Course Descriptions

Mathematics Department

HHS math department blends award-winning educators with innovative, student-focused instruction that inspires a love for learning. Consistently earning some of the highest standardized test scores in the state, we offer dynamic course options and strong academic supports to ensure every student thrives.

Course Offerings in Mathematics

Students are required to earn four (4) math credits and should be enrolled in a math course each year.

Mathematics Course Sequences

Grade 9	Grade 10	Grade 11	Grade 12
Algebra I: Part I and Part II	Geometry	Algebra II	*Level I*: Mathematical Reasoning for Decision Making *Level II*: Pre-Calculus Statistics *Level III*: Statistics AP College Algebra DE* **&** Trigonometry DE* Statistics: Probability & Statistics DE* **&** Foundations of Math DE*
Algebra I Honors	Geometry Honors	Algebra II Honors	Pre-Calculus AP Statistics AP College Algebra DE* **&** Trigonometry DE* Statistics: Probability **&** Statistics DE* & Foundations of Math DE*
Geometry Honors	Algebra II Honors	Pre-Calculus AP Statistics AP	Calculus AB AP Pre-Calculus AP Statistics AP Calculus AB AP *AND* Calculus BC AP
Algebra II Honors	Pre-Calculus AP	Calculus AB AP *AND* Calculus BC AP	Calculus III DE Differential Equations DE

.5 Credit Course

Course Offerings in Mathematics

Algebra I: Part I and Part II

Algebra I emphasizes linear and quadratic expressions, equations, and functions. This course also introduces students to polynomial, rational and exponential functions with domains in the integers. Students explore the structures of and interpret functions and other mathematical models. Students build upon previous knowledge of equations and inequalities to reason, solve, and represent equations and inequalities numerically and graphically. The TI-84 graphing calculator is highly recommended.

Success in Algebra I is crucial to a student's mathematical understanding necessary to access later courses in sequence. Students will have access to a summer skills review focused specifically on previous standards, principles, and mathematical vocabulary to support early success, which we strongly encourage students to complete.

*Transfer students or students newly entering GMSD with an Algebra I credit may be required to complete a placement exam to determine proper placement or to award credit, as Algebra I is a course which must appear on a student's transcript.

Credits: 1.0	Grade Level: 9
Prerequisite: None	
Special Note: Successful completion of Algebra I Part I and Part II will satisfy the Algebra I graduation requirement.	

Algebra I Honors

Algebra I Honors is designed for students with an enriched or accelerated 8th grade math background who are in need a more challenging approach to Algebra I. More emphasis will be placed on understanding and applying the different sets of real numbers; on developing the concept of functions; on establishing connections between graphs, equations, and numerical patterns; and on solving a greater variety of applications. The TI-84 graphing calculator is highly recommended.

*Transfer students or students newly entering GMSD with an Algebra I credit, may be required to complete a placement exam to determine proper placement or to award credit, as Algebra I is a course which must appear on a student's transcript.

Credits: 1.0	Grade Level: 9
Prerequisite: Teacher recommendation; Memo of understanding	

Geometry

Geometry emphasizes similarity, right triangle trigonometry, congruence, and modeling geometry concepts in real life situations. Students build upon previous knowledge of similarity, congruence, and triangles to prove theorems and reason mathematically. This course also introduces students to geometric constructions and circles. Students show a progression of mastery and understanding of the use and application of surface area and volume.

Success in Geometry depends in part on students' understanding of basic Algebraic concepts. As such, students will have access to a summer skills review focused specifically on previous standards, principles, and mathematical vocabulary to support early success, which we strongly encourage students to complete.

Credits: 1.0	Grade Level: 9-10
Prerequisite: Completion of Algebra I	

Geometry Honors

Geometry Honors is designed for students who are strong in problem solving and who want a more challenging approach to Geometry. These students typically plan to take Calculus AP. Emphasis is placed on rigor of the following: analysis and proof, conceptual understanding, procedural skill and fluency, and application. Students are

expected to have competent algebra skills, so they perform at a faster pace to cover all required topics including solid geometry, transformations, and trigonometry.

Credits: 1.0	Grade Level: 9-10
Prerequisite: Completion of Algebra I; Teacher recommendation; Memo of understanding	

Algebra II

Algebra II emphasizes polynomial, rational and exponential expressions, equations, and functions. This course also introduces students to the complex number system, basic trigonometric functions, and foundational statistics skills such as interpretations of data and making statistical inferences. Students build upon previous knowledge of equations and inequalities to reason, solve, and represent equations and inequalities numerically and graphically. The TI-84 graphing calculator is highly recommended.

Algebra II is a mathematical reasoning course which requires the knowledge and skills covered in Algebra I. As such, students will have access to a summer skills review focused specifically on previous standards, principles, and mathematical vocabulary to support early success, which we strongly encourage students to complete.

