NEW PROGRAM PROPOSAL

Name of Institution: **Medical University of South Carolina**

Name of Program (include concentrations, options, and tracks)
Post-Professional Masters of Science Degree in Cardiovascular Perfusion

Program Designation

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

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

- ☐ Yes
- X☐ No

Proposed Date of Implementation
Fall 2016

CIP Code

Delivery Site(s)
College of Health Professions
Medical University of South Carolina

Delivery Mode

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

Program Contact Information (name, title, telephone number, and email address)

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Institutional Approvals and Dates of Approval

This proposal has been reviewed and approved by the following internal review bodies at MUSC:

College of Health Professions Leadership Council	January 29, 2015
Education Advisory Committee	February 3, 2015
Deans' Council	February 16, 2015
Senior Leadership Council	February 24, 2015
Board of Trustees	April 9, 2015

Background Information

State the nature and purpose of the proposed program, including target audience and centrality to institutional mission. (1500 characters)

The College of Health Professions at MUSC proposes to offer Post-Professional Master of Science in Cardiovascular Perfusion. This program is consistent with the mission of MUSC to preserve and optimize human life in South Carolina and beyond. This program allows working perfusionists who have completed an AC-PE accredited perfusion education program the opportunity to advance their educational and professional goals.
New technologies and surgical procedures require that practicing certified cardiovascular perfusionists (C.C.P.) have an increased knowledge base for managing both neonates and elderly patients with complex medical conditions as well as the application of new cardiac assist devices. Leadership skills are becoming more essential as an increased number of practicing cardiovascular perfusionists attain leadership roles.
This graduate level program will provide a plan of study that includes coursework and a capstone research project that is designed to address these requirements. Courses will be available through a variety of distance learning technologies (asynchronous online activities, independent reading, and projects).
Nearly 300 students have graduated from the MUSC Cardiovascular Perfusion Program with a bachelor's degree. This will provide an opportunity for them and other practicing clinical perfusionists with a bachelor's degree to enroll in a graduate degree program in Cardiovascular Perfusion. This post-professional program will allow MUSC graduates to remain competitive for clinical positions as other perfusion school graduates enter the profession with a Master's Degree and as the number of perfusionists with graduate level education increases

List the program objectives. (2000 characters)

1. To enable **practicing certified cardiovascular perfusionists (C.C.P.)** with a bachelor's degree in good standing to earn a Master of Science in Cardiovascular Perfusion degree.

2. To provide C.C.P.s access to complete their degree while they **continue to work** in their profession through the use of distance learning technologies.

3. To provide cardiovascular perfusionists with the opportunity to advance professionally and personally, to further develop independent-thinking and critical-judgment skills, and **to be competitive in today's healthcare environment.**

4. To enhance C.C.P.s' **knowledge and clinical skills in treatment of neonates and elderly patients.**

5. To increase C.C.P.s' **knowledge and skills in the application of cardiac assist devices** to all age groups.

6. **To enhance leaderships skills** to provide a strong foundation for management of a clinical perfusion service.

7. To increase the **opportunities for advancement** in the perfusion profession for graduates. Graduate level students are more competitive in the job market.

8. To **improve patient care by contributing research** to the body of knowledge related to perfusion technology. Graduate level education provides the necessary research skills for the delivery of evidenced-based clinical patient care. The President of the American Academy of Cardiovascular Perfusion endorsed graduate education when he said, "Graduates who possess graduate degrees are ideally suited to become the individuals who lead the next technological revolution in perfusion technology. Without trained scientists, our profession will disappear as a mere footnote in medical history." Improvement in medical and surgical care requires training in research and quality improvement.

Assessment of Need

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

1. Less than 20% of practicing cardiovascular perfusionists (C.C.P) have a graduate degree; however, nearly **50% of graduating perfusionists in 2014 are from graduate level programs**. In order to remain competitive, access to graduate level education in this profession is needed. **There is only one post professional program currently in the U.S** and over 3000 perfusionists with only an undergraduate degree.
2. Currently, many hospitals are trying to increase the educational level of nurses because hospitals recognize that higher educational levels are associated with decreases in mortality, readmission rates and length of stay. **Improvements in outcomes following cardiac surgery would also be expected to occur if the educational level of graduating perfusionists is increased, similar to the effect seen in nursing.**
3. The demand for **cardiac-related services is expected to grow by 20%** between 2013 and 2025 as the population ages.

