TO: The Academic Senate
FROM: Committee on Instruction and Curriculum (CIC)
SUBJECT: 15-16 CIC 74: Revision request for Biostatistics M.S.
PURPOSE: Information to the Academic Senate
ACTION REQUESTED: That the Senate accept the information that the revision request for M.S. Biostatistics program and its concentrations has been approved by CIC.

BACKGROUND INFORMATION:
The Senate process for approving transformed degree programs for the semester calendar is defined by 14-15 CIC 36. The Graduate Programs Subcommittee unanimously approved the M.S. Biostatistics program at its meeting on May 12 with the acknowledgement that some non-substantive changes may occur in the Catalog copy. The program was approved by consent of CIC per the policy on June 6, 2016. The proposal may be viewed within Curriculog; per the request of ExCom, a PDF attachment with information from Curriculog is provided.
Master of Science in Biostatistics

1. Semester Conversion Request for Approval of Revision of the Graduate Degree Program/Major

General Catalog Information

Please see the Guidelines for Master's Program Conversion

Select Shared Core unless otherwise instructed by APGS

Select SHARED CORE*
- Program
- Shared Core

First Year of Offering: Fall 2018
Effective Catalog: 2018-2019

Notes: If you want to move an existing degree program to online (i.e. 50% or more of the program can be completed online (a hybris course counts as .50 online), elevate an option to a degree, or change the degree type, please e-mail Donna Wiley, Interim Associate Vice President, Academic Programs and Graduate Studies; and copy Sarah Aubert, Catalog and Curriculum Specialist, Academic Programs and Graduate Studies; for additional instructions as soon as possible.

Department: Department of Statistics and Biostatistics

Full and exact title of Major including degree earned:* Master of Science in Biostatistics

Has your program received transformation funding? Yes No

If the program received transformation funding, please summarize the transformative changes made:
Most required courses are now 4 semester units. Some requirements and all electives are 2 units. This allows for a stronger core and greater flexibility for the students. Introduction of new courses, including BSTA 668 and STAT 641 into the curriculum.

Program Description

The Department of Statistics and Biostatistics offers graduate study leading to the degree Master of Science in Biostatistics. The program is designed to serve the needs of students with varying backgrounds in Statistics, Biological Sciences, Public Health, Computer Science, Mathematics and other sciences. The program includes curriculum designed to prepare students to work in the pharmaceutical and biotech industries. All students are expected to master a wide variety of applied statistical and probabilistic techniques and the theoretical foundations on which these techniques rest. They are expected to be familiar with recent developments and to be able to use the statistical literature to learn new techniques and theories throughout their professional careers. In addition to the general requirements stated elsewhere in this catalog, a student must satisfy the departmental requirements stated in the following paragraphs.

Career Opportunities

Statistician, Biostatistician, Data Analyst, Data Scientist, Teacher.

Admission Requirements

1. A baccalaureate degree or equivalent.
2. Differential and Integral Calculus (MATH 130, 131).
3. Departmental approval.

In addition to the above minimal requirements for admission, if students have some of the following background they will be at an advantage both as to selection for admission to the program and optimal progress toward the degree if admitted:

- interest or experience in a setting where studies or experiments are conducted for the collection of data.
- multiple integration and infinite series
- matrix algebra
basic statistics and probability
knowledge of a computer programming language

Student Standing and Progress Toward the Degree

Advancement to Candidacy Requirements

1. Completion of at least 16 semester units of approved coursework beyond the baccalaureate, with an average of "B" (3.0) or higher.
2. Fulfillment of the University Writing Skills Requirement. For information on meeting the University Writing Skills Requirement, see the Testing Office website at www.csueastbay.edu/testing or call 510.885.3661.
3. Departmental approval.

Cause for Dismissal from Program

Students may be dismissed from the program at any time "for cause." "For cause" includes, but is not limited to, poor academic performance, violation of the student code of conduct, academic dishonesty, and/or interference with the educational environment.

