

ACADEMIC AFFAIRS COUNCIL

AGENDA ITEM: 3.A.2

DATE: July 26, 2010

SUBJECT: Program Modifications - SDSU

South Dakota State University has submitted a program modification for the PhD in Computational Science and Statistics. (Attachment I) This request is on the July COPS agenda.

RECOMMENDED ACTION

Informational.

South Dakota Board of Regents

EXISTING PROGRAM: SUBSTANTIVE PROGRAM MODIFICATION

This form is used to request substantive changes in already existing programs (majors, minors, specializations).

1. INSTITUTION: South Dakota State University

2. CURRENT PROGRAM NAME: Ph.D. in Computational Science and Statistics

3. THIS PROPOSAL DEALS WITH A CHANGE IN:

Distribution of Credits

<input type="checkbox"/> total credits required within the discipline	<input type="checkbox"/> Program name
<input type="checkbox"/> total credits of supportive course work	<input type="checkbox"/> Existing specialization
<input type="checkbox"/> total credits of elective course work	<input type="checkbox"/> Addition of specialization
<input type="checkbox"/> total credits required for program	<input checked="" type="checkbox"/> Other: Change in required courses

4. LEVEL:

Certificate
 Associate Degree
 Bachelor's Degree
 Master's Degree
 Doctoral Degree

5. CATEGORY:

Minor
 Major
 Specialization

6. EFFECTIVE DATE OF CHANGE: Fall 2010

7. IF A NAME CHANGE IS PROPOSED, THIS 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)*

*It is requested that current students be allowed to optionally change to the new program.

8. PRIMARY ASPECTS OF THE MODIFICATION:

Existing Curriculum

Proposed Curriculum (Highlight Changes)

Current Program Name:

Proposed Program Name:

Ph.D. in Computational Science and Statistics

Ph.D. in Computational Science and Statistics

Pre	Num	Title	Cr Hrs	Pre	Num	Title	Cr Hrs
Background preparation electives			0-9	Pass qualifying exams over emphasis-area-specific preparatory courses (See Appendix A)			0-12
Required Courses				Required Courses			
CSS	701	Methods of Applied Mathematics	3	Take two emphasis-area-specific courses (See Appendix A)			6
CSS	702	Elements of Computational Science	3				
CSS	703	Statistical Modeling and Computing	3				
CSS	704	Computing Paradigms	3				
CSS	890	Seminar in CSS	3	CSS	890	Seminar in CSS	3
Dissertation Support Electives			9-12	Dissertation Support Electives			6-12
CSS	898	Dissertation	24-36	CSS	898	Dissertation	27-45

Total number of hours required for major, minor, or specialization **60**

Total number of hours required for major, minor, or specialization **60**

Total number of hours required for degree **60**

Total number of hours required for degree **60**

9. EXPLANATION OF THE CHANGE:

USD recently decided to terminate its portion of the CSS PhD program effective FY11. SDSU requests permission to respond to this change by creating three emphasis areas in Computational Science, Statistics, and Bioinformatics. In each emphasis area, the degree of quantitative rigor and specificity of the curriculum would be substantially increased relative to the previously prescribed common SDSU/USD curriculum. Additionally, the option to depart from recommended emphasis area curricula to construct a student-specific curriculum suited to the needs of a particular area of research would be retained.

Proposed curriculum changes

Proposed curriculum changes as detailed in the table above fall into four categories.

- Increase the extent and degree of quantitative rigor of expected preparation for PhD coursework and research, allowing for a more rigorous overall program.
- Increase the rigor and specificity of required courses, and decrease the number of credits.
- Make a minor change in the number of credits of elective courses.
- Increase in number of dissertation credits, resulting in more research-intensive curriculum

Institutional Authorization (President or Designee)

Date

Submitted

Proposed SDSU CSS PhD Emphasis-Area-Specific Preparatory Sequence Qualifying Exams and Required Courses

	Pass qualifying exams in these areas*	Required courses
Computational Science Emphasis Area	<ul style="list-style-type: none"> • Choose two of the following three • MATH 531 & 631 Partial Dif. Eq. & Ordinary Dif. Eq. • MATH 571 & 671 Numerical Analysis I & II 	<ul style="list-style-type: none"> • MATH 674 Advanced Scientific Computation • MATH 726 Real Variables I
Statistics Emphasis Area	<ul style="list-style-type: none"> • STAT 687 & 787 Regression Analysis I & II • STAT 685 & 785 Statistical Inference I & II 	<ul style="list-style-type: none"> • STAT 615 Multivariate Statistics • CSS 703 Statistical Computing
Bioinformatics Emphasis Area	<ul style="list-style-type: none"> • MATH 559 Bioinformatics • MATH 571 Numerical Analysis I • STAT 541 Statistical Methods II 	<ul style="list-style-type: none"> • STAT 687 Regression Analysis I • CSS 703 Statistical Computing

*Students progressing to the SDSU CSS PhD program from the SDSU MS Mathematics or SDSU MS Statistics programs will have passed these qualifying exams in the process of satisfying their MS Mathematics or MS Statistics graduation requirements.