DOCUMENTS OF THE GENERAL FACULTY
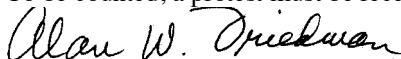
REQUEST TO CHANGE THE APPLIED STATISTICAL MODELING CERTIFICATE IN THE COLLEGE OF NATURAL SCIENCES CHAPTER IN THE *UNDERGRADUATE CATALOG 2018-2020*

Dean Linda A. Hicke in the College of Natural Sciences has filed with the Secretary of the Faculty Council the following proposal to change the Applied Statistical Modeling certificate in the College of Natural Sciences chapter in the *Undergraduate Catalog, 2018-2020*. On October 21, 2016, Interim Chair Peter Mueller approved the proposal and on May 2, 2017, the faculty in the Department of Statistics and Data Sciences approved it. On September 20, 2017, the Course and Curriculum Committee and Associate Dean David Vanden Bout, on behalf of the Dean Hicke, approved the proposal. The Secretary has classified this proposal as legislation of exclusive interest to one college or school.

The Committee on Undergraduate Degree Program Review recommended approval of the proposal on September 14, 2017, and forwarded it to the Office of the General Faculty. The Faculty Council has the authority to approve this legislation on behalf of the General Faculty. The authority to grant final approval on this legislation resides with the Provost on behalf of the President.

If no objection is filed with the Office of the General Faculty by the date specified below, the legislation will be held to have been approved by the Faculty Council. If an objection is filed within the prescribed period, the legislation will be presented to the Faculty Council at its next meeting. The objection, with reasons, must be signed by a member of the Faculty Council.

To be counted, a protest must be received in the Office of the General Faculty by January 15, 2018.

Alan W. Friedman

Alan W. Friedman, Secretary of the General Faculty and Faculty Council
The University of Texas at Austin
Arthur J. Thaman and Wilhelmina Doré Thaman Professor of English and Comparative Literature

REQUEST TO CHANGE THE APPLIED STATISTICAL MODELING CERTIFICATE IN THE COLLEGE OF NATURAL SCIENCES CHAPTER IN THE *UNDERGRADUATE CATALOG 2018-2020*

Type of Proposal   ☐ New Certificate Program
☒ Change an Existing Certificate Program
☐ Delete a Program

Note: If the certificate program proposed for addition or change includes a requirement of 21 to 24 semester credit hours, an additional form is required for THECB approval/notation.

Proposed classification: ☒ Exclusive   ☐ General   ☐ Major

1. **IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE MUST CONSULT <u>LINDA DICKENS, DIRECTOR OF ACCREDITATION AND ASSESSMENT</u>, TO DETERMINE IF SACSCOC APPROVAL IS REQUIRED.**
    - Is this a new transcript-recognized certificate program?   Yes ☐ No ☒
    - Is this a request to delete an existing transcript-recognized certificate program?   Yes ☐ No ☒
    - Does the certificate offer courses that will be taught off campus?   Yes ☐ No ☒
    - Will courses in this program be delivered electronically?   Yes ☐ No ☒
    - Will courses be developed specifically for the new certificate?   Yes ☒ No ☐

    SDS 358, Topic 1: Applied Regression Analysis. Through software application, discussion, and guided instruction, students will first learn simple linear regression – what data is appropriate, how to run the analysis, and how to interpret the output. Then, students will move on to multiple regression with combinations of predictor variables, both continuous and categorical. There will be a discussion/application of ANOVA, prior to preceding on to logistic regression: the prediction of discrete events. Because of the hands-on nature of the course, there will be opportunity to apply the skills learned in class to real data for a final project.

    Linda Neavel Dickens, October 24, 2016, email: If you have one course only that is developed just for this certificate, then we do not need to report it to SACSCOC and we do not need approval.

