

There is no plan for study abroad at this time.

2.0 PROGRAM ADMINISTRATION

- 2.1 Detail any specific admission requirements that differ from those already in place in the college/school/center in which the proposed program will be offered.

Students entering the MS in Biostatistics and Health Analytics program should have taken the following courses: introductory statistics, three semesters of calculus, linear algebra, and one course in programming.

- 2.2 Confirm that the proposal has been reviewed by the University Registrar and that related issues and concerns (e.g. system configuration, curriculum requirements, course availability/available seats, course sequencing, pre-requisites, classroom availability, etc.) have been satisfactorily addressed.

See the attached letter from the registrar.

- 2.3 Detail any mentoring needs/requirements that differ from those for other programs in the college/school/center in which the proposed program will be offered. Confirm that the proposal has been reviewed by the appropriate college/school mentoring coordinator or committee and that mentoring- related issues and concerns have been satisfactorily addressed.

Advising needs for this major will not differ from the advising needs of the College for Public Health and Social Justice.

- 2.4 Detail the administrative structure for the program, indicating if any additional staffing will be required within five years. Consider support functions, internship/clinical experience placement and coordination, etc.

No additional administrative structure is required.

- 2.5 Does this proposal necessitate and include the creation (either immediately or within five years) of a new academic department, or significant modification of an existing one(s)? If so, explain.

The proposed degree will be offered by the Department of Epidemiology and Biostatistics in the College for Public Health and Social Justice.

3.0 PEDAGOGY / CURRICULUM / ACADEMIC REQUIREMENTS

- 3.1 Describe the educational delivery method(s) of the program (e.g., face-to-face, distance/web, hybrid) and the pedagogical rationale for that method(s) in light of the student population(s) you intend to serve.

Most courses will be taught using traditional face-to-face lectures, supplemented with laboratory experiences offering hands-on programming and data analysis training. The PUBH 5010 course is usually offered in an on-line format.

- 3.2 Use the table in Appendix A to detail all course requirements for the program.

See Appendix A

- 3.3 Use the Table in Appendix B to describe all non-course program requirements (e.g., residency requirements, proficiency requirements, information literacy requirements, portfolio requirements, examination requirements, entering/continuing/graduating GPA requirements, etc.).

See Appendix B

- 3.4 Describe the curricular logic driving the selection and timing of courses and other requirements. Are these various curricular elements intentionally taught and sequenced to complement and augment each other? If so, explain how and why.

The curriculum plan and timing of courses are similar across other master's programs in the country and are guided by the American Statistical Association. The proposed degree program will follow curricular tracking requirements to ensure that students are prepared for progressively higher-level courses. For example, Theory of Biostatistics I and II will precede advanced biostatistics courses. The statistical programming class is a prerequisite for all applied biostatistics courses. The program provides a balance between theory, applications, and computing.

- 3.5 How do the curriculum and program structure compare with that of similar programs offered by competitor and/or benchmark institutions? Explain the rationale for either similarity or distinctiveness.

The curriculum is similar to that offered by other similar programs in other schools of public health.

- 3.6 The U.S. Department of Education's "Classification of Instructional Programs" is a taxonomic scheme that supports the tracking and reporting of academic fields of study and enrollment in/completion of all programs. Accordingly, all SLU academic programs must be assigned a CIP code. Please utilize the "CIP Selector" located on the following webpage to select the appropriate six-digit CIP code and description for the proposed program:

<http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55> . Enter that code and description below:

26.1102 Biostatistics

4.0 STUDENT LEARNING OUTCOMES AND ASSESSMENT PLAN

4.1 Student Learning Outcomes Assessment Plan

Complete the table below to provide an overview of your plan to assess student progress toward achievement of desired program-level learning outcomes. Note that results of evaluations of student performance against each learning outcome identified below will be reviewed as part of all college/school/center-level and University-level program reviews.

