



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

<b>UNIVERSITY:</b>	<b>USD</b>
<b>TITLE OF PROPOSED SPECIALIZATION:</b>	<b>Molecular Biology &amp; Genetics</b>
<b>NAME OF DEGREE PROGRAM IN WHICH SPECIALIZATION IS OFFERED:</b>	<b>Basic Biomedical Science (Ph.D.)- U.PHD.BMDS</b>
<b>INTENDED DATE OF IMPLEMENTATION:</b>	<b>3/2/2021</b>
<b>PROPOSED CIP CODE:</b>	<b>26.0102</b>
<b>UNIVERSITY DEPARTMENT:</b>	<b>Basic Biomedical Sciences</b>
<b>BANNER DEPARTMENT CODE:</b>	<b>UBBS-Consolidated Bio-Med Sciences</b>
<b>UNIVERSITY DIVISION:</b>	<b>Sanford School of Medicine</b>
<b>BANNER DIVISION CODE:</b>	<b>2M</b>

**Please check this box to confirm that:**

- The individual preparing this request has read [AAC Guideline 2.6](#), which pertains to new specialization requests, and that this request meets the requirements outlined in the guidelines.
- This request will not be posted to the university website for review of the Academic Affairs Committee until it is approved by the Executive Director and Chief Academic Officer.

**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.*

<i>Elizabeth M. Freeburg</i>	10/22/2020
Institutional Approval Signature	Date
<i>President or Chief Academic Officer of the University</i>	

**1. Level of the Specialization:**

Baccalaureate       Master's       Doctoral

**2. What is the nature/purpose of the proposed specialization? Please include a brief (1-2 sentence) description of the academic field in this specialization.**

The Basic Biomedical Sciences (BBS) graduate program is an interdisciplinary graduate program providing research training in a wide range of disciplines. Several specializations exist within the program to provide students with intensive coursework training in an area of particular relevance to their dissertation research. This specialization in Molecular Biology & Genetics will add a new research area for students not focusing on the current specialization options (Neuroscience, Infectious Disease, Cancer Biology, Cardiovascular Biology, and Systems Physiology).

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

This specialization will focus on the broad molecular biological and genetic mechanisms underlying human disease. There are already numerous students in the BBS program working in this area of biomedical research, as well as numerous faculty mentors whose research aligns with this specialization. The supporting coursework will provide additional training and consists of three relatively new courses specifically designed to support this area of study (Genetics of Human Disease, Developmental Biology of Disease, and Molecular Mechanisms of Disease). As a minimum of 15 credit hours of non-research coursework beyond the core curriculum is required for each specialization, these courses significantly expand on the longer standing courses to provide substantial options for students in the specialization.

Given the substantial number of faculty performing research in this area, the Molecular Biology & Genetics specialization will enhance recruitment of new students who may be seeking training in this field. In addition, it will provide training for a wide variety of careers ranging from academic research to the biotech and pharmaceutical industries. In an era in which biomedical research is heavily driven by bench-to-bedside translation and personalized medicine, the modern scientific workforce is experiencing a dramatic increase in the areas of genomics, bioinformatics analysis, and clinical application of genetic data<sup>1-3</sup>. The focus of this specialization on molecular and genetic disease mechanisms will enable graduates to be competitive for a variety of positions in basic, translational, and clinical science.

<sup>1</sup> “Spotlight on the Human Genome: Ten years on from the publication of the draft human genome, Naturejobs takes a look at promising areas of job growth in bioinformatics, DNA sequencing and genomic medicine.” *Nature Jobs*, February 9, 2011. doi:10.1038/nj0330.

<sup>2</sup> “An Explosion of Bioinformatics Careers.” *Science Careers*, June 13, 2014.

<sup>3</sup> “Personalized Medicine Market Worth \$149+ Billion by 2020 Covering Companion Diagnostic and Targeted Therapeutics.” *PR Newswire*, February 9, 2016.

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

Prefix	Number	Course Title	Credit Hours	New (yes, no)
CPHD	720	Foundations I ( <i>core</i> )	3	No
CPHD	721	Foundations II ( <i>core</i> )	3	No
CPHD	610	Experimental Design and Analysis ( <i>core</i> )	3	No
CPHD	727	Responsible Conduct of Research ( <i>core</i> )	1	No
CPHD	890	Seminar (twice/year) ( <i>core</i> )	8-12	No
CPHD	898	Dissertation Research	30+	No
<b>Select 15 credit hours from the following for the Molecular Biology &amp; Genetics specialization:</b>				
CPHD	725	Genetics of Human Disease	3	No
CPHD	763	Developmental Biology of Disease	3	No
CPHD	762	Molecular Mechanisms of Disease	3	No
BIOC	752	Molecular Biology of the Gene	3	No
CPHD	702	Signal Transduction	3	No
CPHD	740	Protein Quality Control	3	No
CPHD	601	Introduction to Bioinformatics	3	No
MICR	722	Advanced Immunology	4	No
NSCI	720	Neurobiology of Disease	4	No
CPHD	710	Hallmarks of Cancer I	3	No
CPHD/NSCI/MICR	792	Special Topics	1-4	No
CPHD/NSCI/MICR	600	Journal Club	1-4	No
Total number of hours required for completion of specialization			15	
Total number of hours required for completion of degree			81	

## 5. Delivery Location

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

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

	Yes/No	Intended Start Date
<b>On campus</b>	Yes	Spring 2021

	Yes/No	If Yes, list location(s)	Intended Start Date
<b>Off campus</b>	No		

	Yes/No	If Yes, identify delivery methods Delivery methods are defined in <a href="#">AAC Guideline 5.5.</a>	Intended Start Date
<b>Distance Delivery (online/other distance delivery methods)</b>	No		

**B. Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the specialization through distance learning (e.g., as an on-line program)? This question responds to HLC definitions for distance delivery.**

	Yes/No	If Yes, identify delivery methods	Intended Start Date
<b>Distance Delivery (online/other distance delivery methods)</b>	No		