

Program Planning Summary
for the
Master of Science in Health Sciences
Offered by the
College of Arts and Sciences
of the
University of South Carolina Upstate

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**Program Planning Summary
Master of Science in Health Sciences
University of South Carolina Upstate**

Program Designation

Institution:	University of South Carolina Upstate (<i>in conjunction with the Edward Via College of Osteopathic Medicine</i>)
Academic Unit:	Division of Natural Sciences and Engineering, College of Arts and Sciences
Name of program:	Master of Science in Health Sciences
Date of Implementation:	Fall 2014
CIP Code:	260102
Identification:	New program
Number of Credit Hours:	38

Curriculum Outline

The Master of Science in Health Sciences will be a new degree program requiring a minimum of 38 credit hours beyond the Bachelor's degree offered in conjunction with the Edward Via College of Osteopathic Medicine (VCOM) campus located in Spartanburg, SC. The curriculum combines didactic and seminar courses offered at both USC Upstate and VCOM. The program is designed to be completed in as few as 2 years. Students complete three didactic courses (biochemistry, genetics, and microbiology) at VCOM in the first semester in addition to a journal club and seminar course. Laboratory rotations (a minimum of two) will begin at the end of the first semester and continue until the student has identified a mentor and thesis project. Didactic courses in the second semester (biostatistics, medicinal chemistry, and an elective) will be conducted at USC Upstate along with journal club and seminar. Students are expected to continue research throughout the intervening summer and into the third and fourth semesters. Any remaining elective courses will be completed at USC Upstate in the final year, but the majority of credit hours will be reserved for research and thesis preparation.

USC Upstate courses that are included in this program will be cross-listed with undergraduate courses currently offered but modified so that graduate students will be required to complete extra work to reflect the rigor of graduate school. Graduate students will not complete the lab component since, as with most graduate programs in biological sciences, specific laboratory techniques are instead learned in laboratory rotations and in the laboratory chosen to complete research for the thesis. Courses offered at VCOM will be taken alongside the medical students, allowing for a unique perspective and focus. Lab rotations and research required for the thesis component can be conducted with faculty members of either school and on either campus. Graduates of this program will develop a strong understanding of contemporary and cutting-edge biomedical laboratory techniques which will increase their employability in today's aggressive job market by expanding opportunities beyond the baccalaureate to include higher-paying biotechnology positions, academic instructors and more competitive applications to health professional schools and doctoral programs.

Program Justification

Completion of this program will enhance students' marketability for careers in hospital, industrial, pharmaceutical, and academic laboratories. SCBIO, an organization that fosters life sciences companies and endeavors throughout South Carolina, reports that "more than 572 (life sciences) companies and institutions employ 13,520 people with an average annual wage of \$53,275 in South Carolina. Life science businesses and institutions impact 46,032 jobs,

according to a 2010 study by the Battelle Institute.”¹ This wage represents an approximate 84% increase in the median statewide wage.² The biotechnology industry has seen steady growth in the Upstate in recent years, and job growth in this industry in SC is predicted to increase by about 30% from 2010 to 2020.³ Students from this program will be more competitive for positions at local (and national) biotechnology companies such as Kiyatec (Greenville), Nephron Pharmaceuticals (near Columbia), Ritedose Corp. (Columbia) and Ortec Inc. (Easley). Furthermore, with the recent signing of the joint research agreement between Greenville Health System and Clemson University, the collaborative effort is expected to “increase faculty recruitment in biomedical sciences and double health care research funding within the next four years.”⁴ The proposed MS program would be poised to provide this initiative an experienced biomedical work force, and given that there are currently few opportunities for such training in the Upstate, it will operate to rectify this deficiency.

In addition, with 18+ didactic credit hours required in biology, students would be eligible to teach at the collegiate level. Replete with several institutions of higher learning, the Upstate region would be ideal for graduates of this Master’s program to seek adjunct or full-time instructor positions at technical schools, colleges and universities. Indeed, a quick job search of Upstate institutions revealed at least 15 open adjunct faculty positions at institutions such as Tri County Technical College, North Greenville University and Anderson University. Furthermore, as doctoral programs in the biological sciences become more and more competitive, students wishing to pursue entry into Ph.D. programs may bolster their applications by first earning a Master’s Degree in the health sciences.

