



SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS
Substantive Program Modification Form

UNIVERSITY:	USD
CURRENT PROGRAM TITLE:	Computer Science, B.A./B.S.
CIP CODE:	11.0101
UNIVERSITY DEPARTMENT:	Computer Science
BANNER DEPARTMENT CODE:	UCSC
UNIVERSITY DIVISION:	Arts & Sciences
BANNER DIVISION CODE:	UAS

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

3/23/2020

 Vice President of Academic Affairs or
 President of the University

 Date

1. This modification addresses a change in (place an "X" in the appropriate box):

- | | |
|---|--|
| <input type="checkbox"/> Total credits required within the discipline | <input type="checkbox"/> Total credits of supportive course work |
| <input type="checkbox"/> Total credits of elective course work | <input checked="" type="checkbox"/> Total credits required for program |
| <input type="checkbox"/> Program name | <input type="checkbox"/> Existing specialization |
| <input type="checkbox"/> CIP Code | <input checked="" type="checkbox"/> Other (explain below)
Create Specialization |

2. Effective date of change: 8/24/2021

3. Program Degree Level (place an "X" in the appropriate box):

Associate Bachelor's Master's Ed. Specialist Doctoral

4. Category (place an "X" in the appropriate box):

Certificate Specialization Minor Major

5. If a name change is proposed, the change will occur (place an "X" in the appropriate box):

- 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: B.A./B.S. Computer Science, Artificial Intelligence Specialization

Reminder: Name changes may require updating related articulation agreements, site approvals, etc.

6. Primary Aspects of the Modification (add lines or adjust cell size as needed):

Existing Curriculum

Proposed Curriculum (highlight changes)

Pref.	Num.	Title	Cr. Hrs.	Pref.	Num.	Title	Cr. Hrs.
Bachelor of Arts (B.A.), Computer Science: Total 50 credit hours*				Bachelor of Arts (B.A.), Computer Science: Total 50 credit hours*			
Major Area Core Coursework				Major Area Core Coursework			
Department requirements (19 credit hours)				Department requirements (19 credit hours)			
CSC	155	Introduction to Computer Science & Programming	4	CSC	155	Introduction to Computer Science & Programming	4
CSC	155L	Introduction to Computer Science & Programming Laboratory	0	CSC	155L	Introduction to Computer Science & Programming Laboratory	0
CSC	255	Intermediate Computer Programming	4	CSC	255	Intermediate Computer Programming	4
CSC	255L	Intermediate Computer Programming Laboratory	0	CSC	255L	Intermediate Computer Programming Laboratory	0
CSC	324	Machine Organization	4	CSC	324	Machine Organization	4
CSC	324L	Machine Organization Laboratory	0	CSC	324L	Machine Organization Laboratory	0
CSC	350	Algorithms & Data Structure	4	CSC	350	Algorithms & Data Structure	4
CSC	480	Capstone: Software Engineering	3	CSC	480	Capstone: Software Engineering	3
			Subtotal:				19
Non-departmental Requirements (7 hours)				Non-departmental Requirements (7 hours)			
MATH	121	Survey of Calculus	4	MATH	121	Survey of Calculus	4
MATH	216	Discrete Structures	3	MATH	216	Discrete Structures	3
			Subtotal:				7
Departmental Electives (24 hours), select 24 credit hours				Departmental Electives (24 hours)			
CSC	380	Information retrieval and Analysis	3	CSC	380	Information retrieval and Analysis	3
CSC	408	Social, Ethical, and Legal Aspects of Computing	3	CSC	408	Social, Ethical, and Legal Aspects of Computing	3
CSC	411	Simulation	3	CSC	411	Simulation	3
CSC	425	High Performance Computing	3	CSC	425	High Performance Computing	3
CSC	433	Computer Graphics	3	CSC	433	Computer Graphics	3
CSC	435	Human Factors in Computer Systems	3	CSC	435	Human Factors in Computer Systems	3
CSC	447	Artificial Intelligence	3	CSC	447	Artificial Intelligence	3
CSC	453	Theory and Systems Fundamentals	3	CSC	453	Theory and Systems Fundamentals	3
CSC	456	Operating Systems	3	CSC	456	Operating Systems	3
CSC	461	Programming Languages	3	CSC	461	Programming Languages	3
CSC	462	Computer Networks and Security	3	CSC	462	Computer Networks and Security	3
CSC	471	Numerical Analysis I	3	CSC	471	Numerical Analysis I	3
CSC	475	Operation Research	3	CSC	475	Operation Research	3
CSC	481	System Analysis	3	CSC	481	System Analysis	3
				CSC	486	Data Mining	3
				CSC	488	Pattern Recognition and Machine Learning	3
CSC	491	Topics	3	CSC	491	Topics	3
CSC	494	Internship	3	CSC	494	Internship	3
			Total				50
B.A., Artificial Intelligence Specialization				B.A., Artificial Intelligence Specialization			
Select 12 credit hours from the following courses:				Select 12 credit hours from the following courses:			
CSC	380	Information Retrieval and Analysis (*B.S.)	3	CSC	380	Information Retrieval and Analysis (*B.S.)	3
CSC	425	High Performance Computing	3	CSC	425	High Performance Computing	3
CSC	447	Artificial Intelligence	3	CSC	447	Artificial Intelligence	3
CSC	486	Data Mining	3	CSC	486	Data Mining	3
CSC	488	Pattern Recognition and Machine Learning	3	CSC	488	Pattern Recognition and Machine Learning	3
Select 3 credit hours from the following courses:				Select 3 credit hours from the following courses:			
STAT	480	Applied Statistics	3	STAT	480	Applied Statistics	3
STAT	481	Probability and Statistics	3	STAT	481	Probability and Statistics	3
			Subtotal				15
Departmental Electives				Departmental Electives			
select 19 hours from the following:				select 19 hours from the following:			
CSC	408	Social, Ethical, and Legal Aspects of Computing	3	CSC	408	Social, Ethical, and Legal Aspects of Computing	3
CSC	411	Simulation	3	CSC	411	Simulation	3
CSC	433	Computer Graphics	3	CSC	433	Computer Graphics	3
CSC	435	Human Factors in Computer Systems	3	CSC	435	Human Factors in Computer Systems	3
CSC	453	Theory and Systems Fundamentals	3	CSC	453	Theory and Systems Fundamentals	3
CSC	456	Operating Systems	3	CSC	456	Operating Systems	3
CSC	461	Programming Languages	3	CSC	461	Programming Languages	3