Program Learning Outcomes

Students graduating with an M.S. in Biostatistics from Cal State East Bay will be able to:

1. Apply statistical methodologies, including a) descriptive statistics and graphical displays, b) probability models for uncertainty, stochastic processes, and distribution theory, c) hypothesis testing and confidence intervals, d) ANOVA and regression models (including linear, and multiple linear) and analysis of residuals from models and trends.
2. Derive basic theory and communicate to others results involving biostatistical data analysis.

Formulate problem solutions, produce appropriate computer code and interpret results.
Foundation Requirements

The M.S. in Biostatistics program consists of at least 32 semester units of approved upper division and graduate work. The university requirement for the minimum number of 600-level units applies. All work applied toward the 32 units must be at an average grade of "B" (3.0) or higher. No graduate-level required course may be at a grade below "B-.”

Core Courses (26 units)

BSTA 661 Categorical Data Analysis
BSTA 662 Survival Analysis
BSTA 663 Clinical Trials in the Pharmaceutical and Biomedical Industries
STAT 620 Probability and Statistical Theory
STAT 630 Statistical Methods
STAT 631 Analysis of Variance
STAT 632 Linear and Logistic Regression
STAT 640 Mathematical Statistics

Electives (4 units)

Select two (2) from the following:

BSTA 668 Longitudinal Data Analysis
STAT 641 Bootstrap
STAT 650 Advanced R for Data Science
STAT 660 Advanced SAS Programming
STAT 675 Advanced Stochastic Processes and Simulation

Capstone (2 units)

STAT 692 Comprehensive Exam Review

To revise an existing concentration (formerly option) or create a new concentration, select form 1a. Semester Conversion Request for Approval of New or Revised Graduate Concentration.
Total Units Required

<table>
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<tr>
<th>Quarter Based Program:</th>
<th>Semester Based Program:</th>
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<tbody>
<tr>
<td>48</td>
<td>32</td>
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Comprehensive Examination

Successful completion of a departmental examination is required. This written examination will cover the contents of the courses in the candidate’s approved program. Other material may be included, the general nature of which will be specified in advance. The examination is given only in the Fall and Spring semesters, and will cover both applied and theoretical topics. Students may take STAT 692 to receive a maximum of 2 units of academic credit for preparation for the comprehensive examination.

In each semester of offering, the Department Chair will appoint three or more members of the graduate faculty to administer the examination. Each student will generally take the Comprehensive Examination in the semester of intended graduation or in the preceding semester, after consulting with the graduate advisor. The examination committee is the final departmental authority in deciding eligibility to take the examination.

Is this major approved as an online degree program? * 

- Yes
- No

If no, is there any pathway in the revised degree that is more than 50% online? 

- Yes
- No

Resource implications of the proposed revision, if any: 

N/A

Relationship of Revised Program to requirements
Consultation with other affected departments and programs:

The following department(s) has (have) been consulted and raised no objections:

All affected academic departments and programs at CSUEB were consulted and there were no objections.

The following department(s) has (have) been consulted and raised concerns:

None

Attachments

Did you attach your Curriculum Maps, Five Year Assessment Plan or other supporting documents to this proposal?

☑️ Yes

☐ No

Please scroll to the top of this form and select the Files icon to attach the following documents to your proposal:
Catalog Item Types

<table>
<thead>
<tr>
<th>Degree Type</th>
<th>Master of Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Type</td>
<td>Master</td>
</tr>
</tbody>
</table>
Attachments for Master of Science in Biostatistics

- **Biostatistics five-year-plan.docx** (uploaded by Sandi Jones, 1/29/2016 10:50 am)
- **CMap 1 MSBiostatistics_Semesters_29Nov15.xlsx** (uploaded by Sandi Jones, 1/29/2016 10:50 am)
- **Copy of RoadmapMS_Biostatistics.xlsx** (uploaded by Sandi Jones, 1/29/2016 10:51 am)