To be adopted:

Proposed changes to the Bachelor of Science and Bachelor of Arts in Statistics including the Statistical Computing and Quantitative Management Options.

**PRESENT:**

Major

The Department of Statistics is concerned with teaching, research, and statistical consulting. The courses offered present a comprehensive spectrum of statistical and probability theory, in so far as such theory is necessary for the understanding and analysis of observational data. The applications of the theory delineated in the courses may be made in any field of experience. Laboratory classes in which examples related to the student’s actual field of interest are worked out, play an essential part. The department offers both B.A. and B.S. degrees in Statistics as well as a B.S. in Statistics with options in Statistical Computing and Quantitative Management; the M.S. degree in Statistics; and the Ph.D. degree in Applied Statistics.

The courses STAT 040, STAT 048, STAT 100A, STAT 100B, STAT 104/BUS 104, STAT 110, STAT 130, STAT 140, STAT 146, and STAT 155 are intended for students of other departments who wish a knowledge of statistical techniques. Some of them may be taken as electives by statistics majors. The objective of these courses is to acquaint the student with the elements of statistics with only the necessary amount of mathematical training.

STAT 147 and STAT 157 are computer-oriented courses intended for students who would like to learn about computer programming in the most important languages and who would like to learn about statistical computing.

**PROPOSED:**

[no change]

The courses STAT 004, STAT 008, STAT 010, STAT 011, STAT 104/BUS 104, STAT 110, STAT 130, STAT 140, STAT 146, and STAT 155 are intended for students of other departments who wish a knowledge of statistical techniques. Some of them may be taken as electives by statistics majors. The objective of these courses is to acquaint the student with the elements of statistics with only the necessary amount of mathematical training.

The courses STAT 107, STAT 157 and STAT 167 are computer-oriented courses intended for students who would like to learn about computer programming in the most important languages and who would like to learn about statistical computing.
Transfer Students
Students transferring to the Statistics major must complete courses comparable to the following one-year sequence before they transfer:

1. First-year calculus, equivalent to MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC, each course completed with a grade of “B-” or better.

Computing Laboratories
The department has two large undergraduate Windows-based teaching laboratories. These laboratories provide users access to a wide variety of statistical software packages including SAS, R, Minitab, and SPSS, and other popular software packages including Mathematica, Adobe Acrobat, and Microsoft Office. The department also houses the Garber Research Computing Laboratory, which is a combination of a UNIX/LINUX-based system with multiple workstations and several Windows-based machines.

Statistical Consulting Center
The Statistical Consulting Collaboratory provides a broad range of analytical and statistical support services, including design of experiments, statistical inference, hypothesis testing, and data modeling for the campus community, and promotes cooperative research between statisticians and other investigators in all fields of the application of statistics. The Collaboratory is staffed by:

Yehua Li, Ph.D., Faculty Director and Karen Huaying Xu, Ph.D., Associate Director and rotating graduate students.

Change of Major Criteria
All courses taken to fulfill major requirements must be completed with grades of “C-” or better after repeats.

Freshman (0-44.9 units earned)
Completion of the following with grade of “C-” or better and must be in good academic standing. (2.0 quarter and cumulative GPA)
Sophomores (45-89.9 earned units)
Completion of the following with grade of “C-” or better and must be in good academic standing.
(2.0 quarter and cumulative GPA)
- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB |

Juniors (90-134.9 earned units)
Completion of the following with grade of “C-” or better and must be in good academic standing.
(2.0 quarter and cumulative GPA)
- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC |
- 4 (four) additional units of college-level Mathematics or Statistics (STAT 100A recommended) |

Seniors (135 or more earned units)
Completion of the following with grade of “C-” or better and must be in good academic standing.
(2.0 quarter and cumulative GPA)
- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC |
- 12 (twelve) additional units of college level Mathematics or Statistics (MATH 031, STAT 100A and STAT 147 recommended) |

Transfer Selection Criteria
Applicants to majors in the College of Natural and Agricultural Sciences are selected on the basis of academic preparation, as assessed by their GPA and the strength of preparation for the intended major. A GPA of at least 2.70 is required. (This is |
In addition, applicants will need to complete college courses comparable to at least two of the following UCR year-long sequences in order to meet selection criteria for this major. Courses must be completed with “C” grades or better:

- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, and MATH 009C or MATH 09HC (mandatory). A grade of “B-” or better is required in this series.

