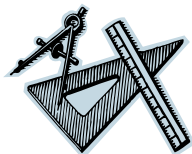

MATHEMATICS



The mission of the Hamilton Southeastern High School Mathematics Department is to challenge students to become mathematically powerful in an ever-changing world. Students of mathematics will practice logical thinking strategies, utilize technology to promote analytical thinking, and master concepts to solve various problems for all disciplines.

Topics in the next course build significantly on the topics in the previous course. Therefore, the requirements of the course must be met to enter a particular course. Students who have passed a more difficult course may not go back and take a lower level course. **When extraordinary circumstances exist, consult the guidance department in conjunction with the math department chairperson.**

For a more detailed look at all of our courses listed, visit the Indiana Department of Education website, <http://www.doe.in.gov/standards/docs-Math>

2520 ALGEBRA I (9, 10, 11, 12) This course provides a formal development of algebraic skills and concepts. Topics include properties of real numbers, solution and evaluation of equations, including linear and quadratic, and inequalities, graphing of linear equations and systems of equations, use of exponents, and introductory topics from statistics and probability.

2516 ALGEBRA ENRICHMENT (9, 10, 11, 12) Algebra Enrichment is a mathematics support course for Algebra I. The course provides students with additional time to build the foundations necessary for high school math courses, while concurrently having access to rigorous, grade-level appropriate courses. The five critical areas of Algebra Enrichment align with the critical areas of Algebra I: Relationships between Quantities and Reasoning with Equations; Linear and Exponential Relationships; Descriptive Statistics; Expressions and Equations; and Quadratic Functions and Modeling. Algebra Enrichment combines standards from high school courses with foundational standards from the middle grades. This course counts as a two credit Mathematics Course for the General Diploma only, or as an Elective for the Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas. A student taking Algebra Enrichment must also be enrolled in Algebra I during the same academic year. **Requirement: Recommendation of 8th grade math teacher.**

2532 GEOMETRY (9, 10, 11, 12) This course covers primarily plane geometry with some solid geometry topics. Topics include deductive and inductive reasoning, the study of angles, lines, planes, congruent and similar triangles, parallel lines, circles, coordinate geometry, trigonometric ratios, polygons, spheres, spatial drawings and three-dimensional relationships. **Requirement: Successful completion of both semesters of Algebra I, Recommendation: "C" average or above in Algebra I.**

2532 #GEOMETRY, HONORS (9, 10) This course is offered to students recommended as most able in mathematics. The development of theorems will necessitate a working knowledge of measurement, congruence, similarity, parallelism, perpendicularity, transformations, probability, perimeter, area, volume, trigonometry, and application of algebraic concepts to geometry. This course differs from regular Geometry in that more topics are studied, concepts are investigated in greater depth, pacing is faster, and proofs and algebra are integrated throughout the entire course. Students considering this course should be active, inquisitive, and independent learners. **Requirement: A "B" average in Algebra, nomination of 8th grade teacher, Recommendation: An "A" average in Algebra.**

2522 ALGEBRA II (9, 10, 11, 12) This course extends knowledge of algebra. Topics include properties of real numbers, functions, graphing in two dimensions, inequalities, properties of exponents, systems of equations, rational exponents, radicals, logarithms, polynomials and polynomial functions, complex numbers, sequences and series, probability, and the properties and graphs of conic sections. **Requirement: Successful completion of Algebra I. Recommendation: "C" average or above in Algebra I. This course may be taken at the same time as Geometry if the student has the written recommendation of his/her Algebra I teacher AND at least an "A" average in Algebra I.**

2522 #ALGEBRA II, HONORS (9, 10, 11) This course is offered to students recommended as most able in mathematics. The content of the course includes all topics in Algebra II, presented from a more abstract and theoretical standpoint. Additional topics include determinants, linear programming, matrices, limits, statistics and an introduction to trigonometry. The student will be asked to purchase a TI-83 or TI-84 graphing calculator. **Requirement: Successful completion of Honors Geometry. Recommendation: "B" or higher average in Honors Geometry**

