

Background Information

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

The proposed changes are:

1. Renaming of our Master of Sciences Program in Mathematics to *Master of Science Program in Mathematical Sciences*; and
2. Creating two concentrations, one on Mathematics and one in Statistics, within the newly renamed program.

Our Master of Sciences Program has been in place for over twenty years. On average, the Program has about twenty actively enrolled students, and graduates about seven students per year. The growth of the Charleston area and the growth in the number of new high-tech companies have resulted in substantially increased demand for graduate education in Statistics. Moreover, strong interest in Statistics by many of our current students over the years has led to a large number of course offerings in Probability and Statistics topics. Consequently, the structure of our current program allows for the equivalent of a concentration in Statistics and a concentration in Mathematics. The proposal would formalize these two existing coherent curricular choices as concentrations with the appropriate titles: Mathematics and Statistics, following a change in name from *Master of Science in Mathematics* degree to a *Master of Science in Mathematical Sciences* degree. We regard Mathematical Sciences as the common umbrella under which Mathematics (Pure and Applied) and Statistics fit. (See, for a similar categorization, the Division of Mathematical Sciences at the National Science Foundation, which houses Pure, Applied, and Computational Mathematics Programs, and the Statistics Program.) The proposed structure would allow additional concentrations, should need and interest arise in the future. The proposed change is central to our mission of providing high quality higher education in the Mathematical Sciences to serve the region, by training workers from local industry and businesses, and by supplying them with highly skilled employees.

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

The objectives of the modified program are two-fold.

1. First and foremost, we plan to continue to provide a high quality master's level degree in mathematics.
2. Second, the proposed modifications will formalize the two existing coherent curricular choices as two concentrations: Mathematics and Statistics. In order to avoid the confusion that might arise by keeping the current degree name (*Master of Science in Mathematics*), the modified degree name will be changed to *Master of Science in Mathematical Sciences*.

The modified program will have the following *Student Learning Objectives*:

Students who complete the Program will (1) have acquired a broad knowledge base, together with more specialized training in the chosen area of concentration, (2) and be prepared for immediate employment and career advancement in in industry, academia or government, or for continuing their study at the doctoral level.

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 Charleston area is undergoing unprecedented growth, attracting new employers, including a burgeoning technological sector. This has substantially increased demand for graduate-level offerings and programs in STEM disciplines, to maintain competitiveness and attract employees to the area, as brought to attention by numerous Lowcountry citizens, educators, and business and community leaders. (See *Charleston IT Industry Profile and Higher Education Impact Study*, Charleston Regional Development Alliance at <http://www.crdp.org/news/>) For example, Don Bailey, Chief Executive Officer at SPAWAR said recently: “*Many of our engineers seek post-graduate education to enhance their knowledge and further their careers. SPAWAR Charleston fully recognizes the value of higher education and often assists our employees with tuition benefits to nurture their quest for higher technical education.*” Allen Craig, Greater Charleston Chamber of Commerce, agreed that due to scarcity of local post-graduate educational opportunities, especially in STEM fields, companies in the Charleston region report difficulty in recruiting. Currently the Mathematics Department offers a wide variety of graduate-level courses in Statistics, effectively providing the equivalent of a concentration in Mathematical Statistics. By formalizing the existing mathematical statistics focus, the proposed program modification would address the lack of a face-to-face graduate level degree in statistics for the growing regional student population wanting this type of training. The fact that, since 2010, about half of our students have chosen to focus on statistics, and the numerous inquiries (at least a dozen in the past year) about on-campus graduate statistics training, are clear evidence of such need. This is understandable, given that our program offers a blend of theory and applications best done in a classroom setting, especially for those students who have been out of school for a few years.

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

Yes

No

If yes, explain. (1000 characters)

The proposed modification will likely increase the number of students seeking graduate-level training in the Mathematical Sciences at the College of Charleston. It is expected that several of the courses that are relevant to both of the proposed concentrations will experience increased enrollments. The proposed modification is not expected to result in the need of additional sections of graduate-level courses, but is expected to lead to more robust enrollments and more consistent course rotation offerings.

The proposed modification is expected to also increase the number of undergraduate majors in the 4+1 BS/MS degree. Those students pursuing the joint program will have the option of choosing one or the other concentration when creating a Plan of Study upon admission to the joint program.

