

MATHEMATICS

Mathematics is an integral part of every career as well as a necessity for the consumer. The mathematics program provides a variety of courses to meet the needs of individual students. Students should select a sequence of courses which provide the maximum challenge and which are appropriate for future educational and career goals. Careful attention should be paid to course prerequisites. Exceptions can be made by the Math Department Head.

MATHEMATICS COURSE DESCRIPTIONS

MATHEMATICS I (5101)

Full Year Credit 1.00 Weight 1.00

Prerequisites: This course is recommended for students in Grade 9.

Description: This course is intended for students needing remedial work in mathematics. Topics are selected to meet the needs of the individual students. Study areas include: basic operations with whole numbers; common fractions and decimals; ratio and percent; graphs; informal geometry; and measurement. Strong emphasis will be placed on the practical application of skills.

MATHEMATICS II (5102)

Full Year Credit 1.00 Weight 1.00

Prerequisites: This course is open to students in Grades 10, 11, and 12. Prior successful completion of Mathematics I is required.

Description: This course is intended for students who need continued remedial work on mathematical skills. Topics covered in the course will be a continuation and expansion of those topics in Mathematics I and the introduction of some topics from Transition Mathematics.

TRANSITION MATHEMATICS (5201)

Full Year Credit 1.00 Weight 1.02

Prerequisites: This course is open to students in Grades 9, 10, 11, and 12.

Description: This course is designed to bridge the gap between pre-secondary school and secondary school mathematics. The course will focus on the transition from the fundamental arithmetic skills emphasized in the middle school to the more abstract concepts to be covered in algebra and geometry.

APPLIED MATH - ALGEBRA TOPICS (5202)

One Semester Credit 0.50 Weight 1.02

Prerequisites: This course is open to students in Grades 10, 11, and 12. This course is NOT open to students who have previously earned Algebra credit.

Description: This course is designed to introduce students to some elementary algebra topics. The objectives of the course are to have students become familiar with and able to use variables, formulae, algebraic expressions, graphing concepts, and solve simple verbal problems.

APPLIED MATH - GEOMETRY TOPICS (5203)

One Semester Credit 0.50 Weight 1.02

Prerequisites: This course is open to students in Grades 10, 11, and 12. This course is NOT open to students who have previously earned Geometry credit.

Description: This course is designed to introduce students to some elementary geometry topics. The objective of the course is to have students become familiar with and able to use direct measurement (customary/metric), relationships and ratios in indirect measurement, symmetrical relationships, congruency and similarity, coordinate geometry to explore spatial relationships, and maximum-minimum relationships.

CONSUMER MATHEMATICS (Fall) (5206)

Fall Semester Credit 0.50 Weight 1.02

Prerequisites: This course is open to students in Grades 11 and 12. Prior successful completion of Transition Mathematics or Algebra I General is required. This course is NOT open to students who have completed Algebra II General or higher.

Description: Emphasis in this course is on consumer problems and the related mathematics. Study topics in the fall include: calculator skills, income and expenses, transportation costs, food buying, clothing costs, and personal banking. Students are encouraged to elect both semesters of this course.

CONSUMER MATHEMATICS (Spring) (5207)

Spring Semester Credit 0.50 Weight 1.02

Prerequisites: This course is open to students in Grades 11 and 12. Prior successful completion of Transition Mathematics or Algebra I General is required. This course is NOT open to students who have completed Algebra II General or higher.

Description: Emphasis in this course is on consumer problems and the related mathematics. Study topics include: calculator skills, taxes, housing insurance, investments, and credit. It is recommended that students elect both semesters of this course.

ALGEBRA I - GENERAL (5208)

Full Year Credit 1.00 Weight 1.02

Prerequisites: This course is open to students in Grades 9, 10, 11, and 12.Description: The course is designed for the student who is ready to begin a formal study of Algebra I but is not prepared for the rigor involved in Algebra I - College. The topics covered are parallel to those in Algebra I - College but are covered in less depth. Upon completion of this course it is recommended that the student elect either Geometry - General or Algebra I - College. Students should consider college requirements before selecting the next course in their math sequence.**GEOMETRY - GENERAL (5209)**

Full Year Credit 1.00 Weight 1.02

Prerequisites: This course is open to students in Grades 10, 11, and 12. Prior successful completion of Algebra I - General or College is required.Description: This course is intended for students who have completed Algebra I - General. The course content is similar to that of Geometry - College but with more emphasis on intuitive understanding of concepts and less emphasis on deductive proof. The course may not meet the standards set forth by some of the accredited four-year colleges. Study areas of the course include: basic geometric figures; angles; parallel and perpendicular lines; polygons; congruent and similar figures; and measurement of plane and solid figures.**ALGEBRA II - GENERAL (5210)**

