DEPARTMENT OF MATHEMATICS

Chair and Coordinator: Dr. Thomas L. Fitzkee
Faculty: Fangjun Arroyo, K. Daniel Brauss, Minerva Brauss, Julian Buck, Renee Dowdy, Gregory Dungan, Thomas Fitzkee, Johanna Gibson, Kevin LoPresto, Kathy McCoy, Will McGuffey, Sharon O'Kelley, Nicole Panza, J. Lee Phillips, George Schnibben, Thomas Schnibben, Daniel Scofield, Damon Scott, Sophia Waymyers

MISSION STATEMENT

The principal purpose of the Department of Mathematics at Francis Marion University is to offer all University students a varied and well-balanced program of undergraduate education in mathematics. In the liberal arts tradition, the courses in the program teach students to think logically, to analyze problems and solve them appropriately, and to communicate their ideas clearly.

The department provides a broad range of entry-level courses in order to meet the needs of students with widely varying mathematical backgrounds and to provide them with skills appropriate for their selected majors. The mid-level and upper-level curriculum provided by the department leads to baccalaureate degrees in two distinct but overlapping areas: mathematical sciences and teacher licensure in mathematics. These courses prepare students for careers in education, business or industry, or for further study at the graduate level. The department also offers graduate courses in support of the post-baccalaureate program in teacher relicensure.

To maintain the vitality of the department and enhance the University's teaching mission, members of the department undertake new course development, conduct research, or pursue other avenues of faculty development. The department serves the general public by hosting an annual high-school mathematics competition and by actively participating in workshops, seminars, science fairs, and other programs that support the region's general education and development.

MAJOR

A major in mathematics requires the following:
(Students must select one of the following two options.)

1. Mathematical Sciences Option
   a) Mathematics 201, 202, 203, 304, 306, and 499
   b) Mathematics 311 (Double majors may substitute Mathematics 230 for Mathematics 311)
   c) Mathematics 405 or 407 or 411
   d) Three mathematics electives above the 199 level - at least one of these at the 400 level and no more than one at the 200 level
   e) Choice of Mathematics 213 or 226

2. Teacher Licensure Option
   The Francis Marion University School of Education prepares caring and competent teachers for the 21st century. The Department of Mathematics provides the major knowledge base for students seeking licensure to teach mathematics in the state of South Carolina. The department supports and encourages the conceptual framework of the School of Education.

General Education	B.S.	B.A.
Communications	9-10 hours	21-22 hours
English 101 (or English 101E/L)	3 or 4	3 or 4
English 102	3	3
Speech Communication 101	3	3
Foreign Language	0	12
Social Science	9 hours	9 hours
a. Political Science 101 or 103	3	3
b. Anthropology, Economics, Geography, or Sociology	3	6
c. Anthropology, Economics, Geography, Political Science, Sociology,		

or Honors 250-259	3	0
Humanities	12 hours	12 hours
a. Literature (any language)	3	3
b. History	3	3
c. Art 101, Music 101, or Theatre 101	3	3
d. Math 315	3	3
Mathematics (a minimum of 6 hours: Mathematics 111 and higher; B.A. degree allows Philosophy and Religious Studies 203 to be substituted for one of the math courses.)	-	-
Natural Sciences		
(Laboratories are required with courses)	12 hours	8 hours
a. Biology	4	4
b. Chemistry, Physics, or Physical Science*	4	4
c. Astronomy, Biology, Chemistry, Physics, Physical Science*, Psychology 206/216, or Honors 280-289	4	0

(To satisfy the Natural Sciences Requirement, students must take at least one course from a, at least one course from b, and for the B.S. degree, at least one course from c above.)

*Credit toward graduation may not be earned in both Physical Science 101-102 and any chemistry or any physics course.

