MATHEMATICS

Math Course Pathways

	Level				
	1	**2**	**3**	**4**	**5**
Initial Placement	Transition to HS Math	Algebra 1	Geometry	**Algebra 2**, or **Elective:** Data Science*	**Algebra 2**, or **Elective:** Data Science*
	Algebra 1	Geometry	Algebra 2, or **Elective:** Data Science*	**Elective:** Data Science **Honors Electives**: College Prep Math Probability & Statistics	**Elective:** Data Science **Honors Electives:** Trigonometry, Pre-Calculus
	Algebra 1 - Honors	Geometry – Honors	Algebra 2 – Honors, or **Elective:** Data Science*	**Elective:** Data Science **Honors Electives:** Trigonometry, Pre-Calculus	**Elective:** Data Science **Honors Electives:** AP Statistics AP Calculus AB

Notes
- Students must complete three years of mathematics to graduate. BFHS *highly recommends* that all students complete four years of math, regardless of their post-secondary plans.
- Students may move vertically with appropriate mastery in the previous level with the consent of their instructor.
- Students wishing to maintain working at the honors level must maintain at least a B in their prerequisite course.
- BFHS offers six different honors elective math courses and one non-honors elective course that students may take after Algebra 2. Additionally, BFHS offers AP Calculus BC via distance learning.
- (*) Explorations in Data Science is a junior- and senior-level, project-based, non-honors, elective course. Although Algebra 2 is not a prerequisite, BFHS recommends taking Algebra 2 *before* taking Data Science.

Transition to High School Math
1.0 Credit: Yearlong
Placement by BFHS Math Department
This course provides the mathematical background, skills, and thinking processes necessary for the successful completion for Algebra 1. Topics include whole numbers; integers; simplifying equations; factors and fractions; rational numbers; ratios, proportions, and percent's; functions and graphing; solving equations and inequalities. The instructional program of this course provides for the understanding and use of the concepts as well as their application through appropriate problem-solving situations. Successful completion of this course will help students to continue to investigate the aforementioned concepts at a more rigorous level. Students should consult their current math teacher or the high school
math department for placement in this or any math course.

Algebra 1
1.0 Credit: Yearlong
Prerequisite: None
This course is the first of a three-year series of traditional math courses that build upon the theme of mathematics by subject area study. Through modeling and problem solving, students develop a rich understanding of mathematical topics. Topics include expressions and equations, linear functions, polynomial and nonlinear functions, radical and
rational functions and data analysis.

Algebra 1 - Honors
1.0 Credit: Yearlong
Placement by BFHS Math Department
This course is intended for college-bound students and is an extension of the Algebra 1 course. Students who are advanced in their mathematical reasoning, comprehension and study skills will benefit from taking this class. Although the topics parallel Algebra 1, this course will provide increased rigor and move at a faster pace than that found in Algebra 1. Topics include expressions and equations, linear functions, polynomial and nonlinear functions, radical and rational functions and data analysis.

Algebra 2
1.0 Credit: Yearlong
Prerequisite: Algebra 1 or Algebra 1 - Honors
This course is the third of a three-year series in the traditional math courses that build upon the theme of mathematics by subject area study. Algebra 2 students extend their math skills and knowledge to new situations and problems. Topics include first degree equations and inequalities, polynomial and radical equations and inequalities, advanced functions and relations, discrete mathematics and trigonometry. Upon completion, students will have completed the prerequisite math concepts needed to enter elective honors courses in mathematics: AP Statistics, College Prep Math, Probability and Statistics, Trigonometry or Pre-Calculus.

Algebra 2 - Honors
1.0 Credit: Yearlong
Prerequisite: Geometry 1 - Honors
This course is intended for college-bound students and is an extension of the Algebra 2 course. Students who are advanced in their mathematical reasoning, comprehension and study skills will benefit from taking this class. Although the topics parallel Algebra 2, this course will provide increased rigor and move at a faster pace than that found in Algebra 2. Topics include first degree equations and inequalities, polynomial and radical equations, advanced functions and relations, discrete mathematics and trigonometry. Upon completion, students will have completed the prerequisite math concepts needed to enter elective honors courses in mathematics: AP Statistics, College Prep Math, Probability and Statistics, Trigonometry or Pre-Calculus.

Geometry 1
1.0 Credit: Yearlong
Prerequisite: Algebra 1 or Algebra 1-Honors
This course is the second of a three-year series of traditional math courses that build upon the theme of mathematics by subject area study. Geometry students will use their deeper understanding to apply their math skills and knowledge to shapes and spatial reasoning. Topics include lines and angles, triangles (including trigonometry), quadrilaterals, circles, area, and volume.

Geometry 1 - Honors
1.0 Credit: Yearlong
Prerequisite: Algebra 1 or Algebra 1- Honors
This course is intended for college-bound students and is an extension of Geometry course. Students who are advanced in their mathematical, reasoning, comprehension, and study skills will benefit from taking this course. Although the topics are parallel Geometry, this course will provide increased rigor and move at a faster pace than that found in Geometry. These students will apply their math skills and knowledge to shapes and spatial reasoning. Topics include lines and angles, triangles (including trigonometry), quadrilaterals, circles, area, and volume.