4. There is an increased complexity of surgical procedures due to the large number of **elderly and very young patients** (less than 1 month of age) with significant medical conditions now undergoing cardiac procedures. These high risk patients have an increased risk of mortality and morbidity following surgery. A high level health care practitioner is necessary to insure that high quality evidence-based care is delivered.
5. A recent needs assessment survey identified **leadership training as an important area** for additional training at the graduate level. We have included courses on leadership, quality improvement and informatics to fulfill that demand.

Employment Opportunities

Is specific employment/workforce data available to support the proposed program?

☐Yes

X☐No

If yes, complete the table and the component that follows the table on page 4. If no, complete the single narrative response component on page 5 beginning with "Provide supporting evidence."

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Employment Opportunities			
Occupation	**Expected Number of Jobs**	**Employment Projection**	**Data Source**
Perfusionist	No US Bureau of Labor Statistics Available		

Provide additional information regarding anticipated employment opportunities for graduates. (1000 characters)

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Provide supporting evidence of anticipated employment opportunities for graduates, including a statement that clearly articulates what the program prepares graduates to do, any documented citations that suggests a correlation between this program and future employment, and other relevant information. Please cite specific resources, as appropriate. (3000 characters)

Note: Only complete this if the Employment Opportunities table and the section that follows the table on page 4 have not previously been completed.

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1. Perfusion is a small and highly specialized profession. **Many new technologies have become an integral part of cardiovascular perfusionist's scope of practice**, and the entry-level skills and knowledge required of the cardiovascular perfusionist have significantly increased over the past several decades. **These new technologies increase the opportunities for employment and require additional training at the graduate level in order to be effectively utilized.**
2. Many perfusion departments have increased in size due to the rising volume of cardiac surgical procedures, and therefore many perfusionists have assumed important leadership roles in their cardiac surgical programs and are seeking training in leadership. Leadership training will **provide advancement in the profession as graduates will be more competitive** seeking perfusion department director positions.
3. The MUSC Cardiovascular Perfusion Program has been recognized for its significant contributions to research in the profession with the **highest number of published scientific peer-reviewed research from any perfusion school in the U.S. (Journal of ExtraCorporeal Technology 1979-2014). The MUSC track record for scientific contribution to the profession is very strong and increases employment opportunities for MUSC graduates.**
4. The employment rate for MUSC graduates over the past five years is > 97%, with starting salaries > $80,000. **The job market for cardiovascular perfusionists based on the number of advertised positions is the strongest it has been in the past 10 years**. Advertisements for vacant perfusion positions have increased more than 100% in each of the last 4 years. MUSC perfusion graduates are in high demand; most students have job offers prior to graduation due to their clinical rotations at highly recognized cardiac surgical centers.
5. Based on estimations from recently conducted manpower surveys, the expected number perfusionists leaving the profession due to retirement, to pursue another profession, or due to family work/balance issues is expected to reach nearly 5% of the profession per year over the next 10 years. **That means that 2000 perfusionists will have to be replaced during this time period.** The present output of all the perfusion schools is about 50% of what will be necessary to fill these jobs in future. As the second largest perfusion education program in the U.S., MUSC is poised to fill the gap in the projected shortage.

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Will the proposed program impact any existing degree programs and services at the institution (e.g., course offerings or enrollment)?

☐Yes

X☐No

If yes, explain. (500 characters)

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List of Similar Programs in South Carolina

Program Name	Institution	Similarities	Differences
NONE			

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Description of the Program

Projected Enrollment						
Year	Fall		Spring		Summer	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2016	5	35	4	28	4	24
2017	5	35	4	28	4	24
2018	5	35	4	28	4	24
2019	5	35	4	28	4	24
2020	5	35	4	28	4	24

Besides the general institutional admission requirements, are there any separate or additional admission requirements for the proposed program?

X☐Yes

☐No

If yes, explain. (1000 characters)

1. Completion of an AC-PE accredited perfusion education program.
2. Certified Clinical Perfusionist (CCP) by the American Board of Cardiovascular Perfusion.
3. Eligible transfer credits from an accredited perfusion program
4. Completion of a Bachelor's degree at an accredited university which must include the following prerequisite courses

Anatomy and Physiology (includes lab)	8
Chemistry (includes lab)	8
Medical Terminology	1
Physics (includes lab)	4
Statistics	3
Research Course and Methods	3

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Are there any special articulation agreements for the proposed program?