Pre-Professional Education	7 hours	7 hours
Education 190, 191	4	4
Education 190 and Education 191 are corequisites		
Education 305	3	3
Professional Education	15 hours	15 hours
Education 310 or Computer Science 190 or Math 213 or higher	3	3
Education 311	3	3
Education 313	1	1
Education 420	3	3
Education 393 and 436 taken concurrently	5	5
Student Teaching Block**	15 hours	15 hours
Education 487	3	3
Education 490	12	12
**Education 487 and 490 to be taken concurrently		
Supporting Courses	6 hours	6 hours
Education 322	3	3
Education 411	3	3
Major or collateral courses	40-70	40-70
(See specific courses below)		
Mathematics Major Requirements		
Mathematics 201		3
Mathematics 202		3
Mathematics 203		3
Mathematics 230		3
Mathematics 304		3
Mathematics 306		3
Mathematics 311		3
Mathematics 312		3
Mathematics 315		_
Mathematics 345		3
Mathematics 405		3
Mathematics 499		3
Mathematics 213 or Computer Science 190 or 226		_
Electives (if needed)		

Minor/collateral requirements for Mathematical Sciences Option (two options)
   a) two 12-hour collaterals approved by the faculty adviser

   b) an 18-hour minor approved by the faculty adviser

Collateral requirement for Teacher Licensure option
   a) one 12-hour collateral approved by the faculty adviser

It is strongly recommended that all mathematics majors take Physics 201 and 202.

The minimum number of semester hours required in major courses for a major in mathematics is 33 for the Mathematical Sciences Option and 36 for the Teacher Licensure Option. The minimum number of semester hours in all courses (major and non-major) required for the major in mathematics is 120 (122 for Teacher Licensure Option if the collateral is chosen in a biological or physical science).

MINOR
A minor in mathematics consists of Mathematics 201, 202, and 203 plus nine additional semester hours above the 203-level. At least six of those additional hours must be at the 300-level or higher. Mathematics 270 and 370 cannot be used to satisfy the requirements for a minor in mathematics.

COLLATERAL
A collateral in mathematics consists of Mathematics 201 and 202 plus six semester hours above the 202 level. Mathematics 270 and 370 cannot be used to satisfy the requirements for a collateral in mathematics.

OTHER INFORMATION
During registration, beginning students at FMU are placed by members of the Department of Mathematics in their first mathematics course. Adjustments to the following placements may be made due to low scores on the Verbal Section of the SAT. Equivalent ACT scores are used for students who did not take the SAT. Students who took an AP Calculus AB course in high school and scored a five on the examination or an AP Calculus BC course and scored a three or higher on the examination are typically placed in Mathematics 203; those who scored a three or four on the AP Calculus AB examination are advised to enter Mathematics 202; those who scored a one or two are typically placed in Mathematics 201. Students with a strong high school background in both algebra and trigonometry and who make 570 or higher on the Quantitative Section of the SAT are typically placed in Mathematics 201. Beginning students with a strong background in algebra but little or no background in trigonometry and at least 540 on the Quantitative Section of the SAT are typically placed in either Mathematics 131, Mathematics 132, Mathematics 134, Mathematics 137, Mathematics 140, or Mathematics 170 based on their chosen major. Students who have had at least two years of high school algebra and who make between 460 and 530, inclusively, on the Quantitative Section of the SAT are typically placed in either Mathematics 111 or Mathematics 121 based on their chosen major. Students who have less than two years of high school algebra or who make less than 460 on the Quantitative Section of the SAT are typically placed in Mathematics 105 or Mathematics 105E/105L based on their chosen major. Mathematics 105 and Mathematics 105E/105L are also available to older students who are not recent high school graduates. Students who disagree with their placements in their initial mathematics course may see the department chair or his/her designee by the third day of the semester to schedule a Mathematics Placement Test.

Mathematics 105 and Mathematics 105E and 105L, while earning credit toward graduation, will not satisfy any of the six hours of Mathematics in the General Education Requirements.

Mathematics 170, 270, and 370 are designed for students seeking South Carolina Teacher Licensure in early childhood education or in elementary education or a B.G.S. in Educational Studies. It should be noted that a grade of C or higher in Mathematics 111 or a score of 540 or more on the Quantitative Section of the SAT is the prerequisite for Mathematics 170.

