

# MATHEMATICS (B.S.)

The Bachelor of Science degree in Mathematics prepares students for jobs requiring quantitative, analytical, and critical mathematics skills. We prepare our students to carry out postgraduate studies and research of international excellence spanning broadly pure mathematics, computational and applied mathematics, statistics, and computational data-enabled science and engineering. We foster collaborations with high-tech industries and government agencies with the goal of creating career paths for our students. We strive to showcase the relevance and pervasiveness of mathematics in the modern economy through regular outreach activities.

The Bachelor of Science in Mathematics curriculum develops general qualitative, quantitative, and reasoning skills in mathematics. Our graduates pursue advanced studies in mathematics and seek careers as mathematicians in emerging high-tech industries and federal and state agencies. The overall employment of mathematicians is projected to grow 33 percent from 2020 to 2030, much faster than the average for all occupations.

## Other Requirements/Offerings

To receive the BS or BS Ed degree, a student must maintain an overall GPA of at least 2.0 and at least 2.5 in all core mathematics or statistics and English courses. The total number of hours of coursework for the BS or BS Ed is at least 120 or 124 semester hours, respectively. In addition, to receive the BS Ed degree a student must be admitted to the Teacher Education Program which is sought through the College of Education and Human Development. Students interested in entering teacher education should see the Requirements for Admission to Teacher Education in this issue of the Jackson State University Undergraduate Catalog under the College of Education and Human Development.

## Major Requirements

Code	Title	Hours
MATH 241	CALCULUS I WITH LABORATORY	3
MATH 242	CALCULUS II WITH LABORATORY	3
MATH 243	CALCULUS III WITH LABORATORY	3
MATH 244	CALCULUS IV WITH LABORATORY	3
MATH 303	INT TO SET THEO & LOGC I	3
MATH 311	ABSTRACT ALGEBRA I	3
MATH 321	MODERN GEOMETRY I	3
MATH 331	LINEAR ALGEBRA & MATRIX THEORY	3
MATH 351	ADVANCED CALCULUS I	3
MATH 355	PROBABILITY&STATISTICS I	3
MATH 368	DIFFERENTIAL EQUATIONS	3
MATH 403	SEMINAR IN MATHEMATICS	3
MATH 451	GENERAL TOPOLOGY I	3
Mathematics Elective		3
Mathematics Elective		3
<b>Total Hours</b>		<b>45</b>

## Concentration-Specialization Courses

### Pure Mathematics

- Alegbra
- Analysis

- Complex Variables
- Geometry
- Number Theory
- Set Theory and Log

### Applied Mathematics

- Differential Equations
- Financial Mathematics
- Mathematical Modeling
- Numerical Analysis
- Operations Research
- Probability and Statistics

## Curriculum Map

Course	Title	Hours
<b>Freshman</b>		
<b>Fall</b>		
ENG 104 or ENG 103 or ENG 111	COMPOSITION I or English Composition I with Co-requisite Support or COMPOSITION & LITERATURE FOR L	3
Humanities & Fine Arts Option		3
Social & Behavioral Science Option		3
MATH 241	CALCULUS I WITH LABORATORY	3
UNIV 100	UNIVERSITY SUCCESS	2
<b>Hours</b>		<b>14</b>
<b>Spring</b>		
ENG 105 or ENG 112	COMPOSITION II or COMPOSITION	3
MATH 242	CALCULUS II WITH LABORATORY	3
Humanities & Fine Arts Option		3
Natural Science Option		3
Pathway Option		3
<b>Hours</b>		<b>15</b>
<b>Sophomore</b>		
<b>Fall</b>		
MATH 243	CALCULUS III WITH LABORATORY	3
Humanities & Fine Arts Option		3
Natural Science Option		3
Social & Behavioral Science Option		3
Pathway Option		3
<b>Hours</b>		<b>15</b>
<b>Spring</b>		
CSC 118	COMPUTER SCIENCE I	3
MATH 244	CALCULUS IV WITH LABORATORY	3
MATH 303	INT TO SET THEO & LOGC I	3
UNIV 200	CIVIC ENGAGEMENT	1
Science Elective with Lab		4
Pathway Option		3
<b>Hours</b>		<b>17</b>
<b>Junior</b>		
<b>Fall</b>		
MATH 331	LINEAR ALGEBRA & MATRIX THEORY	3
MATH 368	DIFFERENTIAL EQUATIONS	3
General Elective		3
General Elective		3
Science Elective with Lab		4
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
MATH 321	MODERN GEOMETRY I	3
MATH 355	PROBABILITY&STATISTICS I	3

General Elective		3
Math Elective		3
<b>Hours</b>		<b>12</b>
<b>Senior</b>		
<b>Fall</b>		
MATH 311	ABSTRACT ALGEBRA I	3
MATH 351	ADVANCED CALCULUS I	3
General Elective		3
Math Elective		3
Science Elective with Lab		4
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
MATH 403	SEMINAR IN MATHEMATICS	3
MATH 451	GENERAL TOPOLOGY I	3
Mathematics Elective		3
General Elective		3
General Elective		3
<b>Hours</b>		<b>15</b>
<b>Total Hours</b>		<b>120</b>

- Effectively use mathematical notations and vocabulary to communicate mathematics in written form, oral presentations, and visual representations.

**Notes:**

- Candidates that transfer 12 or more hours of college credit are exempt from UNIV 100 UNIVERSITY SUCCESS; however, the student must take 2 hours of general electives to replace the UNIV course.
- General electives must be taken with the consultation of the department academic advisor.
- Online Graduation Clearance (**to be completed during the graduating semester only**).

## Specialization Courses

Code	Title	Hours
<b>Pure Mathematics</b>		
MATH 311	ABSTRACT ALGEBRA I	3
MATH 431	REAL ANALYSIS I	3
MATH 441	COMPLEX ANALYSIS I	3
MATH 321	MODERN GEOMETRY I	3
MATH 451	GENERAL TOPOLOGY I	3
<b>Applied Mathematics</b>		
MATH 415	PARTIAL DIFF EQUATIONS I	3
MATH 466	OPERATIONS RESEARCH	3
<b>Applied Statistics (See Advisor)</b>		

## Student Learning Outcomes

Upon the completion of the BS Degree requirements in mathematics, recipients will be able to:

- Solve real world problems using calculus methods.
- Combine mathematical methods to solve real world complex problems.
- Identify and utilize appropriate techniques to prove mathematical statements.
- Use appropriate algorithms, numerical methods, and computational technology to perform calculations and solve mathematical problems, and