☐Yes

X☐No

If yes, identify. (1000 characters)

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Curriculum

Select one of the following charts to complete: Curriculum by Year **or** Curriculum by Category

Curriculum by Year					
Course Name	**Credit Hours**	**Course Name**	**Credit Hours**	**Course Name**	**Credit Hours**
Year 1					
Fall		**Spring**		**Summer**	
Quality Improvement and Clinical Informatics	2	Leadership and Health Services Delivery Systems	2	Cardiac Assist Devices	2
Masters Research Project I	4	Masters Research Project II	4	Masters Research Project III	3
Evidenced Based Medicine	1	Pathophysiology of Aging	1	Pediatric Perfusion	1
Total Semester Hours	**7**	**Total Semester Hours**	**7**	**Total Semester Hours**	**6**
				Summer	
Transfer credits	**10**				
Total Semester Hours	**30**				

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Curriculum by Category*					

* Add category titles to the table (e.g., major, core, general education, concentration, electives, etc.)

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Total Credit Hours Required = 30

Course Descriptions for New Courses

Course Name	Description
Leadership and Health Services Delivery	This course introduces students to the management of health care facilities. Students gain an understanding of the major functions of management, governance, organizational structures, accreditation/licensure processes, and reimbursement issues in health care organizations. Students will become familiar with and understand the importance of the principles of management including planning, organizing, controlling, directing, and staffing in order to offer health care services. The course will also demonstrate the basic concepts and issues associated with the management and regulations of health care services delivery, and explore the impact of contemporary public policy issues confronting the health care system.
Quality Improvement and Informatics	This course provides students with an understanding of quality management and performance improvement. This will include quality assessment, risk management, outcomes assessment, benchmarking. The course focuses primarily on providing students with the necessary knowledge and skills for understanding systems improvement and then participating and leading quality improvement (QI) efforts. Students also gain knowledge of the importance of measuring and managing service excellence and patient satisfaction. This course also provides students with an introduction to health care information systems, with an emphasis on clinical information systems. Students are introduced to different types of clinical and administrative information systems used in health care today.
Masters Research Project I	This course provides a background on general principles and issues in clinical research design. These are explored through the formulation of the research objective and the research hypothesis and the specification of the study population, the experimental unit, and the outcome variables. This course integrates on core clinical perfusion principles to provide experience in the development and critique of the methodological aspects of clinical research protocols and the clinical research literature. Assigned readings are drawn from contemporary perfusion scientific literature.
Masters Research Project II	In this course the student develops a research project relating to cardiovascular perfusion resulting in a substantive paper that involves original collection or treatment of data and/or results ins a research. The final product of a research project is a paper of publishable quality. This research project involves original research and exemplifies an original contribution to scholarship.
Masters Research Project III	In this final research course, the student submits their research project for presentation and publication. The course requirements will include editorial changes suggested during peer review in order to achieve final publication in a perfusion-related journal.

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Pathophysiology of Aging	This course presents a survey of the concepts of human disease as part of the aging process. It includes a study of immunological defense mechanisms, acute and chronic inflammation, repair mechanisms, modes of injury, diseases of development and growth, and blood disorders and neoplasia.
Cardiac Assist Devices	This course introduces student to the advanced practice associated with cardiac assist devices. Selection, operation and monitoring of various cardiac assist devices including include both FDA approved and investigational devices. Other areas of focus will include patient education, community education, surgical coordination, clinical visits. And managing VAD databases and clinical trials, including data analysis for presentations.
Pediatric Perfusion	This course review anatomical and physiological characteristics of congenital heart defects and their implications for the conduct of perfusion. Special considerations in the conduct of perfusion for congenital heart surgery are discussed and modeled.
Evidence Based Medicine	This course will review research based on the classifications of evidenced based medicine and will include examples from the cardiovascular surgery and perfusion literature.

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Faculty

Faculty and Administrative Personnel				
Rank	**Full- or Part-time**	**Courses Taught or To be Taught, Including Term, Course Number & Title, Credit Hours**	**Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major**	**Other Qualifications and Comments (i.e., explain role and/or changes in assignment)**
Associate Professor	Full Time	Masters Research Project FALL (4), ECT 620 SPRING(4), ECT 621 SUMMER (4) ECT 622 Evidence Based Medicine FALL (1) ECT 625 Pediatric Perfusion (1) SUMMER ECT 664	Medical University of South Carolina – Ph.D. in Health and Rehabilitation Science – 2012 Dissertation Topic: The Influence Of The Method Of Cerebral Protection During Neonatal Cardiac Surgery on The Development Of Attention Deficit/Hyperactivity Disorder Medical University of South Carolina – M.S. Degree in Clinical Research – 2005 Long Island University – Master's Degree - Public Administration in Health Care (M.P.A.) - 1980 State University of New York - School of Allied Health Professions - B.S. Degree in Cardiopulmonary Technology/Respiratory Therapy – 1974 Certified Clinical Perfusionist, Fellow of Pediatric Perfusion Courses:	Teaching these courses for the past 20 years, 40 years clinical perfusion experience.