Many areas of concentration require completion of Mathematics 132 or 134 as preparation for certain applied courses.

Students who complete General Education Requirements for a B.A. by taking Mathematics 111 and Logic should consider the restriction such selections place on future choices of a major.

Mathematics 134 is required for majors in business, nursing, middle level education, and medical technology and is recommended for majors in sociology, history, and psychology.

No student can later take for credit any mathematics course that was a prerequisite (or was in the prerequisite sequence) for a mathematics course for which he/she has already received credit UNLESS he/she is repeating that course in order to obtain a better grade or he/she obtains written permission from the department.

A student cannot receive credit for Mathematics 105, 105E/105L, 111, or 121 after receiving credit for any mathematics course numbered higher than 121. A student may repeat a course to raise a grade earned in that course.

MATHEMATICS COURSES (MATH)
105 College Algebra I (3) (Prerequisite: Placement Scores. A grade of C or higher in Mathematics 105 is required to advance to Mathematics 111 or Mathematics 121). F, S, SU. The study of real numbers and their operations and properties; order of operations including exponents and roots; linear equations and inequalities in one and two variables, their systems and applications; introduction to functions and graphs; and the study of polynomials and their operations. Earns credit toward graduation but will not satisfy any of the six hours of Mathematics in the General Education Requirements. Credit cannot be given for both Mathematics 105 and Mathematics 110.

105E College Algebra I with Extended Studio (3) (Corequisite: Mathematics 105L) A grade of C or higher in Mathematics 105 (or in Mathematics 105E) is required for the student to advance to Mathematics 111 or Mathematics 121. Mathematics 105E is the equivalent of Mathematics 105 (see catalog description for MATH 105) with a studio component that complements learning experiences by providing additional individualized instruction and assistance with the development of course assignments, emphasizing process, and problem solving. Credit cannot be earned for both Mathematics 105 and Mathematics 105E.

105L Extended Studio (1:3) (Corequisite: Mathematics 105E) Extended studio time and space for students enrolled in Mathematics 105E. The studio component complements the Mathematics 105E learning experiences by providing additional individualized instruction and assistance with the development of course assignments, emphasizing process and problem solving.

111 College Algebra II (3) (Prerequisite: Grade of C or higher in Mathematics 105 or Mathematics 105E and 105L or placement scores. The grade of C or higher is required in Mathematics 111 to enroll in any higher numbered mathematics course for which Mathematics 111 is a prerequisite.) F, S, SU. The study of polynomials, their operations and factoring, operations with and simplifying rational expressions, roots and radicals, quadratic equations and inequalities, graphs of non-linear functions and the conic sections; exponents and logarithmic functions. Credit cannot be given for both Mathematics 111 and 121.

121 Introduction to Mathematical Modeling and Problem Solving (3) (Recommended for non-math and non-science majors) (Prerequisite: Grade of C or higher in Mathematics 105E and 105L or placement scores or permission of the department.) The study of algebra and polynomial functions and operations to include linear and nonlinear functions, data analysis, basic statistics, and linear regression in applications setting. Credit cannot be given for both Mathematics 111 and 121.

131 Mathematical Modeling and Problem Solving (3) (Prerequisite: Grade of C or higher in Mathematics 111 or Mathematics 121 or placement scores) F, S, SU. This course uses mathematics to solve real-world problems. A mathematical model is a representation of a scenario that is used to gain understanding of some real-world problem and to predict future behavior. The modeling cycle encompasses formulating a problem as a mathematical model, analyzing the mathematical model, calculating solutions, and validating results.

132 College Trigonometry with Analytic Geometry (3) (Prerequisite: Grade of C or higher in Mathematics 111 or placement scores) F, S, SU. College trigonometry, to include trigonometric identities as well as the inverse trigonometric functions, parabolas, ellipses, and hyperbolas. Credit toward graduation cannot be earned for both Mathematics 137 and