SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

Substantive Program Modification Form

UNIVERSITY:	**SDSU**
CURRENT PROGRAM DEGREE:	**Bachelor of Science (B.S.)**
CURRENT PROGRAM MAJOR/MINOR:	**Data Science**
CURRENT SPECIALIZATION:	**N/A**
CIP CODE:	**30.7001**
UNIVERSITY DEPARTMENT:	**Department of Mathematics & Statistics**
BANNER DEPARTMENT CODE:	**SMAS**
UNIVERSITY COLLEGE:	**Jerome J Lohr College of Engineering**
BANNER COLLEGE CODE:	**3E**

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.

Dennis D. Hedge — Vice President of Academic Affairs or President of the University

4/16/2025 — Date

1. **This modification addresses a change in:**
   - ☒ Total credits required within the discipline
   - ☒ Total credits of elective course work
   - ☐ Program name
   - ☐ CIP Code
   - ☐ Modification requiring Board of Regents approval
     Must have prior approval from Executive Director or designee
   - ☐ Total credits of supportive course work
   - ☐ Total credits required for program
   - ☐ Existing specialization
   - ☐ Other (explain below)
2. **Effective date of change: 2025-2026 Academic Year**
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 will occur:**
   ☐ On the effective date for all students
   ☐ 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 with 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:**

7. Primary Aspects of the Modification:

Existing Curriculum				Proposed Curriculum (Highlight Changes)			
Pref	Num	Title	Cr Hrs	Pref	Num	Title	Cr Hrs
System General Education Requirements			**31**	**System General Education Requirements**			**27**
System General Education Requirements - Electives			**27**	**System General Education Requirements - Electives**			**27**
		SGR 1 Written Communication	3			SGR 1 Written Communication	3
		SGR 1 Written Communication	3			SGR 1 Written Communication	3
		SGR 2 Oral Communication	3			SGR 2 Oral Communication	3
		SGR 3 Social Sciences	3			SGR 3 Social Sciences	3
		SGR 3 Social Sciences	3			SGR 3 Social Sciences	3
		SGR 4 Arts and Humanities	3			SGR 4 Arts and Humanities	3
		SGR 4 Arts and Humanities	3			SGR 4 Arts and Humanities	3
		SGR 6 Natural Sciences	3			SGR 6 Natural Sciences	3
		SGR 6 Natural Sciences	3			SGR 6 Natural Sciences	3
System General Education Requirements – Required			**4**	**System General Education Requirements – Required**			**--**
MATH	123	Calculus I (SGR 5)	4	MATH	123	Calculus I (SGR 5) (Major Requirements)	--
Major Requirements			**49**	**Major Requirements**			**55**
				CSS	401	Data Science Capstone	3
MATH	123	Calculus I (SGR 5)	--	MATH	123	Calculus I (SGR 5)	4
MATH	125	Calculus II	4	MATH	125	Calculus II	4
MATH	198	The Mathematic Profession	1	MATH	198	Mathematics Profession I	1
MATH	225	Calculus III	4	MATH	225	Calculus III	4
MATH	230	Sophomore Seminar	1	~~MATH~~	~~230~~	~~Sophomore Seminar~~	~~1~~
MATH	250	Introduction to Linear Algebra and Proof	3	~~MATH~~	~~250~~	~~Introduction to Linear Algebra and Proof~~	~~3~~
MATH	253	Logic Sets and Proof	4	~~MATH~~	~~253~~	~~Logic Sets and Proof~~	~~4~~
				MATH	270	Computational Linear Algebra	3
				MATH	316	Discrete Math	3
				MATH	374	Scientific Computation	3
MATH	401	Senior Capstone	2	~~MATH~~	~~401~~	~~Senior Capstone~~	~~2~~
STAT	382	Probability	3	STAT	382	Probability	3
STAT	482	Mathematical Statistics	3	STAT	482	Mathematical Statistics	3
Select 24 credits from the following			24	Select 24 credits from the following			24
CSC	250	Computer Science II	3	CSC	250	Computer Science II	3
CSC	300	Data Structures	3	CSC	300	Data Structures	3
CSC	319	Parallel Computing	3	CSC	319	Parallel Computing	3
				CSC	447	Artificial Intelligence	3
MATH	316	Discrete Math	3	~~MATH~~	~~316~~	~~Discrete Math~~	~~3~~
				MATH	321	Differential Equations	3
				MATH	331	Engineering Mathematics	3
MATH	374	Scientific Computation	3	~~MATH~~	~~374~~	~~Scientific Computation~~	~~3~~
				MATH	471	Numerical Analysis	3
MATH	475	Operations Research	3	MATH	475	Operations Research	3
STAT	101	Introduction to Data Science	3	STAT	101	Introduction to Data Science	3
STAT	383	Geospatial Data Analysis	3	STAT	383	Geospatial Data Analysis	3
STAT	410	SAS Programming	3	STAT	410	SAS Programming	3
STAT	415	R Programming	3	STAT	415	R Programming	3
STAT	441	Statistical Methods II	3	STAT	441	Statistical Methods II	3
STAT	442	Exploratory Data Analysis	3	STAT	442	Exploratory Data Analysis	3
STAT	445	Nonparametric Statistics	3	STAT	445	Nonparametric Statistics	3
STAT	451	Predictive Analytics I	3	STAT	451	Predictive Analytics I	3
STAT	453	Applied Bayesian Statistics	3	STAT	453	Applied Bayesian Statistics	3
				STAT	454	Statistical Machine Learning and AI	3
STAT	460	Time Series Analysis	3	STAT	460	Time Series Analysis	3
Supporting Coursework			**3**	**Supporting Coursework**			**3**
CSC	150	Computer Science I	3	CSC	150	Intro to Computer Science (3)	3

