PROGRAM MODIFICATION PROPOSAL

Name of Institution
Medical University of South Carolina

Name of Program (include concentrations, options, and tracks)
PhD Epidemiology

Program Designation

- ☐ Associate's Degree
- ☐ Bachelor's Degree: 4 Year
- ☐ Bachelor's Degree: 5 Year
- ☐ Doctoral Degree: Professional Practice (e.g., Ed.D., D.N.P., J.D., Pharm.D., and M.D.)
- ☐ Master's Degree
- ☐ Specialist
- ☒ Doctoral Degree: Research/Scholarship (e.g., Ph.D. and DMA)

Does the program qualify for supplemental Palmetto Fellows and LIFE Scholarship awards?

- ☐ Yes
- ☒ No

Proposed Date of Implementation
March 1, 2018

CIP Code
26.1309

Delivery Site(s)
Medical University of South Carolina

Delivery Mode

- ☒ Traditional/face-to-face*
  *select if less than 50% online
- ☐ Distance Education
  - ☐ 100% online
  - ☐ Blended (more than 50% online)
  - ☐ Other distance education

Program Contact Information (name, title, telephone number, and email address)
Dr. John Vena
Professor and Founding Chair, Department of Public Health Sciences
843-876-8687
vena@musc.edu

Institutional Approvals and Dates of Approval
Department of Public Health Sciences Epidemiology Curriculum Committee: 06 September 2016
College of Graduate Studies Curriculum Committee: October 24, 2017
Education Advisory Committee: December 5, 2017
MUSC Provost Council: December 18, 2017

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Background Information

Provide a detailed description of the proposed modification, including its nature and purpose and centrality to institutional mission. (1500 characters)

MUSC has been offering a single PhD Degree in Biometry and Epidemiology (CIP 26.1101) for over three decades. Applicants to this PhD program, upon matriculation, gravitate to either biostatistics or epidemiology, based on their career interest, with subsequent coursework and research training appropriately tailored. Students therefore receive a breadth of training in both disciplines, but a depth of experience (specifically research and higher level seminars) in one or the other. This evolution in the program has been incremental over time, in an effort to ensure that the program remains current with advances in each area. Following initial didactic training, the program diverges/specializes in subsequent years with distinct content requirements for qualifying examinations and expectations for research. Because the degree is still labeled with both disciplines in the title, it can be confusing to prospective students interested in pursuing either biostatistics or epidemiology. Therefore, we request CHE approval to modify our existing program as two separate doctoral training programs in Biostatistics (CIP 26.1102) and Epidemiology (CIP 26.1309). The proposed modified degree programs are fundamentally unchanged with respect to curriculum and research training, so students enrolled in the current PhD program will not be disadvantaged. The transition will assist current students and prospective students by providing a more specific and focused title to the expertise they will acquire from the program. It is important to note that since the initiation of the PhD program in Biometry and Epidemiology, the fields of Biostatistics and Epidemiology have evolved to become distinct specializations and hence the modification is essential.

The well-respected PhD Epidemiology program at the Arnold School of Public Health at the University of South Carolina has been operating in parallel to MUSC's PhD in Biometry and Epidemiology program for decades with minimal competition, and all our graduates receive employment in academia, research and government immediately after graduation, further supporting that the requested program modification to allow the PhD in Epidemiology to exist as a distinct degree program will not adversely affect the existing program at USC nor will it create an imbalance in supply to demand for doctorally-trained epidemiologists.

List the objectives of the modified program. (1500 characters)

The following lists core competencies of the Epidemiology PhD degree:

- Identify key data sources for epidemiologic investigations
- Identify the principles and limitations of public health screening programs
- Describe a public health problem in terms of magnitude, person, time and place
- Explain the importance of epidemiology for informing scientific, ethical, economic and political discussions of health issues
- Calculate, apply and critically evaluate basic and advanced epidemiologic measures of association and disease frequency
- Understand prediction, confounding, mediation and effect modification
- Communicate epidemiologic information to lay and professional audiences
- Design, analyze and evaluate epidemiologic studies
- Assess study internal and external validity
- Demonstrate skills in data collection and management
- Characterize issues associated with missing data
- Understand sampling design for common observational studies, complex sample surveys and clinical trials
- Evaluate and analyze causal associations
- Understand the global, cultural and social context of health and disease
- Develop expertise in a substantive disease-specific area

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Assessment of Need

Provide an assessment of the need for the program modification for the institution, the state, the region, and beyond, if applicable. (1500 characters)

The Epidemiology PhD degree program aligns with MUSC's missions in disease prevention, patient and community wellness, and population health.

