At this point in the path, students choose a two-year sequence commitment for Grade 11 and Grade 12. Selections include those courses below the circle symbol.
The Harrison High School Mathematics Department is committed to providing students with a challenging mathematics program. It is designed to enable students to gain confidence in their own mathematical ability, enhance their critical thinking and mathematics communication skills, and to connect their experiences in mathematics to the real world. All of our students are encouraged to take four years of mathematics to better meet the demands of our 21st century global society. To achieve this goal, we offer a variety of courses to meet the needs and interests of all students. Recommended prerequisites may be waived under rare circumstances where students demonstrate unusual and outstanding capacities for moving ahead.

**ALGEBRA 1**

*Course No.: 314c  Grades Offered: 9  Credit: 1.0  Examination: Algebra I Regents*

This is the first in the three-year sequence of Common Core State Standards of Mathematics. Successful completion of this course is the minimum requirement to receive a High School Diploma. The primary focus in this course is to develop a strong foundation in relationships between quantities, and reasoning with equations and their graphs. The topics of study include: descriptive statistics, linear and exponential functions, polynomial and quadratic expressions, equations and functions, and a synthesis of modeling with equations and functions. The intent is for students to demonstrate their mathematical thinking through modeling, constructing arguments, attending to precision in problems, and reasoning abstractly and quantitatively. It is required that students use a TI-84+ graphing calculator.

**TOPICS IN PRE-CALCULUS I**

*Course No.: 319  Grades Offered: 9  Credit: 0.5 (Alternate Day Full Year)  Examination: School Exam  Prerequisite: Algebra 1*

This course is designed for students who wish to accelerate themselves into BC calculus in 11th grade. It will meet every-other day and is designed to be taken at the same time as Geometry. Additionally, those highly motivated mathematics students who intend to take AP Calculus-BC will become very well prepared for the pre-requisite. It is recommended that students provide their own TI-83 or TI-84+ graphing calculator.

**DISCOVERY GEOMETRY**

*Course No.: 388  Grades Offered: 9  Credit: 0.5 (Alternate Day Full Year)  Co-requisite: Integrated Geometry*

This course is designed to gain deeper knowledge of the content from the Geometry curriculum. This course will highlight common areas of struggle for students. Alternative problem solving strategies will be an area of discussion. Topical reviews will occur for both the Geometry midterm and Regents exam.

**DISCOVERY TRIGONOMETRY**

*Course No.: 389  Grades Offered: 10  Credit: 0.5 (Alternate Day Full Year)  Co-requisite: Algebra II Trigonometry*

This course is designed to gain deeper knowledge of the content from the Algebra 2/Trigonometry Curriculum. This course will highlight common areas of struggle for students. Alternative problem solving strategies will be an area of discussion. Topical reviews for both the Algebra 2/Trig midterm and Regents exams will be included.

**APPLIED MATHEMATICS**

*Course No.: 334  Grades Offered: 10-11  Credit: 1.0  Examination: School Exam  Recommended Prerequisite: Algebra I*

This course is designed to reinforce algebraic mathematical concepts and introduce higher-level mathematics means), geometric compass with center-wheel, and a ruler.
inquiry. Students will be engaged in activities to investigate and expand on the concepts covered in the Algebra I curriculum. This course will conclude with the completion of a school exam or the Common Core Algebra I exam.

**Algebra / Trigonometry**  
Course No.: 365  Grades Offered: 9-10  
Credit: 1.0  Examination: School Exam

This course is designed for students who wish to strengthen their foundational algebra skills. Topics will build on those covered in Algebra I and II, and expand to include real world applications of trigonometry. The project based nature of this course is intended to develop critical thinking skills as well as prepare students for higher level math courses including IB.

**Geometry / Trigonometry**  
Course No.: 366  Grades Offered: 10-11  
Credit: 1.0  Examination: School Exam

The course will include selected topics from both Geometry and Trigonometry designed to provide foundational skills for higher level math courses. Therefore, students will need to have successfully completed Integrated Algebra and/or Algebra II Trigonometry courses. The project based nature of this course is intended to develop critical thinking skills, as well as prepare students for higher level math courses including IB.

**IB Math Studies SL**  
Course No.: 346  Grades offered: 11-12  
Credit: 1.0  Examination: Internal Assessment, IB Math Studies SL Exam  
Prerequisite: Courses taken in Algebra and Geometry

This is a one year IB math standard level course that focuses on a variety of mathematical concepts including algebra, statistics, logic, sets, probability, geometry, trigonometry and calculus. As an IB course, Math Studies will help students to communicate their mathematical understandings clearly and confidently. This course will culminate with an independent project where students will collect or generate measurements to analyze and evaluate the information. In addition, students are expected to sit for the IB Math Studies SL examinations in May. In accordance with the IB Syllabus, a TI-84+ graphing calculator is an essential tool for this course.