2568 *PRE-CALCULUS (10, 11, 12) This is a one semester course that blends together all of the concepts and skills that must be mastered prior to enrollment in our college-level calculus courses. This course and Trigonometry are designed for students who will need Calculus as a required course for their major. Engineering, Science majors, Business majors, etc., will require a Calculus course in college. Topics include relations and functions, logarithmic and exponential functions, sequences, series, data analysis, mathematical reasoning and problem solving. Students will also advance their understanding of imaginary numbers through an investigation of polar coordinates and complex numbers. The student will be asked to purchase a TI-83 or TI-84 graphing calculator. **Requirement: Successful completion of Algebra I, Geometry, and Algebra II with a "B" average in each recommended.**

2566 *TRIGONOMETRY (10, 11, 12) This is a one semester course that provides the students with the skills and understandings that are necessary for advanced manipulation of angles and measurement. Trigonometry is the study of the measurement of triangles. Topics include, but are not limited to: solving right and oblique triangles, trigonometric identities, inverse trigonometric functions, and graphic trigonometric functions. This course is designed for students who expect Math to be a major component of their future college and career experiences, and as such it is designed to provide students with strong foundations for Calculus and other higher level math courses. The student will be asked to purchase a TI-83 or TI-84 graphing calculator. **Requirement: Successful completion of Pre-Calculus. Recommendation: "B" or higher average in Pre-Calculus.**

2564 #PRE-CALCULUS, HONORS (10, 11) This full year course is offered to students recommended as most able in mathematics. In addition to all of the topics of Pre-Calculus and Trigonometry, this course includes, but is not limited to: the concept of a limit, continuity, solving systems of three variables, matrices, trigonometric form of complex numbers, an introduction to derivative, and mathematical induction. All topics are approached from theory, applications are more in-depth, and the course is paced much faster than regular pre-calculus. The goal of this course is to prepare students to take Advanced Placement Calculus BC. The student will be asked to purchase a TI-83 or TI-84 graphing calculator. **Requirement: Honors Geometry and Honors Algebra II. Recommendation: "B" or above in Honors Algebra II.**

2530 *DISCRETE MATHEMATICS (10, 11, 12) This one-semester course is designed for students who will choose higher mathematics in college which may not necessarily include Calculus. Topics include linear programming, matrices, counting principles, recursion, logic, mathematical induction, set theory, graph theory, combinatorial analysis, probability, and elementary inferential and descriptive statistics. This course prepares students for college courses such as Finite Math. This course could be taken at the same time as Pre-Calculus or Calculus. Students will be asked to purchase a TI-83 or TI-84 graphing calculator for this course. **Requirement: Successful completion of Algebra II. Recommendation: A "B" average in Algebra II.**

2546 *PROBABILITY AND STATISTICS (10, 11, 12) This course is designed to aid students in applying statistical techniques in the decision making process. It is for a student who will choose higher math in college which may not include calculus. Calculus students are encouraged to take this concurrently with calculus. Topics include methods of data collection, organization of data, measures of central tendency, variation, empirical and classical approaches of probability, sampling theory, one sample hypothesis testing, and the beginnings of making inferences from a sample. Students will be asked to purchase a TI-83 or TI-84 graphing calculator. **Requirement: Successful completion of Algebra II. Recommendation: At least a "C" average in Algebra II.**

4512 BUSINESS MATHEMATICS (11, 12) Business Math is a business course designed to equip students with life application mathematics by developing and practicing essential skills. A solid understanding of core math operations (addition, subtraction, multiplication, division, and basic fractions), personal banking and financial budgeting (checkbooks, household budgets), math for public settings (i.e. percentages, estimation, rounding used in restaurants, grocery store, personal purchases), and use of math tools such as calculators and rulers, provides the necessary foundation for students as they enter adulthood and prepare for employment. Instructional strategies should include simulations, guest speakers, Internet research, and business experiences. **This course counts as a math credit towards a General Diploma only. This course does not count towards Core 40.**

2570 ##AP STATISTICS (10, 11, 12) This course is designed to aid students in applying statistical techniques in the decision making process. It is for a student who will choose higher math in college which may or may not include calculus. Students will be prepared to take the AP statistics exam upon completion of both semesters of the course. Both semesters will involve application and higher level thinking. In addition to all of the topics of regular Statistics, this course includes, but is not limited to, two sample hypothesis testing, correlation and regression analysis, variance analysis, and statistical process control. Topics have been chosen based on the core topic outline produced by AP Central and The College Board. Students will be asked to purchase a TI-83 or TI-84 calculator. **Requirement: Honors Algebra II with B recommended or Algebra II with A recommended. College Board recommends student should have PSAT scores of 65+ math, and 60+ verbal.**

***NOTE FOR ALL CALCULUS COURSES:**

Students will be given a math placement exam during the previous school year to aid in determining best calculus placement. The placement exam and the student's PSAT score will be used to determine Calculus course placement. Should a student wish to enroll in a calculus course other than placement exam indicates; parents will be required to sign a waiver form regarding the rigors of the course.