Full Year Credit 1.00 Weight 1.02

Prerequisites: This course is open to students in Grades 10, 11, and 12. Prior successful completion of Algebra I – General or College is required.Description: This course is intended for students desiring further study in algebra and an introduction to trigonometry. Study areas include: a review of Algebra I concepts such as basic operations with signed numbers, solving linear equations & inequalities; operations with polynomials; factoring; ratio & proportion; algebraic fractions; formulas; systems of equations; radicals; quadratic equations; estimation of answers; problem solving; right angle trigonometry; and graphing in the Cartesian plane. This course may not meet the standards set forth by some of the accredited four-year colleges.**ALGEBRA I - COLLEGE (5302)**

Full Year Credit 1.00 Weight 1.04

Prerequisites: This course is open to students in Grades 9, 10, 11, and 12.Description: A student with a good background in arithmetic and planning to follow a college preparatory program should elect this course. Study areas include: directed numbers; equations and problem solving; solution of inequalities; operations with polynomials; fractional equations; coordinate graphs of ordered pairs and linear equations; sentences in two variables; radical expressions; and quadratic equations.**GEOMETRY - COLLEGE (5303)**

Full Year Credit 1.00 Weight 1.04

Prerequisites: This course is open to students in Grades 9, 10, 11, and 12. Prior successful completion of Algebra I - College is required.Description: This course incorporates plane, solid, and coordinate geometry. Study areas include: inductive and deductive reasoning; angles; parallel and perpendicular lines; congruent and similar figures; properties of triangles; quadrilaterals; ratio and proportions; right triangles and trigonometry; circles, area, volume, and surface area.**ALGEBRA II - COLLEGE (5304)**

Full Year Credit 1.00 Weight 1.04

Prerequisites: This course is open to students in Grades 10, 11, and 12. Prior successful completion of Algebra I - College and Geometry – College as well as teacher recommendation is required.Description: This course should be elected only by students with a strong foundation in Algebra I - College and Geometry - College. Study areas include: properties of real numbers; linear equations and inequalities; operations with functions including composition of functions and inverse functions; matrices and systems of equations; quadratic functions and complex numbers; polynomials; exponential functions; and logarithmic functions. Use of the TI-83 or TI-84 is required for this course.**ADVANCED MATHEMATICS I - COLLEGE (5305)**

Fall Semester Credit 0.50 Weight 1.04

Prerequisites: This course is open to students in Grades 11 and 12. Prior successful completion of Algebra II - General or College is required. This course is NOT open to students who have successfully completed Precalculus I - College or Honors and/or Precalculus II - College or Honors.Description: The Advanced Math sequence is intended for the student who plans to study in the area of liberal arts at the college level and who wishes additional preparation in mathematics. Study areas include: relations and linear functions; quadratic functions; polynomial functions; absolute value and linear and polynomial inequalities. Students are encouraged to select both semesters of this course.**ADVANCED MATHEMATICS II - COLLEGE (5306)**

Spring Semester Credit 0.50 Weight 1.04

Prerequisites: This course is open to students in Grades 11 and 12. Prior successful completion of Advanced Mathematics I - College is required. This course is NOT open to students who have successfully completed Precalculus II - College.Description: This course follows Advanced Math I - College. Study areas include: trigonometric functions; modeling periodic behavior, trigonometric equations and their applications; trigonometric identities; and applications of the Law of Sines and the Law of Cosines. Use of the TI-83 or TI-84 is required for this course. Students are encouraged to select both semesters of this course.

PRECALCULUS I - COLLEGE (5307)

Fall Semester Credit 0.50 Weight 1.04

Prerequisites: This course is open to students in Grades 11 and 12. Prior successful completion of Algebra II – College or Honors is required.

Description: This is the fourth course in the sequence including Algebra I - College, Geometry - College, and Algebra II - College. It is designed to prepare students for the study of calculus or other college math courses. Study areas include: inequalities and absolute value; functions and notation for functions; algebra of functions; composition and inversion of functions; circular functions; trigonometric functions; solving triangles; trigonometric identities; trigonometric graphs; inverse trigonometric functions; and applications of trigonometry.

PRECALCULUS II - COLLEGE (5308)

Spring Semester Credit 0.50 Weight 1.04

Prerequisites: This course is open to students in Grades 11 and 12. Prior successful completion of Precalculus I - College or Honors is required.

Description: This course follows Precalculus I - College. Study areas include: lines, circles, and ellipses; hyperbolas; parabolas; conic sections and intersections; binomial theorem; sequence and series; permutations and combinations; probability; statistical measures; and limits of functions.

GEOMETRY - HONORS (5401)

Full Year Credit 1.00 Weight 1.06

Prerequisites: This course is open to students in Grades 9, 10, 11, and 12. Teacher recommendation is necessary. Prior successful completion of Algebra I College is required.