2. THIS PROPOSAL INVOLVES (Please check all that apply)

☐ Courses in other colleges	☐ Courses in proposer's college that are frequently taken by students in other colleges	☐ Flags
☐ Course in the core curriculum	☒ Change in course sequencing for an existing program	☒ Courses that have to be added to the inventory
☐ Change in admission requirements (external or internal)	☐ Requirements not explicit in the catalog language (e.g., lists of acceptable courses maintained by department office)	SDS 358, Topic 1, created for certificate, effective fall 2017

3. **SCOPE OF PROPOSED CHANGE**
    a. Does this proposal impact other colleges/schools?   Yes ☐ No ☒
        If yes, then how?
        Note: EE 361M and ECO 350K (Topic 4: Advanced Econometrics) were removed from the certificate. They were deleted by their colleges from the course inventory effective fall 2017 and fall 2016, respectively.
    b. Do you anticipate a net change in the number of students in your college?   Yes ☐ No ☒
        If yes, how many more (or fewer) students do you expect?
    c. Do you anticipate a net increase (or decrease) in the number of <u>students from outside</u> of your college taking <u>classes in your college</u>?   Yes ☐ No ☒
        If yes, please indicate the number of students and/or class seats involved.
    d. Do you anticipate a net increase (or decrease) in the number of <u>students from your college</u>

taking <u>courses in other colleges</u>?   Yes ☐ No ☒

If yes, please indicate the number of students and/or class seats involved.

If 3 a, b, c, or d was answered with yes, please answer the following questions. If the proposal has potential budgetary impacts for another college/school, such as requiring new sections or a non-negligible increase in the number of seats offered, at least one contact must be at the college-level.

How many students do you expect to be impacted?

Impacted schools must be contacted and their response(s) included:

    Person communicated with:

    Date of communication:

    Response:

4. **OFFICIAL CERTIFICATE NAME:** Undergraduate Certificate: Applied Statistical Modeling Certificate

5. **CIP CODE** (administrative unit awarding the certificate):

7. **STATEMENT OF OBJECTIVE**:

8. **NUMBER OF STUDENTS EXPECTED TO RECEIVE THE CERTIFICATE EACH SEMESTER:**

9. **NUMBER OF HOURS REQUIRED FOR COMPLETION (Note: If the number of required hours is 21 to 24, THECB form is required)**: Eighteen hours

10. **LIST FACULTY ON THE CERTIFICATE PROGRAM FACULTY COMMITTEE**.

Name of Faculty Member	College/Department	Title at UT Austin	Highest Degree and Awarding Institution

11. **ACADEMIC COURSE REQUIREMENTS**: Use this table to identify the courses that qualify for this certificate program.

Course Abbreviation and Number	Course Title	SCH
M 378K	Introduction to Mathematical Statistics # # M 362K.	3
SDS 332	Statistical Models for the Health and Behavioral Sciences # # SDS 302, 304, 306, 328M, or the equivalent.	3
SDS 358	Special Topics in Statistics # # Upper-division standing; additional prerequisites may vary with the topic.	3
SDS 358, Topic 1	Topic 1: Applied Regression Analysis # Upper-division standing; and credit for Statistics and Data Sciences 302, 304, 306, or 328M.	3
SDS 378	Introduction to Mathematical Statistics # # M 362K.	3

12. **OTHER CERTIFICATE REQUIREMENTS:**

13. **GIVE A DETAILED RATIONALE FOR CHANGE(S):**

This change is a restructure to the certificate sequence with three SDS courses added and no courses removed. The current sequence creates a bottleneck in 1b as the only regularly offered course is M 378K.

The alternate course in this track, SDS 323, is no longer being offered as the professor who taught this course has left the university. To mitigate this bottleneck and reduce the burden on students attempting to complete the certificate in a timely manner, 1b is being removed and its courses are shifting to the electives section. Additional SDS courses are added to sequence 2b and 3a. Three additional Math courses are added as prerequisite options. The course lost from requirement 1 is added to requirement 3. The statement requiring three hours upper-division is redundant because there are only upper-division choices on the lists.

SDS 358 (Topic 1: Applied Regression Analysis), will be available as an elective in the SDS Applied Statistical Modeling certificate, intended to expand on basic statistics knowledge into regression analysis. This course provides students with real-world data to examine real-world questions using various regression techniques. These skills will then be used in a final project on data of the student's choosing.

Certificate prerequisite change: The calculus choices were expanded to include M 408N, 408R, or 408S. Students need calculus exposure but any of these choices are appropriate.

A statement regarding M 378K and SDS 378 was added to 3a. The courses are in duplicate relationships with each other.

