 ME 230 Engineering Design Methods	3	• •			Engineering Design Methods	230	ME	
ME 241 Engineering Materials 3 ME 241 Engineering Materials	3	Engineering Materials	ΛE	3	Engineering Materials	241	ME	
ME 301 Engineering Ethics and Economics	1	Engineering Ethics and Economics	<mark>ЛЕ</mark>					
ME 311 Thermodynamics I 3 ME 311 Thermodynamics I	3	Thermodynamics I	ИΕ	3		311	ME	
ME 312 Thermodynamics II 3 ME 312 Thermodynamics II	3	Thermodynamics II		3	Thermodynamics II	312	ME	
	3	Fundamentals of Machine Design	ИΕ	3	Fundamentals of Machine Design	321	ME	

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ME   376   Measurements and Instrumentation   2	Pref.	Num.				Num.	Title	Cr. Hrs.
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Proposed Curriculum (highlight changes)

#### **Academic Requirements**

#### Current:

- A combined average of "C" or better in the mechanical engineering courses.
- A combined average of "C" or better in the mathematics courses.

Existing Curriculum

- A minimum grade of "C" in each of the following courses: MATH 123, MATH 125, PHYS 211, ME 311, ME 312, and all EM designated courses
- Students who fail to earn a "C" or better in any of these courses, will be required to repeat them in each subsequent semester until the requirement is met.

#### Proposed:

- A combined average of "C" or better in the mechanical engineering courses.
- A combined average of "C" or better in the mathematics courses.
- A minimum grade of "C" in each of the following courses: MATH 123, MATH 125, PHYS 207, ME 311, ME 312, and all EM designated courses
- Students who fail to earn a "C" or better in any of these courses, will be required to repeat them in each subsequent semester until the requirement is met.

#### 8. Explanation of the Change:

The Department of Mechanical Engineering reviewed the Mechanical Engineering major. The following changes were identified:

- Updated existing lab courses ME 376 Measurements and Instrumentation, ME 452 Dynamic Systems Lab, and ME 476 Thermo-Fluids Lab, and added a new lab, ME 377 Thermodynamics and Fluid Mechanics Lab, so that there are four 1 credit lab courses to enhance students' lab experience and foster hands-on skills relevant to the current industry practices. ME 376 Measurements and Instrumentation has been reduced from 2 to 1 credit and renamed to Measurements and Materials Characterization. The measurements and instruments used in ME 376 will be updated with new equipment and the new title reflects the emphasis on characterizing materials that the original title does not. ME 452 Dynamics Systems Lab changed titles to Mechatronics and Vibrations Lab which reflects the modern name of automated control systems as well as the dynamic nature of moving parts which can lead to vibrations. ME 476 Thermo Fluids Lab was renamed Machine Components and Heat Transfer Lab which reflects the components affected by thermal fluids more than the thermal fluids themselves. ME 377 Thermodynamics and Fluid Mechanics Lab (1 cr.) will be a new lab focused on the nature of heat flow and the experimental techniques used to measure heat and temperature. In ME 377 students will apply the theory taught in corequisite courses ME 311 Thermodynamics and EM 331 Fluid Mechanics.
- Removed GE 231 Technology, Society, and Ethics (3 cr.) based upon the feedback from student surveys indicating that GE 231 was not perceived as highly beneficial and results from the Fundamental of Engineering Exam. Students are not retaining or able to apply the content on ethics in the desired manner. Ethics content is moved to a new course, ME 301 Engineering Economics and Ethics (1 cr.). This new course will be a combination of two required topics that are linked and would be offered with content that simultaneously develops students' ability to make complex ethical decisions that are impacted by financial decisions that are part of the design process.
- Increased ME 212 Mechanical Engineering Design Technologies from 1 to 2 credits and deleted ME 212L Mechanical Engineering Design Technologies Lab (1 cr.). The laboratory component for ME 212 was part of the original course to cover the software being used. The lab needed the software to be taught in an existing computer lab with limited seating. Changes in software being used, licensing and availability have allowed the teaching of software in the lecture portion of the course and no longer requires scheduling in the computer lab.
- Increased ME 230 Engineering Design Methods from 2 to 3 credits to reflect the level of instruction and student work more accurately for this course.
- Increased ME 478 Mechanical Systems Design I and ME 479 Mechanical Systems Design II from 2 to 3 credits to reflect the level of instruction and student work more accurately for these courses and deleted ME 479L Mechanical Systems Design II Lab (0 cr.) and ME 490 Seminar (1 cr.).