List of Similar Programs in South Carolina

| Program Name | Institution | Similarities | Differences |
|--|--|---|---|
| Master's Program in Biostatistics. | Medical University of South Carolina, Department of Public Health Sciences | Currently MUSC Biostatistics students can take our graduate courses and vice versa. This mutual agreement is expected to broaden with the proposed modification. | The MUSC Biostatistics MS is "focused on biomedical data and its collection, analysis and interpretation". The proposed Concentration will prepare students for a wider range of careers. |
| Master's Program in Statistics. | University of South Carolina, Department of Statistics. | The USC MS Program in Statistics prepares students for a variety of careers, as well as for further graduate studies. | Most applicants to the USC graduate program are international, given the focus on doctoral degrees. The proposed Concentration will primarily target residents of the Lowcountry. |
| Master's Distance Program in Applied Statistics. | University of South Carolina, Department of Statistics. | The USC Distance Program in Applied Statistics targets individuals who are already in the workforce. As stated on the Program website: "While some theory is introduced, the focus is on the application of statistics and how statistics can be used to improve the quality of an organization's processes." | Our proposed program is a traditional face-to-face program offering evening classes to accommodate a diverse student population, and providing on-campus education with close faculty-student interaction. The proposed Statistics concentration will be in Mathematical Statistics, combining a solid theoretical foundation and applied training to serve students who plan to go on to doctoral programs, seek immediate employment or career advancement in industry or labs, or pursue teaching opportunities in Statistics at 2- and 4-year colleges. |
| Master's Program in Mathematical Sciences | Clemson University, Department of Mathematical Sciences | Breadth and flexibility of the program. Clemson's MS Program requires breadth of coursework together with an identifiable concentration (e.g. Statistics). | Clemson's graduate offerings are primarily focused on their doctoral program, and their MS students typically continue in their doctoral program. Clemson University's location is geographically distant from Charleston's metropolitan area and its surrounding region, thus our program serves a different student base. |

Description of the Program

| Projected New Enrollment | | | | | | |
|---------------------------------|-------------|--------------|---------------|--------------|---------------|--------------|
| Year | Fall | | Spring | | Summer | |
| | Headcount | Credit Hours | Headcount | Credit Hours | Headcount | Credit Hours |
| 2015 | 7 | 33 | 7 | 33 | 7 | 21 |
| 2016 | 9 | 39 | 9 | 39 | 9 | 27 |
| 2017 | 13 | 57 | 13 | 57 | 13 | 39 |
| 2018 | 18 | 72 | 18 | 72 | 18 | 54 |
| 2019 | 24 | 96 | 24 | 96 | 24 | 72 |

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 |
|--|---------------------------------|
| None | None |

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)

The increased enrollment will result in higher, but manageable enrollments in existing courses, so we do not anticipate need for additional faculty lines.

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)

Classes will continue to be held in the evening hours during which there is no shortage of classrooms. We have sufficient infrastructure and technological resources to handle the increased enrollment in Statistics courses. In particular, no additional Library or software resources will be needed.

Financial Support

| Estimated New Costs by Year | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------|
| Category | 1st | 2nd | 3rd | 4th | 5th | Total |
| Program Administration | 0 | 0 | 0 | \$1,000 | \$1,000 | \$2,000 |
| Faculty and Staff Salaries | 0 | 0 | 0 | 0 | 0 | 0 |
| 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 | \$500 | \$500 | \$1,000 |
| Library Resources | 0 | 0 | 0 | 0 | 0 | 0 |
| Other* | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | \$1,500 | \$1,500 | \$3,000 |
| Sources of Financing | | | | | | |
| Category | 1st | 2nd | 3rd | 4th | 5th | Total |
| Tuition Funding | \$27,753 | \$33,495 | \$48,807 | \$63,162 | \$84,216 | \$257,433 |
| 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 | \$27,753 | \$33,495 | \$48,807 | \$63,162 | \$84,216 | \$257,433 |
| Net Total (i.e., Sources of Financing Minus Estimated New Costs) | \$27,753 | \$33,495 | \$48,807 | \$61,662 | \$82,716 | \$254,433 |

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

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.

Note: We made a cautious estimate that the proposed concentration in Statistics will slowly ramp up from 2 full-time and 5 part-time students in Year 1 to 4 full-time and 20 part-time students in Year 5. We expect Year 1 recruitment to be dominated by students realigning to the new concentration, and thus the net gain is estimated to be low. Interest expressed by local businesses and members of the local workforce in informal conversations points at a steady state of higher than 20 part-time students. Such an increase is expected to almost double the already robust number of graduate majors in our Master's program. (Currently our Master program has over 20 students, with a three-year average of around 15, and graduates 5-10 students per year.)

We used the following very conservative estimate: part-time students will take one 3-credit course during each of the Fall, Spring, and Summer term, while full-time students will take 9 credits during each of the Fall and Spring terms, and 3 credits during Summer term. Tuition fees are taken to be the current \$319 per credit hour (budgeting for no increase in the following years).

Evaluation and Assessment

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

Yes

No

If yes, explain. (1000 characters)

The evaluation and assessment of the modified MS Program will also include Concentration-specific measures as well as of the Program as a whole.

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

X 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.