				CSC	462	Computer Networks and Security	3
				CSC	471	Numerical Analysis I	3
				CSC	475	Operation Research	3
				CSC	481	System Analysis	3
				CSC	491	Topics	1-5
				CSC	494	Internship	1-8
						Total	50
Bachelor of Science (B.S.), Computer Science: Total 62 credit hours*				Bachelor of Science (B.S.), Computer Science: Total 62 credit hours*			
Major Area Core Coursework				Major Area Core Coursework			
Department Requirements (32 credit hours)				Department Requirements (32 credit hours)			
CSC	155	Introduction to Computer Science & Programming	4	CSC	155	Introduction to Computer Science & Programming	4
CSC	155L	Introduction to Computer Science & Programming Laboratory	0	CSC	155L	Introduction to Computer Science & Programming Laboratory	0
CSC	255	Intermediate Computer Programming	4	CSC	255	Intermediate Computer Programming	4
CSC	255L	Intermediate Computer Programming Laboratory	0	CSC	255L	Intermediate Computer Programming Laboratory	0
CSC	324	Machine Organization	4	CSC	324	Machine Organization	4
CSC	324L	Machine Organization Laboratory	0	CSC	324L	Machine Organization Laboratory	0
CSC	350	Algorithms & Data Structure	4	CSC	350	Algorithms & Data Structure	4
CSC	380	Information retrieval and Analysis	3	CSC	380	Information retrieval and Analysis	3
CSC	408	Social, Ethical, and Legal Aspects of Computing	1	CSC	408	Social, Ethical, and Legal Aspects of Computing	1
CSC	453	Theory and Systems Fundamentals	3	CSC	453	Theory and Systems Fundamentals	3
CSC	456	Operating Systems	3	CSC	456	Operating Systems	3
CSC	462	Computer Networks and Security	3	CSC	462	Computer Networks and Security	3
CSC	480	Capstone: Software Engineering	3	CSC	480	Capstone: Software Engineering	3
		Subtotal:	32			Subtotal:	32
Departmental Electives (11 hours), select 11 credit hours				Departmental Electives (11 hours), select 11 credit hours			
CSC	401	Rich Internet Applications	3	CSC	401	Rich Internet Applications	3
CSC	411	Simulation	3	CSC	411	Simulation	3
CSC	425	High Performance Computing	3	CSC	425	High Performance Computing	3
CSC	433	Computer Graphics	3	CSC	433	Computer Graphics	3
CSC	435	Human Factors in Computer Systems	3	CSC	435	Human Factors in Computer Systems	3
CSC	447	Artificial Intelligence	3	CSC	447	Artificial Intelligence	3
CSC	461	Programming Languages	3	CSC	461	Programming Languages	3
CSC	471	Numerical Analysis I	3	CSC	471	Numerical Analysis I	3
CSC	475	Operation Research	3	CSC	475	Operation Research	3
CSC	481	System Analysis	3	CSC	481	System Analysis	3
CSC	492	Topics	3	CSC	492	Topics	1-5
CSC	494	Internship	3	CSC	494	Internship	1-8
		Subtotal:	11			Subtotal:	11
Non-Departmental Requirements (19 credit hours)				Non-Departmental Requirements (19 credit hours) (No specialization only)			
MATH	123	Calculus I	5	MATH	123	Calculus I	5
MATH	125	Calculus II	4	MATH	125	Calculus II	4
MATH	125L	Calculus II Laboratory	1	MATH	125L	Calculus II Laboratory	1
MATH	216	Discrete Structures	3	MATH	216	Discrete Structures	3
MATH	481	Probability and Statistics	3	MATH	481	Probability and Statistics	3
		or				or	
STAT	281	Introduction to Statistics	3	STAT	281	Introduction to Statistics	3
One of the following courses with the lab portions: BIOL151/L, BIOL153/L, CHEM 112/L, CHEM 114/L, ESCI 101/L, ESCI103/L, PHYS 211/L, or PHYS 213/L. (3 credit hours required)			3	One of the following courses with the lab portions: BIOL151/L, BIOL153/L, CHEM 112/L, CHEM 114/L, ESCI 101/L, ESCI103/L, PHYS 211/L, or PHYS 213/L. (3 credit hours required)			3
		Subtotal:	19			Subtotal:	19
		Total:	62			Total:	62
B.S., Artificial Intelligence Specialization (12 credit hours)				B.S., Artificial Intelligence Specialization (12 credit hours)			
CSC	425	High Performance Computing	3	CSC	425	High Performance Computing	3
CSC	447	Artificial Intelligence	3	CSC	447	Artificial Intelligence	3
CSC	486	Data Mining	3	CSC	486	Data Mining	3
CSC	488	Pattern Recognition and Machine Learning	3	CSC	488	Pattern Recognition and Machine Learning	3
		Subtotal	12			Subtotal	12

