



**SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS**

New Specialization

UNIVERSITY:	USD
TITLE OF PROPOSED SPECIALIZATION:	Integrative Biology
NAME OF DEGREE PROGRAM IN WHICH SPECIALIZATION IS OFFERED:	Biological Sciences, Ph.D.
INTENDED DATE OF IMPLEMENTATION:	8/22/2017
PROPOSED CIP CODE:	26.0101
UNIVERSITY DEPARTMENT:	Biology
UNIVERSITY DIVISION:	Arts & Sciences

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

3/20/17

Institutional Approval Signature

Date

President or Chief Academic Officer of the University

1. Level of the Specialization (place an "X" in the appropriate box):

Baccalaureate Master's Doctoral

2. What is the nature/purpose of the proposed specialization?

The addition of a specialization in Integrative Biology to the Ph.D. in Biological Sciences will reflect an area of student interest within the Department of Biology and the job market for Biology positions in academia. Integrative Biology is a discipline that stresses the study of biological systems from diverse perspectives and at diverse levels of organization. Integrative biological studies emphasize multidisciplinary approaches to answer questions about the structure and function of organisms. For example, integrative biologists may study organisms at the cellular and molecular levels to understand how these influence organismal physiology, behavior, ecology, and evolution. As biologists have found new conceptual insights through use of these systems approaches, many new degree programs and departments of integrative biology have been created to train students in this approach. Moreover, funding agencies have increasingly emphasized an integrative approach to the study of biology, exemplified by the creation of an Integrative Organismal Systems Division within the Biological Directorate at the National Science Foundation.

3. Provide a justification for the specialization, including the potential benefits to students and potential workforce demand for those who graduate with the credential.¹

¹ For workforce related information, please provide data and examples; data sources may include but are not limited to the South Dakota Department of Labor, the US Bureau of Labor Statistics, Regental system dashboards, etc.

Our Specialization within the PhD in Biological Sciences will train students to adopt this integrative perspective that includes study at multiple levels of biological organization. Graduates of this program will be well-trained to pursue research and funding in the area of complex biological systems within academic settings. Graduates of our program will be able to market themselves accurately to prospective employers who seek scientists trained to consider complex biological systems. The U.S. Bureau of Labor Statistics does not have an exact fit for labor statistics for this field of study. However, zoologists and other wildlife biologists do have a 4% growth over the next 8 years.² The Society for Integrative and Comparative Biology³ has had significant growth over the last several years. Academic positions across the country in Biology are looking for Integrative Biologist. The last three hires in Biology at University of South Dakota were Integrative Biologists.

4. List the proposed curriculum for the specialization (including the requirements for completing the major – highlight courses in the specialization):

Biology, Ph.D. , Bioinformatics Specialization				
Prefix	Num	Course Title	Cr Hrs	New
Core Curriculum				
BIOL	5xx 6xx 7xx	Biology courses to include: <ul style="list-style-type: none"> • BIOL 890 Graduate Seminar in Biology: 4-5 cr. ^ • BIOL/NSCI 792 Topics in Biology: 2+ cr. with a minimum of two different one cr. courses • BIOL 792 Topics in Biology (should be on a theme related to bioinformatics, computational biology, genomics, or systems biology): 2+ cr. • BIOL 898 Dissertation Research in Biology: 24-40 cr. • Select Optional Specialization (Bioinformatics, Neuroscience, or Integrative Biology): 15-16 cr. 	60	No
Supporting courses approved by advisory committee			0-12	
<p>^No more than 5 cr hrs. of BIOL 890 will count toward the program of study.</p> <ul style="list-style-type: none"> • NSCI 792/other topics courses will fulfill the four course topics requirement. Courses taken under a different prefix will be considered supporting coursework and will not count toward the required 60 credit hours of BIOL courses. • 50% of the program of study must be at the 700-level or above. • Up to 18 credit hours from a previous master’s degree can be applied towards Biology or supporting courses. 				
Total Core			60	

² <https://www.bls.gov/ooh/life-physical-and-social-science/zoologists-and-wildlife-biologists.htm>

³ <http://sicb.org/about/>

Required Courses for the Specialization: Integrative Biology				
BIOL	720/L	Survey of Biostatistical Methods	4	No
BIOL	725	Integrative Organismal Biology	3	Yes
Choose 3 credit hours of the following areas:				
Sub-Organismal Group				
BIOL	743	Cell Biology	3	No
Advisory committee approved elective				No
Organismal Group				
BIOL	730	Behavioral Neuroscience	3	No
Advisory committee approved elective				No
Super-Organismal Group				
BIOL	711	Foundations of Ecology and Conservation	3	Yes
Advisory committee approved elective				No
Required Specialization Subtotal			16	
Total number of hours optional Bioinformatics specialization			16	
Total number of hours required for completion of major			72	
Total number of hours required for completion of degree			72	

5. Complete the following charts to indicate if the university intends to seek authorization to deliver the entire specialization at any off-campus location (e.g., UC Sioux Falls, Capital University Center, Black Hills State University-Rapid City, etc.) or intends to seek authorization to deliver the entire specialization through distance technology (e.g., as an on-line program)?⁴

	Yes/No	If Yes, list location(s), including the physical address	Intended Start Date
Off-campus	No		

	Yes/No	If Yes, identify delivery methods	Intended Start Date
Distance Delivery	No		

6. **Additional Information:** Additional information is optional. Use this space to provide pertinent information not requested above. Limit the number and length of additional attachments. Identify all attachments with capital letters. Letters of support are not necessary and are rarely included with Board materials. The University may include responses to questions from the Board or the Executive Director as appendices to the original proposal where applicable. Delete this item if not used.

⁴ The accreditation requirements of the Higher Learning Commission (HLC) require Board approval for a university to offer programs off-campus and through distance delivery.