PhD-trained epidemiologists help fill a growing need for qualified public health professionals as the nation transitions to a new health care delivery model. The program will provide graduates marketable skills for careers in public health agencies, health departments, hospitals and other health care organizations, government regulatory agencies, not-for-profit agencies, academic institutions, and industry. Graduates with PhD training are equipped to enter careers in current and projected growth areas, as shown on the following table. While the table below does not predict an increase in the need for PhD-trained epidemiologists in the state of South Carolina specifically, we believe the growth of big data and increase in public health initiatives will provide these specialized professionals numerous job opportunities not necessarily yet categorized by the Bureau of Labor Statistics.

Area	Title	Base	Projected	Change	% Change	Avg. Anl Openings
South Carolina	Epidemiologists	20	20	0	6.3	00
United States	Epidemiologists	5,800	6,100	400	6.3	220

Area	Title	Base	Projected	Change	% Change	Avg. Anl Openings
South Carolina	Statisticians	410	560	150	37.9	20
United States	Statisticians	30,000	40,100	10,100	33.8	1,540

Area	Title	Base	Projected	Change	% Change	Avg. Anl Openings
South Carolina	Survey Researchers	130	140	10	13.6	00
United States	Survey Researchers	16,700	18,700	1,900	11.6	390

Area	Title	Base	Projected	Change	% Change	Avg. Anl Openings
South Carolina	Health Educators	880	1,000	120	13.3	30
United States	Health Educators	61,400	68,900	7,500	12.2	1,950

Source: www.projectionscentral.com (US Bureau of Labor Statistics database)

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Will the proposed modification impact any existing programs and services at the institution?

☒ Yes

☐ No

If yes, explain. (1000 characters)

Eliminating the existing degree and replacing it with PhD in Epidemiology (see separate modification form for Biostatistics) will provide students the opportunity to gain the specialized training that is most marketable in industry and academia and health care today.

We currently have 26 students in the existing PhD program (including four students who enrolled in Fall 2017). The proposed change would direct 10 of those to the proposed PhD Epidemiology degree program (which includes 2 of the four new students). This change is not expected to significantly affect number of students enrolled in the degree program—only to accurately divide the current students enrolled in the PhD degree in Biometry and Epidemiology into one degree or the other and to appropriately enroll new students into the degree program that best serves their career interests. In the projected new enrollment table that follows, we propose that 3 students per year may enter this new degree program.

List of Similar Programs in South Carolina

Program Name	Institution	Similarities	Differences
PhD Epidemiology	Arnold School of Public Health, USC	Core course work	• Emphasis on quantitative methodology, use of large databases, spatial epidemiology, environmental epidemiology, and cancer epidemiology • Emphasis on collaborative biomedical research • Different student pool • Different elective coursework

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Description of the Program

Projected New Enrollment						
Year	Fall		Spring		Summer	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2017	3	45	3	45	3	45
2018	6	90	6	90	6	90
2019	9	135	9	135	9	135
2020	12	180	12	180	12	180
2021	15	225	15	225	15	225

Curriculum

Attach a curriculum sheet identifying the courses required for the program.

Curriculum Changes

Note: Complete this table only if there are changes to the curriculum.

Courses Eliminated from Program	Courses Added to Program
	No new courses will be added. All required and elective courses currently exist and are available to students
Biostatistics Methods IV (BMTRY 702)	
Analysis of Categorical Data (BMTRY 711)	
Analysis of Survival Data (BMTRY 722)	
Bayesian Biostatistics (BMTRY 719)	
Linear Models in Biology and Medicine (BMTRY 714)	
Advanced Inference (BMTRY 779)	

Faculty

Provide a brief explanation of any additional institutional changes in faculty and/or administrative assignment that may result from implementing the proposed program modification. (1000 characters)

Administrative responsibilities will be shared between the two revised programs, and existing faculty and personnel will implement the programs. The graduate program student services coordinator will commit 50% time to the Epidemiology program and 50% to the Biostatistics program. Program oversight will be conducted by the graduate coordinator for Epidemiology and the Vice Chair for Academic Programs. In short, MUSC can provide the expertise needed for this PhD in Epidemiology with existing faculty and staff.

Resources

Identify any new library/learning resources, new instructional equipment, and new facilities or modifications to existing facilities needed to support the modified program. (2000 characters)

We have had a longstanding history of providing a doctoral level education in Epidemiology, and hence we have sufficient educational resources to support this program modification.

It is not anticipated that additional equipment will be necessary. The current computing and data storage equipment will be updated and replaced using the normal acquisition process. DPHS has Full time Information Technology (IT) Support personnel for support staff, faculty and student systems and software. DPHS provides Network access to internet resources, shared department network storage and services as well as access to High Performance Compute Clustering. DPHS IT staff provide software.

Given the projected annual enrollment in this program (~15 students enrolled), the current physical plant will be adequate to meet the educational needs of the students. The core classes taught to students in this program will be conducted in existing classrooms in Cannon Place, the Bioengineering building, and the Drug Discovery building as needed. These classrooms are all equipped with SmartBoard technology, high definition cameras, high-fidelity projection systems, and all necessary audiovisual equipment.