And at least one sequence from:
1. BIOL 005A, BIOL 05LA or BIOL 020 and BIOL 005B (and BIOL 005C, if articulated)
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, and CHEM 01LC
3. Organic chemistry (one-year lower-division), each course completed with a grade of “B” or better
4. PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB PHYS 002C, and PHYS 02LC
5. PHYS 040A, PHYS 040B, and PHYS 040C
6. MATH 010A and MATH 010B, or one course in linear algebra.

Courses must be completed with a letter grade, with no grade lower than a “C.” Students should visit assist.org for updated and comprehensive major preparation requirements.

University Requirements
See Undergraduate Studies section.

College Requirements
See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college’s breadth requirements. Consult with a department advisor for course planning.
Major Requirements
The department offers both a B.A. and a B.S. degree in Statistics as well as a B.S. in Statistics with options in Statistical Computing and Quantitative Management.

The major requirements for the B.A. and the B.S. degrees in Statistics are as follows:

For the Bachelor of Arts

1. Core requirements (24–25 units)
   a) CS 010, MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC, MATH 010A
   b) MATH 031

2. Upper-division requirements
   a) Thirty-six (36) units of upper-division course work to include thirty-two units in (1) and four units in (2)
      (1) STAT 147, STAT 157, STAT 160A, STAT 160B, STAT 160C, STAT 170A, STAT 170B, STAT 171
      (2) Four (4) units of STAT 183 taken during senior year

Note: An introductory Statistics class such as STAT 048, or STAT 100A is strongly recommended.

For the Bachelor of Science

1. Core requirements (24–25 units)
   a) CS 010, MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC, MATH 010A
   b) MATH 031

2. Upper-division requirements (36–37 Units)
   a) Thirty-two (32) units of upper-division course work to include twenty-eight units in (1) and four units in (2)
      (1) STAT 107, STAT 160A, STAT 160B, STAT 160C, STAT 169, STAT 170, STAT 171
      (2) Four (4) units of STAT 183 taken during senior year
   b) Four (4) units of additional coursework chosen from STAT 110, BUS 127/STAT 127, STAT 130, STAT 140, STAT 146, STAT 157, STAT 161, STAT 167 or from related fields with the approval of the major advisor.

For the Bachelor of Arts

1. Core requirements (29–30 units)
   a) STAT 010, CS 010A, MATH 007A or MATH 009A, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC, MATH 010A
   b) MATH 031

2. Upper-division requirements (52-53 Units)
   a) Thirty-two (32) units of upper-division course work to include twenty-eight units in (1) and four units in (2)
      (1) STAT 107, STAT 160A, STAT 160B, STAT 160C, STAT 169, STAT 170, STAT 171
      (2) Four (4) units of STAT 183 taken during senior year
   b) Four (4) units of additional coursework chosen from STAT 110, BUS 127/STAT 127, STAT 130, STAT 140, STAT 146, STAT 157, STAT 161, STAT 167 or from related fields with the approval of the major advisor.
(2) Four (4) units of STAT 183 taken during senior year
b) Sixteen (16) units of additional course work chosen from STAT 110, STAT 127/BUS 127, STAT 130, STAT 140, STAT 146, STAT 161, STAT 167 or from related fields with the approval of the major advisor.

Note: An introductory Statistics class such as STAT 048, or STAT 100A is strongly recommended.

Statistical Computing Option
The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 46 units in 2.b) above.