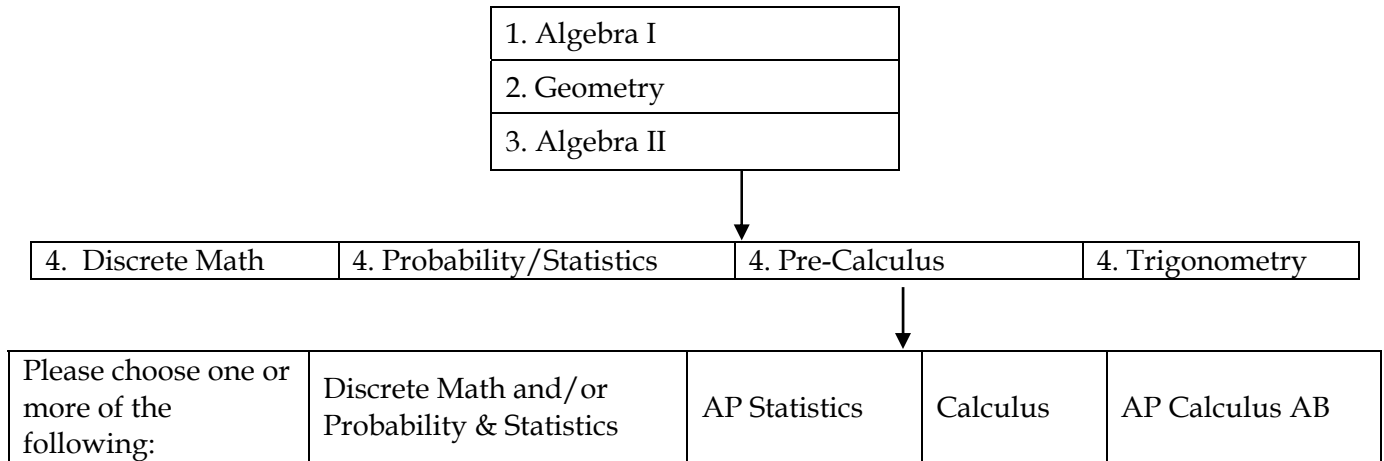
2544 #CALCULUS (ACP M119) (11, 12) This is a college course which will focus on preparation for majors in business and the social sciences. As part of Indiana University Advance College Project, students who enroll may apply to earn three (3) hours of college credit in Mathematics (M119), through Indiana University, Bloomington. Students will be billed discounted university fees in late fall. Credits are transferable to most colleges and universities throughout the country. Go to <http://acp.indiana.edu/> for more information. Students will be asked to purchase a TI-83 or TI-84 graphing calculator. Students enrolled through IU will receive dual credit: both high school and IU credit. Students choosing to take the MTH650/M119 course, whether for college credit or not, will receive a weighted grade for the second semester of the course. **Requirement: Successful completion of Pre-Calculus and note* above. Recommendation: "B" average in Pre-Calculus.**

2562 ##CALCULUS, AP AB (11, 12) This is a two-semester rigorous college level course that covers both differential and integral calculus. The goal of this course is to prepare the student to be successful on the AB Level of the Advanced Placement Exam in Calculus. As part of taking the AP test, students may be able to test out of one semester of college calculus and earn college credit depending on the university's requirement. This course as compared to M650 focuses also on the trigonometric applications of calculus. Science and engineering majors and students undecided about a college major but foresee calculus as part of their college course load would benefit from this course as opposed to MTH650. Students will be asked to purchase a TI-83 or TI-84 graphing calculator for this class. As part of the Indiana University Advance College Project, students who enroll in this course may apply to earn 4 hours of college math credit (M211) through IU Bloomington. University fees will be charged and credits are transferable to most colleges and universities throughout the country. Go to <http://acp.indiana.edu/> for more information. **Requirement: Successful completion of Pre-Calculus and Trigonometry, and note* above. Recommendation: A "B" average in Honors Pre-Calculus or an "A" average in Pre-Calculus.**