PROGRAM MODIFICATION PROPOSAL

Financial Support

Estimated New Costs by Year (ALL COSTS SHOWN HERE)						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Program Administration	33,797	34,810	35,855	36,930	38,037	179,429
Faculty and Staff Salaries	528,799	544,663	561,003	577,833	595,168	2,807,466
Graduate Assistants	84,000	168,000	252,000	336,000	420,000	1,260,000
Grad. Asst. Tuition	15,270	30,540	45,810	61,080	76,350	229,050
Grad. Asst. Health Ins.	6,054	12,108	18,162	24,216	30,270	90,810
Supplies and Materials	750	773	796	820	844	3,983
Library Resources	-	-	-	-	-	-
Other*	-	-	-	-	-	-
Total	668,670	790,894	913,626	1,036,879	1,160,669	4,570,738
Sources of Financing						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Grant Funded Tuition	-	5,090	20,360	35,630	50,900	111,980
Dean Funded Tuition	15,270	25,450	25,450	25,450	25,450	117,070
Grant Funded Stipend	-	28,000	112,000	196,000	280,000	616,000
Dean Funded Tuition	84,000	140,000	140,000	140,000	140,000	644,000
Program-Specific Fees	3,885	3,885	3,885	3,885	3,885	19,425
State Funding (i.e., Special State Appr)*	-	-	-	-	-	-
Reallocation of Existing Funds*	565,515	588,469	611,931	635,914	660,434	3,062,263
Federal Funding*	-	-	-	-	-	-
Total	668,670	790,894	913,626	1,036,879	1,160,669	4,570,738
Net Total (i.e., Sources of Financing Minus Est. New Costs)	0	0	0	0	0	0

*Provide an explanation for these costs and sources of financing in the budget justification.

PROGRAM MODIFICATION PROPOSAL

Budget Justification

Provide a brief explanation for the other new costs and any special sources of financing (state funding, reallocation of existing funds, federal funding, or other funding) identified in the Financial Support table. (1000 characters)

Note: Institutions need to complete this budget justification *only* if any other new costs, state funding, reallocation of existing funds, federal funding, or other funding are included in the Financial Support table.

While only new costs are requested, the budget table shows all costs to assist in reviewing the proposal and shows that the existing costs of the current PhD in Biometry and Epidemiology will be shared between the PhD Biostatistics and PhD Epidemiology degree programs.

Thus, implementation of this program will not incur any unique costs or special state appropriations. Tuition and research grants to the faculty will be the primary source of funding. Most of the necessary infrastructure exists now, so there will be no new costs directly associated with the program administration.

Evaluation and Assessment

Will any the proposed modification impact the way the program is evaluated and assessed?

☐ Yes

☒ No

If yes, explain. (1000 characters)

Per university policy, each academic degree program engages in continuous quality improvement through annual self-assessment of performance on program outcomes (PO) and student learning outcomes (SLO). At least every third year in a four year assessment cycle, these data drive comprehensive plans for improvement.

Program Outcome 1: The program performs well on dashboard indices of quality
Assessed by: Percentage of students who graduate within 150% of program length (7.5 years); Percentage of students who obtain full-time employment in a relevant field within 6 months of graduating.

Student Learning Outcome 1: Evidence scientific curiosity reflective of a career biomedical scientist
Assessed by: Faculty evaluations of the student in the third year; performance on his/her oral defense for breadth and depth of knowledge in epidemiology (as determined by a standardized rubric)

Student Learning Outcome 2: Demonstrate the ability to think independently
Assessed by: Faculty evaluations of the student in the third year; performance on his/her oral defense for critical thinking and assimilation of knowledge in epidemiology (as determined by a standardized rubric)

Student Learning Outcome 3: Design, complete, and defend a rigorous scientific research project
Assessed by: Faculty evaluations of the student in the third year; performance on his/her oral defense as

an overall assessment (as determined by a standardized rubric)

Student Learning Outcome 4: Demonstrate strong communication skills (orally and written)
Assessed by: Faculty evaluations of the student in the third year; performance on his/her oral defense for overall quality of presentation (as determined by a standardized rubric)

Will the proposed modification affect or result in program-specific accreditation?

☐ Yes

☒ No

If yes, explain; if the modification will result in the program seeking program-specific accreditation, provide the institution's plans to seek accreditation, including the expected timeline for accreditation. (500 characters)

Will the proposed modification affect or lead to licensure or certification?

☐ Yes

☒ No

If yes, explain how the program will prepare students for licensure or certification. (500 characters)

Teacher or School Professional Preparation Programs

Is the proposed modified program a teacher or school professional preparation program?

☐ Yes

☒ No

If yes, complete the following components.