Credits: 1.0	Grade Level: 10-11
Prerequisite: Completion of Geometry	

Algebra II Honors

Algebra II Honors is designed for students who are strong in problem solving and prepared for a more challenging approach to Algebra II. Typically, these students will be planning to take an Advanced Placement or Dual Enrollment course the following semester/year. Much emphasis will be placed on using critical-thinking skills and solving a greater variety of problems. The TI-84 calculator is required. The TI-84 graphing calculator is highly recommended.

Credits: 1.0	Grade Level: 10-11
Prerequisite: Completion of Geometry; Teacher recommendation; Memo of understanding	

Pre-Calculus

Pre-Calculus is designed to prepare students for Calculus and other college-level math courses. During the first semester, students will deepen their understanding from Algebra II of function behavior (linear, quadratic, polynomial, root, rational, exponential, logarithmic) and will study applications of different types of functions. During the second semester, students will study analytic trigonometry and applications of trigonometric functions, polar coordinates, basics of vectors, conic sections, systems of equations, and sequences & series. It is recommended that students have strong algebra skills and a good work ethic coming into this course. The TI-84 graphing calculator is highly recommended.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of Algebra II	

Pre-Calculus AP - *EPSO*

Pre-calculus AP is a college-level mathematics course that prepares students for the AP Precalculus Exam by focusing on functions, mathematical modeling, and change. Students analyze functions using symbolic, graphical, numerical, and verbal representations aligned to the College Board AP Precalculus Course and Exam Description. The course investigates polynomial, rational, exponential, logarithmic, and trigonometric functions, emphasizing function behavior, transformations, composition, and inverses. Additional topics include sequences and series, rates of change, polar functions, and an introduction to limits, providing a strong foundation for college-level calculus.

Students engage in AP Mathematical Practices such as quantitative reasoning, constructing and communicating mathematical arguments, and modeling real-world phenomena. Instruction prioritizes algebraic fluency, symbolic

manipulation, and analytical reasoning. A TI-84 calculator is required, and students must pay the AP exam fee; a qualifying score may earn college credit.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of Algebra II; Teacher recommendation; Memo of understanding; AP exam fee; completion of AP exam	

College Algebra DE - *EPSO*

College Algebra DE covers analysis of functions (linear, quadratic, polynomial, root, rational, exponential, logarithmic), partial fractions, conic sections, theory of equations, inequalities, and applications, using graphing calculators. If there are questions about credit transfer, students should inquire with the universities/colleges of their choice. Students are responsible for a per semester tuition cost and a fee for textbooks. MATH 1710 & MATH 1720 are companion courses and are scheduled together to complete the course sequence. UofM Course: MATH 1710

Credits: .5	Grade Level: 11-12
Prerequisite: Completion of Algebra II; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Trigonometry DE - *EPSO*

Trigonometry DE covers trigonometric functions, analytic trigonometry, applications of trigonometric functions, polar coordinates, and vectors. If there are questions about credit transfer, students should inquire with the universities/colleges of their choice. Students are responsible for a per semester tuition cost and a fee for textbooks. MATH 1720 & MATH 1710 are companion courses and are scheduled together to complete the course sequence. UofM Course: MATH 1720

Credits: .5	Grade Level: 11-12
Prerequisite: Completion of College Algebra DE; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Calculus AB AP - *EPSO*

Calculus AB AP is a college-level calculus course and is designed to meet the requirements of the College Board advanced placement course. This course takes students through limits, derivatives, integrals and applications of both differentiation and integration. The TI-84 calculator is required. A final qualifying examination is required, and all students enrolled in the course must pay the fee for this examination. Receiving a qualifying score on the Advanced Placement exam may earn the student college credit.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Pre-Calculus AP; Teacher Recommendation; Memo of Understanding; Summer Enrichment Statement; AP exam fee; Completion of AP exam	

Statistics: Probability & Statistics DE - *EPSO*

Statistics: Probability and Statistics DE consists of underlying ideas of statistical and quantitative thinking; randomization in sample survey methods and design of experiments; double blind experiments and observational studies; descriptive and summary statistics; measurement errors; probability models; normal approximation; tests of significance and p-values, basic concepts of correlation and regression analyses. This course is designed more for non-STEM related majors. If there are questions about credit transfer, students should inquire with the universities/colleges of their choice. Students are responsible for a per semester tuition cost and a fee for textbooks.