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			Perfusion Perfusion Technology I Perfusion Technology II Fundamentals of Acid-Base Chem Principles and Practices of Perfusion Intro to Research Pediatric Perfusion Independent Study Clinical Experience I, II, & III	
Assistant Professor* (replacing current faculty who is retiring Summer 2015)	Full time	Pathophysiology of Aging (4) SPRING ECT 560 Cardiac Assist Devices (2) SUMMER ECT 665	Active certification as a clinical perfusionist (CCP). Minimum of five years clinical experience; graduate preparation in the basic and clinical sciences relevant to perfusion practice; and prior classroom teaching experience. The ideal professor will have a completed a doctorate or be in the process of obtaining a terminal degree.	Knowledge of clinical practice and professional issues. The most competitive candidates will have a record of expertise in clinical and/or didactic education, experience in curriculum development, academic scholarship, and professional association involvement. Academic rank will be commensurate with credentials and experience.
Assistant Professors* (2)	Adjunct	Quality Improvement and Clinical Informatics (2) FALL ECT 662 Leadership and Health Services Delivery Systems (2) SPRING ECT 663	PhD faculty in HLM Dept.	These 2 courses are derived from 4 courses in the Doctoral Program in Healthcare leadership. They are already well developed and will be tailored meet the needs of the perfusion profession.

Note: Individuals should be listed with program supervisor positions listed first. Identify any new faculty with an asterisk next to their rank.

Total FTE needed to support the proposed program (i.e., the total FTE devoted just to the new program for all faculty, staff, and program administrators):

Faculty: 2 FT faculty teach in the current entry-level program and will teach some of the courses in this post-professional program; 2 new adjuncts will be added to the Division of Cardiovascular Perfusion to teach the remaining courses in the proposed program
Staff: Part time Admin Assistant, Part time Student Services Coordinator for entry-level program will provide support as projected class size is small (0 new)
Administration: Current administration will provide support as projected class size is small (0 new)

Faculty /Administrative Personnel Changes

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

The structure of the Division of Cardiovascular Perfusion will remain the same with 2 FT faculty and the present support staff that serve the entry-level program providing teaching and support to the proposed program. Two new additional adjunct faculty will be added to teach some courses for the proposed program.

Library and Learning Resources

Identify current library/learning collections, resources, and services necessary to support the proposed program and any additional library resources needed. (1000 characters)

The MUSC Library acquires, manages, and maintains resources of knowledge in the biomedical and health sciences. The MUSC Library has available over 220 databases and over 19,000 electronic journals and provides access to a wide range of perfusion and cardiac surgery related journals.
The College of Health Professions (CHP) is housed in a state-of-the art facility with cutting edge classroom technology. The College uses the Moodle learning management system and Tegrity

lecture capture system. All students are required to own a laptop that they bring to campus. All classrooms are equipped with Smart Board technology. High Definition (HD), h.624 video recording, streaming, and conferencing is available in every classroom. Classroom audio/visual is integrated with the Tegrity lecture capture system so that instruction in CHP classrooms, labs or conference rooms can be recorded and distributed online and accessible by mobile devices.

Student Support Services

Identify academic support services needed for the proposed program and any additional estimated costs associated with these services. (500 characters)

No new student support services will be required within the Division of Cardiovascular Perfusion; the existing student support services will be used. Student support services on campus that are available to all MUSC students include the Center for Academic Excellence, the Writing Center, the Wellness Center, Counseling and Psychological Services, and the availability of supplemental instruction from tutors. The current MUSC students report satisfaction with the available university support services that will be available to the students in this program.

Physical Resources

Identify any new instructional equipment needed for the proposed program. (500 characters)

No new equipment is needed. We already have the only 2 cardiopulmonary bypass simulators available.

Will any extraordinary physical facilities be needed to support the proposed program?

