

# Program Planning Summary

---

## Master of Science in Integrated Preclinical Medicine

Proposing Institution	Medical University of South Carolina
Program Title	Master of Science in Integrated Preclinical Medicine No concentrations, tracks, or options – fixed content curriculum.
Date of Submission	June 11, 2014
Signature of President of MUSC	
Program Contact	Ben Curry, MS MBA Executive Director of Strategic Projects, College of Medicine <a href="mailto:curry@musc.edu">curry@musc.edu</a> 843.792.6833 96 Jonathan Lucas Street, MSC 617 Charleston, SC 29425

Program Title:	Master of Science in Integrated Preclinical Medicine (new program)
Concentrations, Options, and Tracks	No concentrations, tracks, or options – fixed content curriculum.
Designation, Type, and Level of Degree	Designation: Science, Type: Medical, Level: Master’s Degree
Proposed Date of Implementation:	May, 2015
Scholarship Information:	Graduate level – does not qualify for supplemental Palmetto Fellows Scholarship or LIFE Scholarship awards
Delivery Mode:	Entirely online

## Justification

The Master of Science (MS) in Integrated Preclinical Medicine enhances the position of its graduates to compete for scarce seats in medical school or other health profession programs. It prepares graduates for employment in the growing and increasingly complex healthcare sector. It provides a graduate degree in the health sciences at a lower total cost than traditional Master’s programs, thereby broadening opportunity and reducing student debt.

Competition for admission to medical school has been intensifying. From the year 2001 through 2012, the number of medical school applications from SC residents has increased by 50%, and applications among US residents have risen by 30%. Over the same interval, the number of medical school matriculations has risen nationally by less than 20%.<sup>1</sup> As one example of the intense competition, in 2013, 3558 students applied for admission to MUSC’s MD program, 409 were interviewed, and 170 were admitted, yielding an admittance rate of 5%.<sup>2</sup> By engaging its students in a challenging curriculum based on the preclinical didactics of MUSC’s MD program, the MS in Integrated Preclinical Medicine provides excellent preparation and constitutes a compelling demonstration of the student’s ability and commitment.

The proposed program also advances the qualifications of its graduates to enter directly into jobs in the healthcare sector. The program’s curriculum emphasizes clinical applications of basic science concepts, evidence-based approaches to problem solving, and collaboration within interdisciplinary teams. These emphases prepare the graduate to participate in a broad range of health professions, as enumerated below in the “Employment Opportunities for Graduates” section.

The MS in Integrated Preclinical Medicine is proposed as an entirely online, distance education program. As such, the total cost of the degree program to the student will be substantially less than that of a traditional Master’s program. Students in the program will enjoy relatively low tuition and can entirely avoid relocation and new living expenses.

Finally, the MS in Integrated Preclinical Medicine may play a role in a future 3-year MD program, which MUSC plans to explore. In this way, the proposed program could help stem the rising cost of medical education and its associated student debt.

## Need for Program in South Carolina

Health science education in South Carolina, as in the rest of the U.S., is expensive for students and for the institutions subsidizing it. Of the 109 post baccalaureate premedical programs in the U.S.,<sup>3</sup> 19 are comparable to the proposed program in terms of their interdisciplinary curricula, program length, and resultant Master’s degree. None of the 19 is located in South Carolina. The mean tuition of those programs, not including fees, living, and relocation expenses, is just under \$39,000. With a total planned student cost of less than \$22,000 for legal residents of South Carolina, the MS in Integrated Preclinical Medicine constitutes a relatively affordable opportunity for South Carolina’s less affluent students to demonstrate their capacity for and commitment to academic achievement in the health sciences.

The proposed Master’s is also needed to prepare graduates for immediate employment in South Carolina’s growing healthcare sector. (See the Employment Opportunities section below.)

## Relationship to Existing Programs at the Medical University of South Carolina

The MS in Integrated Preclinical Medicine is based on the classroom lectures of the preclinical portion (i.e. the first two years) of MUSC’s on-campus integrated MD curriculum. It will also be excellent preparation for MUSC’s Physician’s Assistant, Physical Therapist, Dental, and Pharmacy programs.

<sup>1</sup> “Table 3: Applicants to U.S. Medical Schools by State of Legal Residence, 2001-2012” and “Table 4: Matriculants to U.S. Medical Schools by State of Legal Residence, 2001-2012,” American Association of Medical Colleges (<https://www.aamc.org/data/facts/applicantmatriculant/>).

<sup>2</sup> MUSC Enrollment Management Student database.

<sup>3</sup> “Postbaccalaureate Premedical Programs” database of the American Association of Medical Colleges (<https://services.aamc.org/postbac/>) filtered only as “Graduate” programs.

## Extent to Which Program Duplicates Existing Programs in South Carolina

Because of its unique curriculum and online delivery mode, the MS in Integrated Preclinical Medicine does not duplicate existing programs in South Carolina.

Similar MS programs in the state with ties to biology or health sciences are listed below, with references to what distinguishes them from the proposed program.