Area of Certification

Attach a document addressing the South Carolina Department of Education Requirements and SPA or Other National Specialized and/or Professional Association Standards.

UNIVERSITY OF SOUTH CAROLINA

Department of Epidemiology and Biostatistics
Arnold School of Public Health

November 6, 2017

John Vena, Ph.D.
Professor and Founding Chair
Department of Public Health Sciences
Medical University of South Carolina

Dear Dr. Vena,

I appreciate you sharing the program modification applications that the Medical University of South Carolina will submit to the Commission on Higher Education. There is a strong rationale to separate the current Ph.D. in Biometry and Epidemiology degree program into two distinct degree programs, a Ph.D. in Epidemiology and a Ph.D. in Biostatistics. There is a similarly strong rationale to take a parallel step with the Masters of Science degree in Biomedical Sciences with a concentration in Biometry and Epidemiology and separate it into two separate concentrations, an M.S. in Epidemiology and an M.S. in Biostatistics.

The characterization in your program modifications of the differences between the Medical University of South Carolina's and the University of South Carolina's degree programs in these areas are accurate, and I agree that these changes will not result in unnecessary competition or duplication between the programs at the two institutions. Similarly, your summary is accurate that the programs at our two universities have been operating in parallel for decades with minimal competition. Your requested separation of the program into separate Ph.D. programs and M.S. concentrations will not adversely affect the existing program in the Department of Epidemiology and Biostatistics at the University of South Carolina's Arnold School of Public Health, nor will it create a greater supply than demand for well-trained epidemiologists or biostatisticians in South Carolina.

Sincerely,

Anthony J. Alberg

Anthony J. Alberg, Ph.D., M.P.H.
Professor and Chair
Department of Epidemiology and Biostatistics
Arnold School of Public Health
Medical University of South Carolina

UNIVERSITY AT ALBANY
State University of New York

Department of Environmental Health Sciences
School of Public Health

A joint venture with the
New York State Department of Health
In affiliation with Albany Medical College

John Lane, DMA
Director of Academic Affairs
South Carolina Commission on Higher Education
1122 Lady Street, Suite 300
Columbia, SC 29201

December 4, 2017

Dear Dr. Lane:

I am pleased to review the Ph.D. program in epidemiology at the Medical University of South Carolina (MUSC). In terms of my background, I was awarded a Ph.D. in epidemiology from the Yale University School of Public Health in 1982, and have 35 years' experience in teaching epidemiologic methods and conducting epidemiologic research. In addition, I have served as the Chair of the Department of Epidemiology and Biostatics and the Associate Dean for Research at the School of Public Health, University at Albany, State University of New York. Consequently, I believe that I am well qualified to review the epidemiology program at MUSC.

The proposal to divide the joint Ph.D. program into two separate programs is in line with the norm for Schools of Public Health across the USA. In fact, although epidemiology and biostatistics faculty are often combined in a single department, I am not aware of any program that offers only a single combined doctoral degree. The proposed program of studies is consistent with those of other epidemiology in that it includes required courses in epidemiologic methods and biostatistics, along with electives in a student's area of concentration. The number and breadth of electives covers all the major content areas in epidemiology and should be more than sufficient to meet student needs. A qualifying examination including epidemiologic methods, biostatistics, and the student's area of concentration is standard. The culminating experience is the dissertation, and the requirement that it result in three published papers is commonplace. There is no reference to the need to prepare and defend a dissertation proposal before engaging in dissertation research, but presumably this is a requirement. In addition, the epidemiological methods courses refer to use of EGRET and EPICURE software. Nationwide, most epidemiologists use SAS or R software, but these may be included in the biostatistics courses. In general, however, this is a strong proposed course of study that should graduate well trained and highly marketable epidemiologists.

To my knowledge, the only overlap is with the Arnold School of Public Health at the University of South Carolina in Columbia. I do not envision this to be a major concern, however, since many state university systems support multiple doctoral programs in epidemiology, and the demand for epidemiologists in South Carolina and nationwide is high. The program should be "resource-neutral" in that it requires no additional resources. Instead, existing resources will simply be divided between two parallel

UNIVERSITY AT ALBANY
State University of New York

Department of Environmental Health Sciences
School of Public Health

A joint venture with the
New York State Department of Health
In affiliation with Albany Medical College

programs. The faculty are clearly ready and able to offer the doctoral program in epidemiology since they already have done so for many years as part of the combined degree with biostatistics.

To conclude, I believe that the proposed Ph.D. program is strong, consistent with national norms and standards, and well justified. I support it without reservation. Please feel free to contact me at 518-402-1062 or efitzgerald@albany.edu if you need any further information.

Sincerely,

Edward F. Fitzgerald, Ph.D.
O'Leary Professor and Associate Dean Emeritus
Departments of Environmental Health Sciences and Epidemiology and Biostatistics