

**College Of Science**  
Bachelor of Science: Mathematics Major  
**Applied Computational Mathematics Option**  
Effective for Students Graduating in Calendar Year 2017

**I. Curriculum for Liberal Education** (30 credits): All courses used for the Curriculum for Liberal Education must be on the approved Curriculum for Liberal Education list. Each of Area 2 and Area 3 require 6 hours. Area 4 requires a single 6 hour sequence in Biology, Chemistry, Geosciences Environmental Science or Physics. Mathematics majors must take either Path 1: Math 1205-1206 or PATH 2: Math 1225-1226 or the equivalent to satisfy the Area 5 requirement. The Area 6 requirement must be met with one 3-credit course, not three 1-credit courses.

|   |  |       |       |
|---|--|-------|-------|
| Area 1: Writing and Discourse (6 credits)   |  | _____ | 3 ( ) |
|   |  | _____ | 3 ( ) |
| Area 2: Ideas, Cultural Traditions and Values (6 credits)                                     |  | _____ | 3 ( ) |
|   |  | _____ | 3 ( ) |
| Area 3: Society and Human Behavior (6 credits)  |  | _____ | 3 ( ) |
|   |  | _____ | 3 ( ) |
| Area 4: Scientific Reasoning and Discovery (6 credits)  |  | _____ | 3 ( ) |
|   |  | _____ | 3 ( ) |
| Area 5: Quantitative and Symbolic Reasoning (met by major)                                    |  |       |       |
| Area 6: Creativity and Aesthetic Experience (3 credits)                                       |  | _____ | 3 ( ) |
| Area 7: Critical Issues in a Global Context (3 credits)                                       |  | _____ | 3 ( ) |
| Foreign languages: The equivalent of three years of one foreign language in secondary school. |  | _____ | 3 ( ) |
|   |  | _____ | 3 ( ) |

NOTE: Students who completed two years of a single foreign language in high school are strongly urged to complete the second semester (1106) of the foreign language very early in their program of study. Students who will be taking first and second semesters (1105-1106) of a foreign language are encouraged to schedule it in their freshman or sophomore years.

NOTE: Students who completed fewer than two years of a single foreign language in high school must complete six semester hours of one foreign language at the college level and these six credits do not count toward the 120 hours required to graduate in the College of Science.

**II. Required Mathematics Courses** (49 Credits)

**A. Calculus and Vector Geometry**

|                                  |       |  |       |
|----------------------------------|-------|--|-------|
| PATH 1:                          | OR    | PATH 2:                                    |       |
| MATH 1205 Calculus               | 3 ( ) | MATH 1225 Calculus of a Single Variable I  | 4 ( ) |
| MATH 1206 Calculus               | 3 ( ) | MATH 1226 Calculus of a Single Variable II | 4 ( ) |
| MATH 1224 Vector Geometry        | 2 ( ) | MATH 2204 Intro to Multivariable Calculus  | 3 ( ) |
| MATH 2224 Multivariable Calculus | 3 ( ) |  |       |

**B. Linear Algebra, ODE's**

|  |       |
|--|-------|
| MATH 1114 Elementary Linear Algebra        | 2 ( ) |
| MATH 2214 Intro. to Differential Equations | 3 ( ) |
| MATH 3144 Linear Algebra I                 | 3 ( ) |

**C. Proofs, Advanced Calculus**

|                                      |       |
|--------------------------------------|-------|
| MATH 3034 Intro. to Proofs           | 3 ( ) |
| MATH 3214 Calc. of Several Variables | 3 ( ) |
| MATH 3224 Advanced Calculus          | 3 ( ) |

**D. Computational Mathematics**

|  |       |
|--|-------|
| MATH 4445 Intro. to Numerical Analysis   | 3 ( ) |
| MATH 4446 Intro. to Numerical Analysis   | 3 ( ) |
| MATH 4414 Issues in Scientific Computing | 3 ( ) |

**E. Fourier Series and PDE's**

MATH 4425 Fourier Series and PDEs      3 ( )  
MATH 4426 Fourier Series and PDEs      3 ( )

**F. Mathematics Electives<sup>1</sup>**

\_\_\_\_\_ 3 ( )  
\_\_\_\_\_ 3 ( )

**III. Applied Areas (15 credits)**

**A. Computer Programming: One of the following:**

MATH 3054 Programming for Mathematical Problem Solving,      CS 1044 Introduction to Programming in C,  
CS 1054 Introduction to Programming in Java, or      CS 1114 Introduction to Software Design

\_\_\_\_\_ 3 ( )

**B. Application Area (12 credits) (Must be approved by ACM Faculty Committee)**

\_\_\_\_\_ 3 ( )      \_\_\_\_\_ 3 ( )  
\_\_\_\_\_ 3 ( )      \_\_\_\_\_ 3 ( )

**IV. Free Electives (sufficient to achieve the 120 credit graduation requirement)**

|               |               |               |
|---------------|---------------|---------------|
| _____ ( ) ( ) | _____ ( ) ( ) | _____ ( ) ( ) |
| _____ ( ) ( ) | _____ ( ) ( ) | _____ ( ) ( ) |
| _____ ( ) ( ) | _____ ( ) ( ) | _____ ( ) ( ) |
| _____ ( ) ( ) | _____ ( ) ( ) | _____ ( ) ( ) |

**V. Outcomes Assessment:** Each student is required to participate in the department's Outcomes Assessment procedures as determined by each year Undergraduate Program Committee and approved by the Head.

**VI. Satisfactory progress toward the B.S. in Mathematics:** Upon having attempted 36 semester credits, the student must have completed 12 credits of the Curriculum for Liberal Education. Upon having attempted 72 credits (including transfer, advanced placement, advanced standing, credit by examination and course withdrawal), the student must have completed 24 credits of the Curriculum for Liberal Education. In addition, satisfactory progress toward the B.S. in mathematics requires that:

1. Within the previous two semesters, the student must pass at least one mathematics course that is used in the in-major GPA calculation.
2. Upon having attempted 45 semester credits, students must have an in-major grade-point average of 2.2 or above.
3. Path 1: Upon having attempted 72 semester credits (including transfer, advanced placement, advanced standing, credit by examination, course withdrawal), students must have completed the following courses with grades of C- or better: Math 1205, 1206, 1224, 2224, 1114, 2214, and 303 and not have taken any of these courses more than twice, including attempts ending in course withdrawal.  
Path 2: Upon having attempted 72 semester credits (including transfer, advanced placement, advanced standing, credit by examination, course withdrawal), students must have completed the following courses with grades of C- or better: Math 1225, 1226, 1114 or 2114, 2204, 2214, and 303 and not have taken any of these courses more than twice, including attempts ending in course withdrawal.
4. ACM option students must submit an Application Area Course Plan upon having attempted 45 hours (including transfer, advanced placement and pass/fail).

**VII. Minimum hours required for graduation:** 120 credits

**VIII. Minimum GPA required for graduation:** Students are required to have a 2.00 GPA and a 2.00 in-major GPA for graduation. All mathematics courses count toward the in-major GPA for this option except MATH 1014, 1015, 1016, 1025, 1026, 2015, 2016, 2024 and any undergraduate mathematics course with second digit a 5 or a 6, i.e., MATH x5xx or MATH x6xx.

**Note:** Please consult the course catalogue for prerequisite requirements.

<sup>1</sup> The six hours of math electives must be chosen from Mathematics courses numbered between 4024 and 4454, with the following exceptions: (a) MATH 3124 can be used to satisfy three of the six hours required. (b) No more than 3 hours from MATH 4044, 4334, 4344 can be used to satisfy the six hour requirement.