Existing Curriculum				Proposed Curriculum (Highlight Changes)			
Pref	Num	Title	Cr Hrs	Pref	Num	Title	Cr Hrs
OR INFO	101	Introduction to Informatics (3)		OR INFO	101	Introduction to Informatics (3)	
Electives			**36**	**Electives**			**35**
Summary of Credits for Data Science (B.S.)							
System General Education Requirements			**31**	**System General Education Requirements**			**27**
Major Requirements			**49**	**Major Requirements**			**55**
Supporting Coursework			**3**	**Supporting Coursework**			**3**
Electives			**36**	**Electives**			**35**
Total number of hours required for major			**56**	**Total number of hours required for major**			**58**
Total number of hours required for degree			**120**	**Total number of hours required for degree**			**120**

8. Explanation of the Change:

The Department of Mathematics and Statistics has identified the following changes to the Data Science major:

- MATH 250 Introduction to Linear Algebra was replaced by MATH 270 Computational Linear Algebra. MATH 250 is intended to prepare students to write proofs and learn basic information about linear algebra. The course is focused on mathematics concepts and skills. MATH 270 is focused on computational linear algebra, which will emphasize learning the computational techniques used to work with linear equations. MATH 270 is more appropriate for this program.
- MATH 316 Discrete Math has been realigned from the technical elective list to the major requirements and replaced MATH 253 Logic, Sets and Proof. MATH 253 is a proof intensive course and advanced proofs are not required in applied data science. Instead, students will take MATH 316 which will give them the basics of proofs needed for their field of study and for data computations.
- The program had a two-semester MATH 401 Senior Capstone, which was repeatable. This has caused some confusion regarding how it contributes to graduation requirements. To clarify, the department is creating a new capstone course, CSS 401 Data Science Capstone which will replace MATH 230 Sophomore Seminar and MATH 401 Senior Capstone. This course will be project based with faculty mentoring students.
- MATH 374 Scientific Computation has been moved from the technical elective list to the major requirements. This course provides students with programming proficiency essential for data science.
- MATH 321 Differential Equations, MATH 331 Engineering Mathematics, MATH 471 Numerical Analysis, STAT 454 Statistical Machine Learning and AI, and CSC 447 Artificial Intelligence were added to the technical elective list to broaden the computational mathematics and computer science options for Data Science students.