EE 361M and ECO 350K (Topic 4: Advanced Econometrics) were removed from the certificate. They were deleted by their colleges from the course inventory effective fall 2017 and fall 2016, respectively.

Added a statement that SDS 358, Topic 1, cannot count toward both requirement 2b and 3a.

14. **COLLEGE/SCHOOL APPROVAL PROCESS:**
    Approver: Peter Mueller, chair, ad interim   October 21, 2016; May 2, 2017
                 Department of Statistics and Data Sciences
    Approver: Course and Curriculum Committee   November 3, 2016; September 20, 2017
    Approver: David Vanden Bout   September 20, 2017

PROPOSED NEW CATALOGTEXT:
Applied Statistical Modeling Certificate

The certificate in Applied Statistical Modeling equips undergraduate students with the tools necessary to understand how to apply statistics to their primary field of study. This certificate program is designed to complement diverse degree programs and to appeal to students across the University in engineering, science, economics, mathematics, and many other disciplines. Certificate students will complete [a two-course sequence] one course in the mathematical foundations of statistics, a two-course sequence in applied statistics, [data mining, and machine learning,] and [six] nine additional hours in statistics, machine learning, econometrics, and other relevant courses from the approved list below.

Admission to the certificate is by application only. Students may download an application from the Department of Statistics and Data Sciences webpage. Students seeking the certificate must also complete the prerequisite course Mathematics 408C, [or] 408L, 408N, 408R, or 408S with a grade of at least *C*-.

The certificate consists of eighteen [18] hours. Students must receive a grade of at least *C* in each course applied toward the certificate and have a cumulative grade point average of at least 3.0 in the courses presented to fulfill the certificate. Courses that appear in multiple approved course lists may be used to satisfy only one requirement. Students must contact the Department of Statistics and Data Sciences to apply for the certificate in the semester in which they are completing the requirements and graduating.
  1. [Sequence in the m] Mathematical foundation of statistics, choose one of the following:
      a. [Choose one of the following:]Electrical Engineering 351K, Mathematics 362K, or Statistics and Data Sciences 321
      [b. Choose one of the following: Mathematics 378K, Statistics and Data Sciences 323, or 378]
  2. Sequence in applied statistics[, data mining, and machine learning]:

     a.   Choose one of the following: Economics 329, Educational Psychology 371, Mathematics 358K, Psychology 418, Sociology 317L, Statistics 309, Statistics and Data Sciences 302, 304, 306, or 328M

     b.   Choose one of the following: Economics 341K, Mathematics 349R, Statistics 371G, 371H, 375, Statistics and Data Sciences 325H, [or] 332, 352, or 358 (*Topic 1: Applied Regression Analysis*)

3.   [Six] Nine hours of additional coursework chosen freely from the following lists. [Of the six hours, a minimum of three hours must be upper-division.]

    Students are encouraged to select courses within their own majors or colleges as appropriate. The Statistics and Data Sciences courses listed in requirement 3a are available to students in all majors.

     a.   Courses in the College of Natural Sciences: Computer Science 343, Mathematics 339J, 349P, [and] 362M, and 378K*, Public Health 354, Statistics and Data Sciences 323, 348, 353, 358, 374E, 375, 378*, and 379R

        Statistics and Data Sciences 358 (*Topic 1: Applied Regression Analysis*) may not count toward both requirement 2b and requirement 3a

        * Note, only one of the following may be counted: Mathematics 378K and Statistics and Data Sciences 378

     b.   Courses in the McCombs School of Business: Statistics 372 (Topic 5: *Financial and Econometric Time Series Modeling*)

     c.   Courses in the Moody College of Communication: Advertising 344K, and Communication Studies 348

     d.   Courses in the College of Education: Health Education 343 and 373, and Kinesiology 376

     e.   Courses in the Cockrell School of Engineering: [Electrical Engineering 361M and] Petroleum and Geosystems Engineering 378

     f.   Courses in the Jackson School of Geosciences: Geological Sciences 325K and 365N

     g.   Courses in the College of Liberal Arts: Economics [350K (Topic 4: *Advanced Econometrics*) and] 354K[,]and Psychology 325K