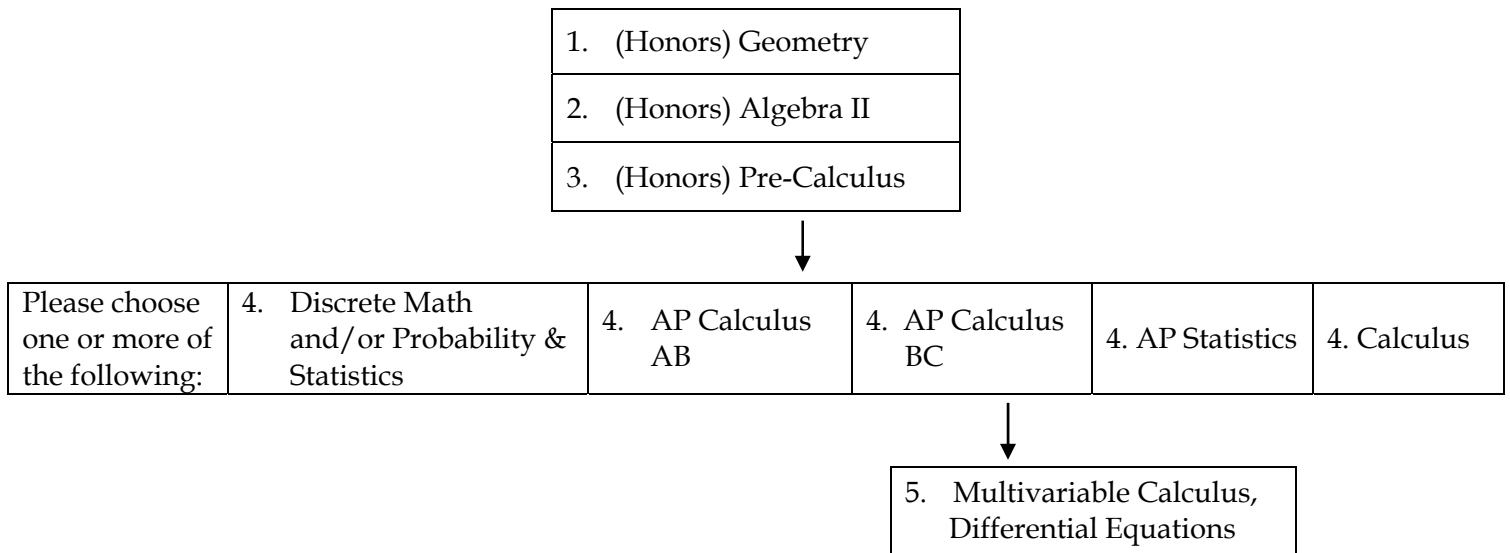
2572 ##CALCULUS, AP BC (11, 12) This is a very rigorous college-level course designed for highly motivated math students. The course covers all of the topics of AB Calculus as well as infinite series and sequences, additional techniques of integration, and additional topics in analytic geometry. The goal of this course is to prepare the student to be successful on the BC level of the Advanced Placement Exam in Calculus and in future college math courses. Students who are then very successful on the AP exam may test out of up to 2 semesters of college calculus. Students will be asked to purchase a TI-83/TI-84 graphing calculator for this class. As part of the Indiana University Advance College Project, students who enroll in this course may apply to earn 8 hours of college math credit (M211 & M212) through IU Bloomington. University fees will be charged and credits are transferable to most colleges and universities throughout the country. Go to <http://acp.indiana.edu/> for more information. Students who have taken Calculus AB may take Calculus BC second semester for credit. **Requirement: Successful completion of Honors Pre-Calculus and note* above. Recommendation: "A" average in Honors Pre-Calculus.**

Hamilton Southeastern High School Math Courses

Possible Math Course Sequence Beginning with Algebra I



Possible Math Course Sequence Beginning with Geometry or Algebra II



- * A student can earn college credit in AP Calculus AB, AP Calculus BC, and AP Statistics by scoring a 4 or 5 out of 5 on the AP exam.
- * A student can earn college credit for ANY of the three Calculus courses by taking it for dual credit through Indiana University Bloomington. Go to acp.indiana.edu for more information.
- * Students completing AP Calculus BC before their senior year may take Multivariable Calculus (1 sem) and Differential Equations (1 sem) via Distance Learning through Indiana Academy and Ball State University.