☐Yes

X☐No

Identify the physical facilities needed to support the program and the institution's plan for meeting the requirements, including new facilities or modifications to existing facilities. (1000 characters)

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Financial Support

Estimated New Costs by Year						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Program Administration	0	0	0	0	0	0
Faculty and Staff Salaries	12,000	6,000	6,000	6,000	6,000	36,000
Graduate Assistants	0	0	0	0	0	0
Equipment	0	0	0	0	0	0
Facilities	0	0	0	0	0	0
Supplies and Materials	0	0	0	0	0	0
Library Resources	0	0	0	0	0	0
Other*	0	0	0	0	0	0
Total	12,000	6,000	6,000	6,000	6,000	36,000
Sources of Financing						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Tuition Funding	141,849	145,812	149,893	154,098	158,428	750,080
Program-Specific Fees	0	0	0	0	0	0
State Funding (i.e., Special State Appropriation)*	0	0	0	0	0	0
Reallocation of Existing Funds*	0	0	0	0	0	0
Federal Funding*	0	0	0	0	0	0
Other Funding*	0	0	0	0	0	0
Total	0	0	0	0	0	0
Net Total (i.e., Estimated New Costs Minus Sources of Financing)	129,849	139,812	143,893	148,098	152,428	714,080

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

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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.

The additional costs for implementation of this program will be covered by tuition, there is no addition external funding required. There will be two new adjunct faculty added to the budget to teach two new courses in the area of healthcare management, the total cost for teaching these courses will be $12,000 annually. These courses will be taught annually to each cohort of students. They will take the courses with the students in the entry-level master's program which is projected to begin at the same time; therefore, the costs will be split between the two programs resulting in the **$6,000 annually** reflected in the budget. The budget reflects **$12,000 for the first year** as the entry-level master's program is a two-year program and those students do not take these courses until their 2nd year of the program. This post-professional program is a one-year program; therefore, only these students will be taking these courses for the first year reflected in the budget.

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Evaluation and Assessment

Programmatic Assessment: Provide an outline of how the proposed program will be evaluated, including any plans to track employment. Identify assessment tools or software used in the evaluation. Explain how assessment data will be used. (3000 characters)

Since this is post-profession program, the students will be already employed and practicing cardiovascular perfusion.

Southern Association of Colleges and Schools (SACS) Accreditation
Program and Student Learning Outcomes will be reported to the University Office of Institutional Assessment on an annual basis

Results of the Assessment instruments are compiled and then discussed annually at the program advisory meetings. The program advisory committee is charged with the responsibility of meeting at least annually, to assist program and sponsor personnel in formulating and periodically revising appropriate goals and learning domains, monitoring needs and expectations, and ensuring program responsiveness to change. The committee consists of program faculty, medical advisor, department chair, alumni, students, clinical affiliates and one public member. All program outcomes are reviewed.

Teaching Effectiveness Assessments: The University uses E-Value which is an anonymous survey sent to students at the end of each course to evaluate teaching effectiveness. A benchmark of 85% return rate is expected for each evaluated course. There are specific evaluations for both the instructor effectiveness and the course organization and content. The results are benchmarked against faculty evaluations in the college and are used for course improvement and in the annual faculty review process.

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Student Learning Assessment

Expected Student Learning Outcomes	Methods of/Criteria for Assessment
1. Demonstrate knowledge of pathophysiology of aging and the application to cardiopulmonary bypass (CPB)	90% of the students are rated “meets” or “exceeds expectations” on the grading rubric assessing knowledge of pathophysiology of aging and the application to cardiopulmonary bypass
2. Demonstrate knowledge of pathophysiology of pediatric perfusion and procedures used to minimized the inflammatory response associated with CPB	90% of the students are rated “meets” or “exceeds expectations” on the grading rubric assessing knowledge of pathophysiology of pediatric perfusion and the application to cardiopulmonary bypass
3. Demonstrate knowledge regarding the application of cardiac assist devices	90% of the students are rated “meets” or “exceeds expectations” on the grading rubric assessing knowledge regarding the application of cardiac assist devices
4. Demonstrate knowledge in leadership, quality improvement and informatics	90% of the students are rated “meets” or “exceeds expectations” on the grading rubric assessing knowledge in leadership, quality improvement and informatics
5. Completion of a publishable research project	Submission of completed research project to a peer-reviewed perfusion journal for publication

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Will the proposed program seek program-specific accreditation?

☐Yes

X☐ No

If yes, provide the institution's plans to seek accreditation, including the expected timeline for accreditation. (500 characters)

Will the proposed program lead to licensure or certification?

☐Yes

x☐No

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Teacher or School Professional Preparation Programs

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

☐Yes

X☐No

If yes, complete the following components.

Area of Certification

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