<p>Program-Level Student Learning Outcomes</p> <p><i>What are the most important (no more than five) specific learning outcomes you intend for all program completers to be able to <u>achieve and demonstrate</u> upon completion of the program?</i></p>	<p>Evaluation Method</p> <p><i>How will students document/demonstrate their performance toward achievement of the learning outcomes? How will you measure student performance toward achievement of the learning outcomes?</i></p> <p><i>Describe any use of <u>direct</u> measures: capstone experiences/courses, standardized exams, comprehensive exams, dissertations, licensure exams, locally developed exams, portfolio reviews, course-embedded assessments, etc.</i></p> <p><i>Describe any use of <u>indirect</u> measures: student, alumni or employer surveys (including satisfaction surveys); exit interviews/focus groups with grads; retention/transfer studies; graduation rates; job placement/grad school admission rates; etc.</i></p>	<p>Use of Assessment Data</p> <p><i>How and when will student performance data be analyzed and then used to “close the assessment loop” and inform <u>program improvement</u>? How will you document that?</i></p>
<p>MS-BSTHA 1:</p> <p>DESIGN</p> <p>Students should be able to design experiments or data collection strategies to answer research questions in public health.</p>	<p>Direct Measures:</p> <ol style="list-style-type: none"> Aspects of design related to sample size calculation will be assessed in <u>BST 4200</u> (Theory of Biostatistics II). The graduate students in BST 4200 will be required to do a project involving the determination of the needed sample size. The project will involve a written report and an oral presentation. Students must compute the required sample size for a practical situation. This will be evaluated by the written report and performance on a portion of the final exam devoted to sample size determination. We will develop a rubric for these measures in BST 4200 to assess whether the students meet or fail to meet expectations. Other aspects of design will be assessed at the presentation in <u>BST 5965</u> (Capstone Project in Biostatistics) where students will be required to <ol style="list-style-type: none"> pose a research question, describe the data collection strategy for their project. justify their choice of the data collection strategy. <p>These will be evaluated from the student’s written report and oral presentation. We will develop a rubric for these and all other measures described below for BST 5965 to assess whether the students meet or fail to meet expectations.</p>	<p>Each spring the program director will collect data on whether students meet or fail to meet expectations for each of the three designated courses (4200, 5100, and 5400) as well as for the capstone project (5965). The results will be discussed by the program director and the chair of the Department of Epidemiology and Biostatistics. A summary of the findings will be distributed to the biostatistics faculty.</p>
<p>MS-BSTHA 2:</p> <p>DATA AND COMPUTING</p> <p>Students will use the appropriate software to manage and analyze data.</p>	<p>Direct Measures:</p> <ol style="list-style-type: none"> In <u>BST 5400</u> (Applied Data Management) students must demonstrate that they can acquire a data set and manage it so that it can be analyzed by at least one software package. (Currently, the package is SAS.) This will be evaluated using a term project in BST 5400. We will develop a rubric for these measures in BST 5400 to assess whether the students meet or fail to meet expectations. In the capstone project presentation for <u>BST 5965</u> students will be required to acquire and manage the data used for the project. This will be evaluated from the student’s written report and oral presentation. 	<p>Concerns regarding the these results will be discussed with the biostatistics faculty at a faculty meeting.</p>
<p>MS-BSTHA 3:</p> <p>ANALYSIS</p> <p>Students will develop statistical models for data and make inferences to answer research questions in public health.</p>	<p>Direct Measures:</p> <ol style="list-style-type: none"> In <u>BST 5100</u> (General Linear Models) students must: <ol style="list-style-type: none"> choose a problem in public health and pose a research question. select a model for the data. make inferences to address the research question. <p>These will be evaluated from the student’s written report in BST 5100. We will develop a rubric for these measures in BST 5100 to assess whether the students meet or fail to meet expectations.</p> <ol style="list-style-type: none"> In <u>BST 5965</u> (Capstone Project in Biostatistics) students must: <ol style="list-style-type: none"> choose a problem in public health and pose a research question. 	

	<p>2b) select a model for the data.</p> <p>2c) make inferences to address the research question.</p> <p>These will be evaluated from the student’s written report and oral presentation.</p> <p>Note: The measures are identical for the reports in BST 5100 (General Linear Models) and BST 5965 (Capstone Project in Biostatistics), but the level of model complexity will differ. In BST 5100 only multiple linear regression and logistic regression are expected because this is the extent of the course content. More complicated models are expected for BST 5965.</p>	
<p>MS-BSTHA 4: COMMUNICATION</p> <p>Students will describe the process of data collection, and convey the results of statistical analysis, both orally and in writing.</p>	<p>Direct Measures:</p> <p>In BST 5965 (Capstone Project in Biostatistics) will demonstrate both orally and in writing all of the aspects of a data analysis project.</p> <ol style="list-style-type: none"> 1. Students will explain and justify the data collection strategy. 2. Students will explain how data were managed and prepared for analysis. 3. Students will explain the choice of a statistical model. 4. Students will make inferences to answer the research question. <p>These will be evaluated from the student’s written report and oral presentation.</p>	

Summary of Assessment Points

A typical program of study, showing the assessment points for MS in Biostatistics and Health Analytics, is given below. First year assessments are done in three of the required courses and are highlighted in **yellow**; assessments done at the capstone are highlighted in **green**.