Description: The scope and content of this course are designed for the student with high interest and ability in mathematics. The topics are similar to those covered in Geometry - College but are studied at a more advanced level and there is a heavy emphasis on geometric proofs.

ALGEBRA II - HONORS (5402)

Full Year Credit 1.00 Weight 1.06

Prerequisites: This course is open to students in Grades 10, 11, and 12. Prior successful completion of Geometry - College or Honors and teacher recommendation is required.

Description: This course is designed for the student with high interest and ability in mathematics. The topics are similar to those covered in Algebra II - College but are studied at a more advanced level. Study areas include: properties of real numbers; linear equations, matrices, and inequalities; systems of linear equations and inequalities; polynomials; rational algebraic expressions; sequences and series; properties or relations and functions; exponential and logarithmic functions; and probability. Use of a TI-83 or TI-84 is required for this course.

PRECALCULUS I - HONORS (5403)

Fall Semester Credit 0.50 Weight 1.06

Prerequisites: This course is open to students who have successfully completed Algebra II – College or Honors. Teacher recommendation is required.

Description: This course should be elected by students who have demonstrated high ability, performance, and interest in mathematics. Study areas include: trigonometric functions; inverse trigonometric functions, graphic trigonometric functions and their inverses; verifying identities; solving right triangle application problems; and evaluating trigonometric expressions.

PRECALCULUS II - HONORS (5404)

Spring Semester Credit 0.50 Weight 1.06

Prerequisites: Prior successful completion of and a good background in Algebra, Geometry, and Algebra II - College or Honors and Precalculus I – Honors is required. Teacher recommendation is necessary.

Description: This course follows Precalculus I - Honors. Study areas are applications of trigonometry law; Law of Sines; Law of Cosines; polar coordinates; parametric equations; analytic geometry; lines, normal, circles, parabolas, ellipses, and hyperbolas.

CALCULUS - HONORS (5405)

Full Year Credit 1.00 Weight 1.06

Prerequisites: This course is open to students in Grade 12. Successful completion of Precalculus II - College or Honors is required. Teacher recommendation is also necessary.

Description: This course is designed to prepare students for a rigorous two-semester Calculus course at the college level. Study areas include: review of functions; theory of limits; derivatives of polynomial and rational functions; implicit differentiation; applications of the derivative; mean value theorem; differential equations; definite integrals; fundamental theorem of integral calculus; application of the definite integral; differentiation and integration of transcendental functions; special methods of integration; and improper integrals.

STATISTICS - COLLEGE (5309)

Full Year Credit 1.00 Weight 1.04

Prerequisites: This course is open to students in Grades 11 & 12. Prior successful completion of Algebra II – College or Honors is required.

Description: Statistics can be studied concurrently with Precalculus or Calculus or elected following completion of Algebra II. Students are introduced to major statistical concepts, produce models using probability and simulation, and use statistical inference to confirm models. As well as enriching a strong background in mathematics, this course prepares students for the study of statistics required for many collegiate majors. The use of a TI-83 or TI-84 is required.

STATISTICS - HONORS (5406)

Full Year

Credit 1.00

Weight 1.06

Prerequisites: This course is open to students in Grades 11 and 12. Prior successful completion of Algebra II - College or Honors is required. Teacher recommendation is necessary.

Description: Statistics can be studied concurrently with Precalculus or Calculus or elected following the completion of Algebra II. Students are introduced to major statistical concepts in more depth than in the Statistics – College course, produce models using probability and simulation, and use statistical inference to confirm models. As well as enriching a strong background in mathematics, this course prepares students for the study of statistics required for many collegiate majors. The Advanced Placement exam is optional for students in this course. The use of a TI-83 or TI-84 is required for this course.

ADVANCED PLACEMENT CALCULUS AB (5501)

Full Year

Credit 1.00

Weight 1.08

Prerequisites: This course is open to students in Grade 12. Prior successful completion of Precalculus II - College or Honors is required. Teacher recommendation is necessary.

Description: This course is intended for students who wish to pursue college level studies while still attending a secondary school. Areas of study will be: elementary functions, differential calculus, and integral calculus, with the inclusion of all topics as suggested by the College Entrance Examination Board. All students taking the course will be required to take (and pay for) the Advanced Placement Examination in the spring.

INDEPENDENT STUDY IN MATHEMATICS

Credit and weight by Arrangement

Prerequisites: Approval of Housemaster, Mathematics department staff, and Guidance Counselor is required.

Description: Independent study is offered to students who have successfully completed other math classes and who wish to continue their study *in a specific area where there is no advanced offering*. The student will write a plan of activities as outlined in the Mathematics department's and RHS guidelines.