Institution	Master's Degree Areas	Distinction(s)
USC – Upstate	Health Sciences (proposed for implementation in Fall, 2014)	On-campus program; traditional basic science courses rather than an integrated curriculum
Clemson University	Biological Sciences and Microbiology	Focused on improving skills of K-12 teachers
USC – Columbia	MS in Biological and Biomedical Sciences	Multi-year, research-oriented degrees
Clayton University	MS in Biotechnology	Focused on forensics and plant life
Winthrop University	MSs in Biology, Psychology, and Nutrition	No basic science for medicine focus
MUSC	MS in Medical Sciences	On-campus program; traditional basic science courses rather than an integrated curriculum

MUSC's College of Graduate Studies is currently seeking approval of an "MS in Medical Sciences." That program is distinct from the MS program proposed here. (1) The MS in Medical Sciences covers the basic sciences in traditional, distinct courses, such as biochemistry, immunology, and histology. The MS in Integrated Preclinical Medicine, proposed here, integrates the teaching of all the basic sciences in each of the courses in the curriculum, which is organized around human physical systems and classes of diseases. (2) All the topics covered in the MS in Integrated Preclinical Medicine curriculum are anchored to clinical scenarios. (3) The MS in Medical Science is an on-campus program. The MS in Integrated Preclinical Medicine, proposed here, will be an entirely online program.

## Program Demand and Productivity

With increasing applications to medical school comes greater desire for educational experiences that distinguish the applicants. This desire and the relatively low cost of the MS in Integrated Preclinical Medicine will drive demand for the proposed program, both within and outside South Carolina. Since this degree is fully online, there are no geographic impediments to enrolling in the program. For these reasons, we believe the demand for this degree will be higher than the capacity at which we plan to staff the program.

Our plan is to grow this program to 200 students by 2019. We can support this capacity with existing MUSC College of Medicine faculty, helped by teaching assistants, to ensure high-quality academic support for students. This program will have students enter and graduate from the program in every academic term. We project that after 2019, completions will fluctuate between 160 and 190 graduates per year.

## Employment Opportunities for Graduates

Most graduates from this MS program are expected to continue their studies with a healthcare professional degree program. However, for those who choose immediately to seek employment, the proposed program will prepare the graduates for positions in the healthcare, biotechnology, pharmaceutical, education, and academic research industries. Projected availability of such positions in the USA and in South Carolina is tabulated below. For some of these positions, such as the Medical and Health Services Managers and the Sales Representatives, the interdisciplinary, clinically focused nature of the proposed program should give the graduate deeper medical insight into the positions than competitors.

United States	Employment		Percent Change	<a href="#">Projected Annual Job Openings *</a>
	2012	2022		
Life, Physical, and Social Science Technicians, All Other	63,900	70,400	+10%	3,160
Medical and Health Services Managers	315,500	388,800	+23%	14,990
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	382,300	419,500	+10%	11,180
Biological Technicians	80,200	88,300	+10%	3,210
Health Technologists and Technicians, All Other	90,400	114,600	+27%	3,310
Biological Science Teachers, Postsecondary	61,400	73,400	+20%	2,120

South Carolina	Employment		Percent Change	Projected Annual Job Openings *
	2010	2020		
Life, Physical, and Social Science Technicians, All Other	220	230	+5%	10
Medical and Health Services Managers	5,000	6,170	+23%	240
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	3,780	4,290	+13%	140
Biological Technicians	430	470	+9%	20
Health Technologists and Technicians, All Other	860	1,050	+22%	40
Biological Science Teachers, Postsecondary	540	640	+17%	20

\* Projected Annual Job Openings refers to the average annual job openings due to growth and net replacement.

[National Data Source: Bureau of Labor Statistics, Office of Occupational Statistics and Employment Projections](#)

[State Data Source: South Carolina Employment Security Commission](#)

## Curriculum

The proposed MS program will comprise twelve courses, which address biomedical foundational concepts, normal physical or mental systems, and diseased systems.

1. Foundations in Biomedical Science	2. Musculoskeletal System	3. Cardiovascular and Respiratory Systems	4. Renal and Gastrointestinal Systems
5. Urogenital and Reproductive Systems	6. Cognition	7. Foundations 2	8. Autoimmunity, Neoplasia, Hematologic Diseases
9. Dermatologic, Pediatric, Reproductive Diseases	10. Renal, Cardiopulmonary Diseases	11. Psychiatric, Neurologic Diseases	12. Metabolic, Gastrointestinal, Endocrine Diseases

The curriculum integrates into these courses the following scientific and medical practice themes: Structure and Function; Homeostasis and Regulation; Molecules and Energetics; Fundamentals of Patient Care; Altered Structure and Function; Pathogens and Host Defense; and Pharmacotherapeutics and Nutrition. The curriculum is designed as a two-year program for the full-time student. Highly motivated students will be able to complete the program in one year. Part-time students can take up to three years to complete the curriculum.

## Articulation and Inter-institutional Cooperation

Because no similar programs are offered by other institutions in the state (or the country), there have been no efforts to link this program to others. However, the innovative nature of this program may open opportunities for program linkages in the future. We would welcome exploring such opportunities with institutions in South Carolina and beyond.

## Estimate of Costs

Program development costs have been projected to be \$830,000. This figure includes \$395,000 pay and fringe benefits for a team of 36 faculty members and 4 administrators, to translate existing lecture content from MUSC's on-campus MD program to an interactive online format. The remaining \$435,000 has been budgeted for creation of original and licensing of existing still and animated graphic media content. These development costs will be funded by clinical revenues. Annual cost to maintain and update the course content (beginning in fiscal year 2016) is projected to be less than \$71,000. Existing faculty will serve as course instructors and teaching assistants. Additional teaching assistants will be hired as necessary and funded entirely from tuition.

END OF DOCUMENT