Anticipated Program Demand and Productivity

This unique program will provide students with a biomedical-focused curriculum and experience in a medical school classroom. As nearly 20% of each entering class at VCOM has pursued a post-baccalaureate (postbac) education, implementation of a MS program at USC-Upstate would provide students a superior alternative to a certificate-driven postbac program. The added laboratory experience will be very attractive to pre-medical students given that medical school admissions takes into account such preparation and many residency programs are requiring more evidence-based medicine in the training regimen. Given the large population of biology students in the Upstate from USC Upstate (~400 majors), Wofford College (~100 majors), Converse College (~30 majors), Limestone College (~60 majors), Furman University (~200 majors), Clemson University (~1,200 majors), and Winthrop University (~250 majors)⁵ the demand will likely outpace admissions. A quick survey of USC Upstate majors indicated that 15 students would be interested in pursuing this program. Currently, the program could accommodate up to 14 students given that the number of faculty pursuing scholarship in areas of biomedical science are ~4 at USC Upstate, 8 at VCOM and 2 at Gibbs Research Institute. Recently, VCOM has partnered with the Gibbs Cancer Center at Spartanburg Regional Hospital to create the Gibbs Research Institute. This site will offer students in the MS program the opportunity to conduct quality research under the guidance of GRI faculty. With plans to expand the VCOM faculty by 2 next year and 20 at GRI over the next five years, the program will offer students numerous options in biomedical research and permit the program to steadily grow in size. Recruitment through both USC Upstate and VCOM admissions departments will ensure maximum promotion and advertising of the program. And since USC Upstate will grant the degree, tuition at a public institution will be appealing.

¹ From www.scbio.org

² From Oladipo, J. (2012, October 5) Biotech focuses on new trends in healthcare *Spartanburg Journal* pg. 15.

³ From USC Upstate Metropolitan Studies Institute

⁴ From <http://www.clemson.edu/media-relations/4932/clemson-ghs-create-healthcare-research-powerhouse/>

⁵ From respective institutional websites.

Program Duplication

This Master of Science in Health Sciences degree will introduce a unique combination of coursework and biomedical research that is currently not available in the state of South Carolina. This uniqueness of the program will allow the graduates to be more competitive for medical school admission than those who have participated in a nonthesis, certificate postbac program. Indeed, USC Columbia offers a M.S. in Biomedical Sciences, but their program is more narrowly focused and requires that students declare one of three concentration tracks (biochemistry/molecular biology, neuroscience, or biotechnology). The program proposed here carries a broader scope in the core classes and includes opportunities to focus on specific areas in the elective courses. Furthermore, students taking courses at VCOM will be enrolled in classes with the osteopathic medical students, another advantage when compared to other postbac or MS programs. The degree proposed here is strictly research-based as it does not include a Library Thesis option as does the program at USC Columbia. The Medical University of South Carolina offers Master's Degrees in a number of specialized areas (biochemistry/molecular biology, immunology, biostatistics/epidemiology, bioinformatics, cell and molecular pharmacology, neurosciences, pathology), but again these are more narrowly focused and would not duplicate the program in this proposal. Claflin University offers a Master of Science in Biotechnology, but the three tracks (forensic biotechnology, plant biotechnology, and bioinformatics) differ in focus from the program outlined here and therefore do not duplicate it. The Master's Degree in Biological Sciences offered at Clemson University does not overlap this program since its three tracks focus on ecology and evolutionary biology, cell and developmental biology, and comparative organismal biology. Thus, this proposed MS program provides the graduates with a broad educational experience in the biomedical sciences and valuable training in the laboratory so as to expand their options for employment and academic achievement.

Relationship to Other Programs at USC Upstate

The Division of Natural Sciences and Engineering at USC Upstate offers a B.S. in biology, and our graduates would be perfectly suited to enroll in this program. Students who complete their Biology degrees at Upstate and take courses listed in this program as undergraduates would not be eligible to re-take the same courses for graduate credit. Elective courses would allow for flexibility for these students.

Relationship to Programs at Other Institutions

This program will be offered in conjunction with VCOM which has its campus and research facilities located within 5 miles of USC Upstate, providing ease in administration of the program and collaboration on research and teaching. This program will be attractive to graduates of biology (and possibly chemistry) programs within the Upstate region and beyond. However, we have no formal relationship with programs at other institutions at this time.

Total New Costs Associated with the Proposed Program

The proposed program is structured such that each student would have a research advisor and a 3-5 member thesis committee. We anticipate that service in either or both of these roles, as well as the extra work involved for faculty teaching the graduate classes, will result in course reallocations for faculty participating in the program in accordance with the policies of the Upstate Graduate Committee or as outlined in the forthcoming Policies and Procedures document. This will necessitate the hiring of at least one additional faculty at the full-time, tenure-track level. In addition, we envision having a faculty member serve as Program Coordinator to oversee student progression through the program, serve as the academic advisor, and provide other administrative support for the program. Service in this position will also require course reallocations and may necessitate the hiring of additional adjunct faculty.