EXECUTIVE COMMITTEE
COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES

REPORT TO THE RIVERSIDE DIVISION
MAY 19, 2015

To be adopted:

Proposed Changes to Mathematics

PRESENT:

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 a baseline GPA for consideration and not a guarantee of admission.) 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 009A, MATH 009B, and MATH 009C (mandatory)
And at least one sequence from:
1. BIOL 005A/BIOL 05LA and BIOL 005B (and BIOL 005C, if articulated)
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, and CHEM 01LC
3. PHYS 002A, PHYS 021A, PHYS 002B, PHYS 021B PHYS 002C, and PHYS 021C
4. PHYS 040A, PHYS 040B, and PHYS 040C
5. MATH 010A, MATH 010B, and MATH 046

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

PROPOSED:

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 a baseline GPA for consideration and not a guarantee of admission.) 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 009A, MATH 009B, and MATH 009C (mandatory)
And at least one sequence from:
1. BIOL 005A/BIOL 05LA and BIOL 005B (and BIOL 005C, if articulated)
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, and CHEM 01LC
3. PHYS 002A, PHYS 021A, PHYS 002B, PHYS 021B PHYS 002C, and PHYS 021C
4. PHYS 040A, PHYS 040B, and PHYS 040C
5. MATH 010A, MATH 010B, and MATH 046

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.

Major Requirements for the Bachelor of Arts and Bachelor of Science in Mathematics
To fulfill the Natural Sciences requirement, the Department of Mathematics requires the following:

1. One of the year sequences
   a) BIOL 002, BIOL 003, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C,
      PHYS 002A, PHYS 002B, PHYS 002C or PHYS 040A, PHYS 040B, PHYS 040C

2. Either one course in the physical sciences listed above if (a) above is completed or one course in the biological sciences if (b) or (c) above is completed

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

For the Bachelor of Arts
1. Lower-division requirements: MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 031, MATH 046
2. Four (4) units of either CS 010 or one upper-division course in Statistics
3. A minimum of 36 units of upper-division mathematics, excluding courses in the MATH 190–199 series

For the Bachelor of Science
Lower-division requirements for all programs are MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 031, MATH 046, CS 010 (CS 012 is recommended).

1. Pure Mathematics program (56 units)
   a) Thirty-six (36) units of upper-division mathematics to include at least 24 units from MATH 131, MATH 132, MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C, MATH 171, MATH 172
   b) At least three courses from (a) above must be from MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C

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

Major Requirements for the Bachelor of Arts and Bachelor of Science in Mathematics
To fulfill the Natural Sciences requirement, the Department of Mathematics requires the following:

1. One of the year sequences
   a) BIOL 002, BIOL 003, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C,
      PHYS 002A, PHYS 002B, PHYS 002C or PHYS 040A, PHYS 040B, PHYS 040C

2. Either one course in the physical sciences listed above if (a) above is completed or one course in the biological sciences if (b) or (c) above is completed

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

For the Bachelor of Arts
1. Lower-division requirements: MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 031, MATH 046
2. Four (4) units of either CS 010 or one upper-division course in Statistics
3. A minimum of 36 units of upper-division mathematics, excluding courses in the MATH 190–199 series

For the Bachelor of Science
Lower-division requirements for all programs are MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 031, MATH 046, CS 010 (CS 012 is recommended).

1. Pure Mathematics program (56 units)
   a) Thirty-six (36) units of upper-division mathematics to include at least 24 units from MATH 131, MATH 132, MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C, MATH 171, MATH 172
   b) At least three courses from (a) above must be from MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C
c) Courses in the MATH 190–199 series are excluded
d) Twenty (20) additional units of upper-division mathematics, upper-division computer science, or other related courses approved by the undergraduate advisor (For students who wish to pursue graduate work, courses in complex variables, differential equations, and probability may be particularly useful.)

2. Applied Mathematics programs

MATH 131, MATH 135A and MATH 135B, or MATH 149A and MATH 149B, MATH 146A, MATH 146B, MATH 146C and the courses in one of the following options:

   a) General Applied Mathematics option
      (1) MATH 150 or MATH 151A
      (2) MATH 168
      (3) Students will select 16 units from
          MATH 120, MATH 121, MATH 126, MATH 141, MATH 147, MATH 148,
          MATH 149A, MATH 149B, MATH 149C, MATH 150B, MATH 151B, MATH 165A, MATH 165B

b) Biology option

   (1) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
   (2) MATH 149A
   (3) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C
   (4) BIOL 102, BIOL 105, BIOL 108
   (5) Four (4) additional units of upper-division biology

c) Chemistry option

   (1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   (2) Either PHYS 040A, PHYS 040B, PHYS 040C (preferred), or PHYS 002A, PHYS 002B, PHYS 002C
   (3) Four courses from MATH 120, MATH 135A, MATH 135B, MATH 149A, MATH 149B, MATH 149C, MATH 165A, MATH 165B

2. Applied Mathematics programs

MATH 131, MATH 135A and MATH 135B, or MATH 149A and MATH 149B, MATH 146A, MATH 146B, MATH 146C and the courses in one of the following options:

   a) General Applied Mathematics option
      (1) MATH 150 or MATH 151A
      (2) MATH 168
      (3) Students will select 16 units from
          MATH 120, MATH 121, MATH 126, MATH 141, MATH 147, MATH 148,
          MATH 149A, MATH 149B, MATH 149C, MATH 150B, MATH 151B, MATH 165A, MATH 165B

b) Biology option

   (1) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
   (2) MATH 149A
   (3) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C
   (4) BIOL 102, BIOL 105, BIOL 108
   (5) Four (4) additional units of upper-division biology

c) Chemistry option

   (1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   (2) Either PHYS 040A, PHYS 040B, PHYS 040C (preferred), or PHYS 002A, PHYS 002B, PHYS 002C
   (3) Four courses from MATH 120, MATH 135A, MATH 135B, MATH 149A, MATH 149B, MATH 149C, MATH 165A, MATH 165B
d) Economics option