The TI-84 graphing calculator is highly recommended. MATH 1530 & MATH 1420 are companion courses and are scheduled together to complete the course sequence. UofM Course: MATH 1530

Credits: .5	Grade Level: 11-12
Prerequisite: Completion of Algebra II; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Foundations of Math DE - *EPSO*

Foundation of Math DE now pairs with Statistics: Probability & Statistics DE to complete 6 hours of math through the University of Memphis. After completing Statistics: Probability and Statistics DE, students will continue a study of basic logic, propositions of truth values, analyzing arguments; approaches to problem solving; managing finances: compound interest, savings plans and investments, loan payments, credit cards and mortgages; fundamentals of statistical reasoning. MATH 1530 & MATH 1420 are companion courses and are scheduled together to complete the course sequence. UofM Course: MATH 1420

Credits: .5	Grade Level: 11-12
Prerequisite: Completion of Statistics: Probability & Statistics DE; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Statistics AP - *EPSO*

Statistics AP is an excellent option for any high school student who possesses sufficient mathematical maturity and quantitative reasoning ability. The purpose of Statistics AP is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: exploring data, planning a study, anticipating patterns, and statistical inference. This course requires mathematical thinking and analysis along with great reading, writing, and comprehension skills. The TI-84 calculator is integral to this course and will be used extensively. A final qualifying examination is required, and all students enrolled in the course must pay the fee for this examination. Receiving a qualifying score on the AP exam may earn the student college credit.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of Algebra II; Teacher Recommendation; Memo of Understanding; Summer Enrichment Statement; AP exam fee; Completion of AP exam	

Preparing for the ACT

Preparing for the ACT is designed to assist students in understanding the ACT, why it is important for their post-secondary readiness, and how to interpret their results and progress. The focus is to prepare for the ACT exam through instruction, practice, and familiarity with the structure and format of the ACT exam as well as to identify and use best practices for maximizing one's score such as "test tips," and strategies for dealing with test anxiety, and the benefits of retaking the exam.

Credits: .5	Grade Level: 10-12
Prerequisite: None	

Statistics

Statistics is designed to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. The major themes in Statistics include: interpreting categorical and quantitative data,

conditional probability and other rules of probability, using probability to make decisions, and making inferences and justifying conclusions. The TI-84 graphing calculator is highly recommended.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Algebra II	

Mathematical Reasoning for Decision Making

Mathematical Reasoning for Decision Making primarily focuses on the practical application and modeling of various mathematical concepts in multiple career settings. Students apply concepts such as counting, combinatorics, probability, financial math, and linear programming in professional contexts such as banking, industry, or human resources.

Credits: 1.0	Grade Level: 12
Prerequisite: Completion of Algebra II	

Calculus BC AP - *EPSO*

Calculus BC AP is a college-level calculus course and is designed to meet the requirements of the College Board advanced placement course. This course takes students through the topics in Calculus AB as well as polynomial approximations and series, the calculus of polar, parametric, and vector-valued functions, and advanced techniques of integration. The TI-84 calculator is required. A final qualifying examination is required, and all students enrolled in the course must pay the fee for this examination. Receiving a certain score on the Advanced Placement exam may earn the student college credit.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Pre-Calculus AP; Teacher Recommendation; Memo of Understanding; Summer Enrichment Statement; AP exam fee; Completion of AP exam	
Special Note: Students must enroll in Calculus AB AP in the fall and Calculus BC AP in the spring. Students will only pay for and take the Calculus BC AP exam.	

Calculus III DE ONLINE - *EPSO*

Calculus III DE includes instruction on multivariable calculus including three-dimensional analytic geometry and vectors, quadratic surfaces, arc length and curvature, limits and continuity, partial derivatives and their applications, tangent planes, optimization problems and Lagrange multipliers, multiple integrals, vector fields, line and surface integrals, Green's theorem, Stokes' theorem, the divergence theorem.

MATH 2110 & MATH 2120 are companion courses but are <u>not</u> required to be scheduled together to complete the course sequence. UofM Course: MATH 2120

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Calculus BC AP; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement	

***Calculus III DE ONLINE includes online instruction from faculty at the University of Memphis. The course is not a self-paced, asynchronous course, and students are required to meet expectations for performance and reach pacing milestones set forth by UofM and HHS.*

Differential Equations DE ONLINE - *EPSO*

As a companion to Calculus III, Differential Equations DE offers an introduction to ordinary differential equations, first order differential equations, linear differential equations of all orders; series methods for linear equations; Laplace transformations, systems of differential equations, and applications.

MATH 2120 & MATH 2110 are companion courses but are not required to be scheduled together to complete the course sequence. UofM Course: MATH 2120

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Calculus III DE ONLINE; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement	

***Differential Equations DE ONLINE includes online instruction from faculty at the University of Memphis. The course is not a self-paced, asynchronous course, and students are required to meet expectations for performance and reach pacing milestones set forth by UofM and HHS.*