1. Lower-division requirements (8 units):
   CS 012, CS 014

2. Upper-division requirements (16 units)
   a) STAT 167
   b) Twelve (12) units of coursework selected from
      (1) CS 141, CS 177
      (2) MATH 120, MATH 135A, MATH 135B

Quantitative Management Option
The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 46 units in 2.b) above.

1. Lower-division requirements (18 units)
   a) ECON 002, ECON 003 or ECON 03H
   b) BUS 010, BUS 020; BUS 020, BUS 021 for those who choose area (3) Accounting under below 2.b).

2. Upper-division requirements (16 units)
   a) BUS/STAT 104
   b) Three courses from one area:
      (1) Marketing: BUS 103 and two other courses from BUS 111, BUS 112, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119
      (2) Finance: BUS 106 and two other courses from BUS 138, BUS 139, BUS 140

Statistical Computing Option
The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 20 units in 2.b) above.

1. Lower-division requirements (8 units):
   CS 010B, CS 010C

2. Upper-division requirements (16 units)
   a) STAT 167
   b) Twelve (12) units of coursework selected from
      (1) CS 141, CS 177
      (2) MATH 120, MATH 135A, MATH 135B

Quantitative Management Option
The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 20 units in 2.b) above.

[no change]
(3) Accounting: BUS 108, BUS 165A, BUS 165B, BUS 168A, BUS 168B, BUS 169A
(4) Management: BUS 143, BUS 144, BUS 145, BUS 149, BUS 150
(5) Information Systems: BUS 101 and two other courses from BUS 171, BUS 173, BUS 174, BUS 175
(6) Operations & Supply Chain Management: BUS 122, BUS 123, BUS 124, BUS 125, BUS 126, BUS 128, BUS 130

**Justification:**

The proposed revisions are motivated by a comprehensive review of the undergraduate statistics courses and programs. The revisions are intended to better align the course numbering, sequencing, and prerequisites for required program courses. A majority of the revisions reflect the renumbering of several courses (CS 010 / 012 / 014 to CS 010A / 010B / 010C, STAT 040 to STAT 004, STAT 048 to STAT 008, STAT 100A to STAT 010, STAT 100B to STAT 011, STAT 147 to STAT 107, STAT 170A to STAT 170, and STAT 170B to STAT 169).

The Bachelor of Arts and Bachelor of Science programs have been updated to include STAT 010 (previously STAT 100A) as a core requirement in order to resolve the issue of it being a ‘hidden’ requirement of other STAT courses. STAT 157 - Statistical Computing with SAS has also been removed as a requirement due to new course descriptions for STAT 107 (previously STAT 147) and STAT 157 which streamline the content of these two courses while simultaneously creating two distinct computing courses. The redesigned STAT 107 (previously STAT 147) will now cover the necessary statistical computing education required for subsequent statistics courses and industry use. To accommodate removing STAT 157 as a required course, the number of required additional upper division coursework has been increased by 4 units and STAT 157 has been added to the list of courses to choose from. See 2(b). The note recommending students to take an introductory statistics course like STAT 048 or STAT 100A is being removed since STAT 010 will be a core requirement. A range of units was added to the Upper-Division requirements for the BA (36-37 units) and BS (52-53 units) for consistency purposes.

The changes to the Bachelor of Science with Statistical Computing Option and the Bachelor of Science with Quantitative Management Option reflect the changes to the Bachelor of Science program. Namely, the statement identifying the number of units required in 2(b) for the Bachelor of Science.

The change of major criteria for Juniors has been updated to require STAT 010 and STAT 011 since these courses are being added as a requirement for the major. The major criteria for Seniors has been updated to remove STAT 157 (just as it was removed from the major requirements) and require STAT 160A and STAT 160B. The STAT 160ABC sequence is taken by students in their junior year with STAT 160B being prerequisites for the required STAT courses that students take in their Senior year (such as STAT 169 and STAT 170). Requiring these courses for seniors changing their major to statistics will ensure they are kept on schedule to graduate in four years.

**Approvals:**

Approved by the faculty of the Department of Statistics: October 30, 2020
Approved by the Executive Committee of the College of Natural