(1) MATH 120, MATH 121, MATH 149A, MATH 149B, MATH 149C
(2) Five upper-division economics courses (at least 20 units) to consist of ECON 102A and four courses to be chosen from ECON 102B, ECON 103A, ECON 103B, ECON 107, ECON 108, ECON 110, ECON 111, ECON 134/BUS 106, ECON 135, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 143C/ENSC 143C, ECON 156, ECON 206

(1) MATH 120, MATH 121, MATH 149A, MATH 149B, MATH 149C
(2) Five upper-division economics courses (at least 20 units) to consist of ECON 102A and four courses to be chosen from ECON 102B, ECON 103A, ECON 103B, ECON 107, ECON 108, ECON 110, ECON 111, ECON 134/BUS 106, ECON 135, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 143C/ENSC 143C, ECON 156, ECON 206
d) Economics option

e) Environmental Sciences option

(1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 010A, CHEM 010B, CHEM 010C
(2) ECON 006/ENSC 006
(3) GEO 001 is recommended
(4) MATH 149A
(5) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C, CS 177, STAT 155
(6) ENSC 100/SWSC 100, ENSC 101, ENSC 102
(7) Eight (8) additional units of upper-division environmental sciences

(1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 010A, CHEM 010B, CHEM 010C
(2) ECON 006/ENSC 006
(3) GEO 001 is recommended
(4) MATH 149A
(5) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C, CS 177, STAT 155
(6) ENSC 100/SWSC 100, ENSC 101, ENSC 102
(7) Eight (8) additional units of upper-division environmental sciences
e) Environmental Sciences option

f) Physics option

(1) MATH 135A, MATH 165A, MATH 165B
(2) Either MATH 120 or MATH 171
(3) PHYS 130A, PHYS 130B
(4) Either PHYS 135A, PHYS 135B, PHYS 136 or PHYS 156A, PHYS 156B

(1) MATH 135A, MATH 165A, MATH 165B
(2) Either MATH 120 or MATH 171
(3) PHYS 130A, PHYS 130B
(4) Either PHYS 135A, PHYS 135B, PHYS 136 or PHYS 156A, PHYS 156B

f) Physics option

g) Statistics option

(1) MATH 120, MATH 149A, MATH 149B, MATH 149C

(1) MATH 120, MATH 149A, MATH 149B, MATH 149C
g) Statistics option
3. **Computational Mathematics** program

a) MATH 011/CS 011, MATH 131, MATH 120, MATH 132, MATH 135A, MATH 135B
b) CS 012, CS 014, CS 141, CS 150
c) One additional CS course to be chosen from the list of approved technical elective courses.
d) Twenty-four (24) units of technical electives to be chosen from
   (1) CS 111, MATH 121, MATH 126, MATH 146A, MATH 146B, MATH 146C, MATH 149A, MATH 149B, MATH 149C, MATH 171
   (2) CS 130, CS 133, CS 166, CS 170, CS 177

**Major Requirements for the Bachelor of Science in Mathematics for Secondary School Teachers**

1. Lower-division Mathematics requirements (24 units) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 031, MATH 046

2. Upper-division Mathematics requirements (36 units)
a) MATH 131, MATH 133, MATH 140, MATH 144, MATH 153
b. MATH 150A or MATH 151A
c. Three courses from: MATH 132, MATH 136, MATH 137, MATH 138A, MATH 145A, MATH 145B, MATH 149A, MATH 149B, MATH 149C, MATH 150B, MATH 151B, MATH 151C, MATH 171, MATH 172

3. Additional Mathematics and related disciplines requirements (12 units)
a) CS 010
b) CS 011/MATH 011
c) STAT 155

4. Natural Sciences (16-20 units)
a) BIOL 002 or BIOL 003 or BIOL 005A and BIOL 051A
b) CHEM 001A and CHEM 011A or CHEM 001HA and CHEM 1HLA
c) PHYS 002A or PHYS 040A
d) CHEM 001B and CHEM 011B or CHEM 001HB and CHEM 1HLB or PHYS 002B or PHYS 040B or an additional laboratory

5. Social Sciences (16 units)
   a) One course in ECON or POSC
   b) One course in ANTH
   c) One course in PSYC
   d) One course in SOC

6. Mathematics Education and Education requirements (18 or 19 units): EDUC 104/MATH 104, EDUC 003 or EDUC 004 or EDUC 100B or equivalent, EDUC 109, EDUC 110, EDUC 139

7. Recommended Courses LING 020 or LING 021, EDUC 116, EDUC 174, EDUC 177A
**Justification:**
Physics is changing their PHYS002ABC series. The PHYS002ABC series will now be a virtually calculus-free version of an Introduction to Physics. However, the Physics Department also has a calculus-based Introduction to Physics, namely the PHYS040ABC series.

Our catalog description for many majors states that PHYS002ABC or PHYS040ABC may be taken. The Mathematics faculty feel it would be inappropriate for a Math Department to allow a calculus-free option of Introduction to Physics for their own majors. Therefore, we would propose to remove the PHYS002ABC series option throughout our requirements and replace it with the PHYS040ABC series.

**Approvals:**
Approved by the faculty of the Department of Mathematics: October 20, 2014
Approved by the Executive Committee of the College of Natural and Agricultural Sciences: February 17, 2015
Reviewed by the Committee on Undergraduate Admissions: April 27, 2015
Approved by the Committee on Educational Policy: April 27, 2015