Year	Fall	Spring
First	<p>BST 4100: Theory of Biostatistics I (3)</p> <p>BST 5030: Statistical Programming and Study Planning: SAS (3) *</p> <p>BST 5400: Applied Data Management (3)</p> <p>MS-BSTHA 2 Data and Computing (assessment point)</p>	<p>BST 4200: Theory of Biostatistics II (3)</p> <p>MS-BSTHA 1 Design (assessment point)</p> <p>BST 5100: General Linear Models (3)</p> <p>MS-BSTHA 3 Analysis (assessment point)</p> <p>PUBH 5030: Methodological Approaches to Understanding Population Health (3)</p>
Second	<p>BST5200: Survival Data Analysis (3)</p> <p>PUBH 5010: Mission and Practice of Global Health (2)</p> <p>BST xxxx: Biostatistics Elective</p>	<p>BST xxxx: Biostatistics Elective (3)</p> <p>BST 4500: Statistical Learning (3)</p> <p>BST 5965: Capstone Project in Biostatistics</p> <p>MS-BSTHA 1 Design (assessment point)</p> <p>MS-BSTHA 2 Data and Computing (assessment point)</p> <p>MS-BSTHA 3 Analysis (assessment point)</p> <p>MS-BSTHA 4 Communication (assessment point)</p>

4.2 Curriculum Mapping

Level I	Level II	Level III
<ul style="list-style-type: none"> ▪ <i>Knowledge & Comprehension:</i> Recall data or information; understand the meaning, translation, interpolations, and interpretation of instructions and problems; state a problem in one's own words. 	<ul style="list-style-type: none"> ▪ <i>Application:</i> Use a concept in new situations; unprompted use of an abstraction. Application of knowledge in novel situations. ▪ <i>Analysis:</i> Separates material or concepts into component parts so organizational structure may be understood. Distinguishes facts from inferences. 	<ul style="list-style-type: none"> ▪ <i>Synthesis:</i> Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure. ▪ <i>Evaluation:</i> Make judgments about the value of ideas or materials.

Courses Offered by Home Department or College of Proposed Major: Required Courses

Major or Minor Student Learning Outcomes	BST 4100*	BST 4200*	BST 4500*	BST 5400	BST 5030	BST 5100	BST 5200	BST 5965	PUBH 5010	PUBH 5030
MS-BSTHA 1: DESIGN Students should be able to design experiments or data collection strategies to answer research questions in public health.		II		I				II	I	II
MS-BSTHA 2: DATA AND COMPUTING Students will use the appropriate software to manage and analyze data.			II	II	II	I		II		
MS-BSTHA 3: ANALYSIS Students will develop statistical models for data and make inferences to answer research questions in public health.	I	II	II			II	II	III		
MS-BSTHA 4: COMMUNICATION Students will describe the process of data collection, and convey the results of statistical analysis, both orally and in writing.						I		III		

* See Appendix A Curriculum for a justification of 4000 level courses

Elective Courses

Major or Minor Student Learning Outcomes	BST 5210	BST 5220	BST 5230	BST 5420	BST 5930	BST 6100	BST 6200
MS-BSTHA 1: DESIGN Students should be able to design experiments or data collection strategies to answer research questions in public health.				III			
MS-BSTHA 2: DATA AND COMPUTING Students will use the appropriate software to manage and analyze data.					II		
MS-BSTHA 3: ANALYSIS Students will develop statistical models for data and make inferences to answer research questions in public health.	II	II	II	II	II	II	II
MS-BSTHA 4: COMMUNICATION Students will describe the process of data collection, and convey the results of statistical analysis, both orally and in writing.							

Program Courses Offered by Other Departments:

All required and elective courses carry the course designator BST (Biostatistics) except PUBH 5010 Mission and Practice of Global Health and PUBH 5030 Methodological Approaches to Understanding Population Health. BST courses are offered by the Department of Epidemiology and Biostatistics in the College for Public Health and Social Justice. PUBH 5010 and PUBH 5030 is offered by the College for Public Health and Social Justice; instructors can be from any department in the college.

5.0 ADDITIONAL GOALS AND ASSESSMENT PLAN

- 5.1 Detail any additional program goals (other than learning outcomes) – e.g., student retention and graduation rates, program rankings, faculty productivity, etc. — and specific annual performance targets. Additionally, summarize assessment methods for measuring progress. Performance toward each target noted will be evaluated as part of all program reviews.

No additional goals need to be added.