College Prep Mathematics - Honors
0.5 Credit: Semester
Prerequisite: Algebra 2
This one-term elective course continues to develop mathematical concepts to prepare students for college and careers after high school. Topics will include solving systems of linear equations, function characteristics, families of functions, algebraic functions, roots of polynomials, rational equations, sequences and series, combinatory, the binomial theorem, and matrices.

Probability and Statistics - Honors
0.5 Credit: Semester
Prerequisite: Algebra 2 or Algebra 2 - Honors
This one-term elective course will introduce probability and statistics concepts to prepare students for college and careers after high school. Students will participate in activities, applications, and data explorations intended to give them an opportunity to investigate, discuss, and make use of statistical ideas and methods. [This is not an Advanced Placement (AP) course.] Topics will include picturing distributions with graphs, describing distributions with numbers, the normal distribution, scatterplots and correlation, regression, two-way tables, random variables, probability rules, sampling distributions, sampling methods, experimental design, and an introduction to inference.

Exploration in Data Science
1.0 Credit: Yearlong
Prerequisite: Algebra 1 or Algebra 1-Honors
This course will introduce students to the main ideas in data science through free tools such as Google Sheets, Python, Data Commons and Tableau. Students will learn to be data explorers in project-based units, through which they will develop their understanding of data analysis, sampling, correlation/causation, bias and uncertainty, probability, modeling with data, making and evaluating data-based arguments, the power of data in society, and more! At the end of the course students will have a portfolio of their data science work to showcase their newly developed abilities.

Trigonometry - Honors
0.5 Credit: Semester
Prerequisite: Algebra 2 or Algebra 2 - Honors
This one-term elective course continues to develop trigonometric concepts to prepare students for college and careers after high school. We advise students wishing to take higher-level mathematics (e.g. AP Calculus) courses to enroll in this course. Topics will include right triangle ratios, the unit circle, radian measure, graphs of trigonometric functions, inverse trigonometric functions, trigonometric identities, and vectors.

Pre-Calculus - Honors
0.5 Credit: Semester
Prerequisite: Trigonometry - Honors
This one-term elective course will prepare students for math- and science-related fields such as Calculus. We advise students wishing to take higher-level mathematics (e.g. AP Calculus) courses to enroll in this course. Topics will include function characteristics, conic sections and coordinate geometry, exponential and logarithmic functions, solving exponential and logarithmic equations, limits, and parametric equations.

AP Calculus AB - Honors
1.0 Credit: Yearlong
Prerequisite: Pre-Calculus AND Approval from BFHS Math Department
Advanced Placement (AP) Calculus AB is equivalent to a one-semester, introductory college course in calculus. Potential students should demonstrate mastery of material from courses that are the equivalent of four full years of high school mathematics before attempting calculus. This course is both challenging and demanding.
AP Calculus is primarily concerned with developing the students' understanding of the concepts of calculus and providing experience with its methods and applications. The course emphasizes a multi-representational approach to calculus, with concepts, results, and problems expressed graphically, numerically, analytically, and verbally. Students will use technology to help solve problems, experiment, interpret results, and support conclusions.
Students will explore calculus using the following broad conceptual themes:
- Functions: Graphs, Limits, Continuity & Asymptotic Behavior
- Derivatives: Rates of Change, Local Linearity, Related Rates, & Optimization
- Integrals: Riemann sums, Definite Integrals, Anti-derivatives & the Fundamental Theorem of Calculus, Net accumulation of Change, Differential Equations
- Mathematical Modeling: Applications, Approximation & Reasonableness of Solutions

Students who successfully complete this course and the national Advanced Placement exam in the spring may receive college credit and/or advanced placement

AP Calculus BC – Honors (Distance Learning)
1.0 Credit: Yearlong
Prerequisite: Pre-Calculus AND Approval from BFHS Math Department
This course begins with a review of the AB Calculus topics, covered at a much faster pace. In addition to the AB topics, students study Taylor's formula, polar coordinates, infinite and power series, and vectors in a plane.

AP Statistics - Honors
1.0 Credit: Yearlong
Prerequisite: Algebra 2 or Algebra 2 - Honors AND Approval from BFHS Math Department
Advanced Placement (AP) Statistics is the equivalent of a one-semester, introductory, non-calculus-based, collegiate course in statistics. The purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. We expose students to four broad conceptual themes:
- Exploring Data: Describing patterns & departures from patterns
- Sampling & Experimentation: Planning & conducting a study
- Anticipating Patterns: Exploring random phenomena using probability & simulation
- Statistical Inference: Estimating population parameters & testing hypotheses

The course emphasizes a multi-representational approach to statistics with concepts, results, and problems expressed graphically, numerically, analytically, and verbally. Students will frequently use technology to create mathematical models and simulations. Students who successfully complete this course and the national Advanced Placement exam in the spring may receive college credit and/or advanced placement.