			Non-Departmental Requirements (19 credit hours)	
			MATH 123 Calculus I	5
			MATH 125 Calculus II	4
			MATH 125L Calculus II Laboratory	1
			MATH 216 Discrete Structures	3
			Select 3 credit hours from the following courses:	
			STAT 480 Applied Statistics	3
			STAT 481 Probability and Statistics	3
			One of the following courses with the lab portions: BIOL151/L, BIOL 153/L, CHEM 112/L, CHEM 114/L, ESCI 101/L, ESCI103/L, PHYS 211/L, or PHYS 213/L. (3 credit hours required)	3
			Subtotal:	19
			Total	63
			Total number of hours required for completion of major	50 - 63
			Total number of hours required for completion of degree	120
			* Course counts towards core coursework.	
			No credit will be granted on the Program of Study for a core course with a grade of 'C' or lower.	

7. Explanation of the Change:

The Department of Computer Science proposes the addition of a specialization in Artificial Intelligence (submitted with this request). The B.A./B.S. specialization will utilize new and existing coursework within the current Computer Science undergraduate curriculum. Artificial Intelligence is one of the most vital and fast-growing fields within Computer Science, with impact in every stratum of society. As such, providing expanded programs in Artificial Intelligence will help prepare current and future USD students to meet workforce needs in the state, region, and beyond.