**IB Math Studies SL Yr 1 & Yr 2**  
Course No.: 347 (Yr 1) 348 (Yr 2)  
Credit: 1.0  Grades offered: 11-12  
Examination: Internal Assessment, IB Math Studies SL Exam  
Prerequisite: Courses taken in Algebra and Geometry

This is a two-year IB math sequence that focuses on a variety of mathematical concepts including algebra, statistics, logic, sets, probability, geometry, trigonometry and calculus. Students will be provided with opportunities to explore different ways of approaching a problem. Therefore, students will need to possess knowledge of basic mathematical concepts, be equipped with the skills needed to apply simple mathematical techniques correctly. Students will have two years to complete the IB requirements of an independent project and the IB Math Studies SL Exams. In accordance with the IB Syllabus, a TI-84+ graphing calculator is an essential tool for this course.

**Pre-AP Calculus AB / IB Math Studies SL**  
Course No.: 342  Grades Offered: 10-12  
Credit: 1.0  Examination: School Exam plus IB Internal and External Assessments  
Recommended Prerequisite: Algebra 2/Trig

The course content is designed to fulfill the requirements of the IB Math Studies program, as well as prepare students who are interested in taking AP Calculus-AB. Students will be required to complete an internal assessment, which is a statistics based project, as well as take the Math Studies SL exam to receive their IB certificate. There will be a wide range of topics covered that include statistics, functions, conic sections, trigonometry, and an introduction to calculus. It is recommended that students provide their own TI-83 or TI-84+ graphing calculator.

**ACT / SAT Mathematics Prep**  
Course No.: 329  Grades Offered: 10-12  
Credit: 0.25 (Alternate Days for a Semester)  
Examination: Ongoing Sample ACT/SAT Exams  
Recommended Prerequisite: Algebra 2/Trig

The ACT/SAT course is an introductory one. Students in this course will explore the typical types of questions found on the ACT/SAT tests: multiple choice questions, and short response questions. Students will receive instruction in each area, practice their skills and test strategies, and take actual ACT/SAT examinations. These courses will meet every other day for 20 weeks. ACT/SAT Mathematics Prep courses are also offered after school during the academic year and during the summer, but are not credit bearing. Students will have access to the Wilson-Prep on-line ACT/SAT program.

**Exploring Geometry / Trig**  
Course No.: 367  Grades Offered: 11-12  
Credit: 1.0  Examination: School Exam

This course covers topics in algebra, geometry, statistics, and trigonometry in order to prepare students for introductory college level mathematics. Students will be introduced to concepts of Algebra II, plane geometry, and descriptive statistics with an emphasis on applications to problem solving. Therefore, students will need to have successfully completed Algebra I prior to taking this course. Topics include simplification of radicals; identifying and evaluating functions; angle relationships; coordinate geometry; geometric probability; right triangle trigonometry; and systems of equations.

**College Algebra**  
Course No.: 368  Grades Offered: 12  
Credit: 1.0  Examination: School Exam

This is an introductory course in college mathematics. The focus of the course is to prepare students for a College Math placement exam. Topics include fluency with arithmetic without, linear equations, geometry of lines and circles, quadratic equations, functions, and radical expressions and equations.
**Mathematics and Computer Science**

**AP Calculus BC I / IB Math Studies SL**  
*Course No.: 345  Grades Offered: 10-12  Credit: 1.0  Examination: School Exam plus IB Internal Assessments  Recommended Prerequisite: Pre-Calculus*

This course is the first in a two year sequence preparing students for the AP Calculus BC exam, which is taken at the end of the second year. Topics covered in the first year are limits, differential calculus, and integral calculus. Applications including particle motion, mathematical modeling, and related rates give students critical insight into the importance of mathematics in the real world. Topics in IB Math Studies are also presented, in preparation for the IB Math Studies exam, which will be taken at the end of the first year. Those topics include logic, probability, set theory, and financial mathematics. It is highly recommended that students take Topics in Pre-calculus I and Topics in Pre-calculus II before taking this course.

**AP Calculus BC I and II / IB Math Studies SL Year 1**  
*Course meets for a period and one-half every other day.  Course No.: 356  Grades Offered: 11-12  Credit: 1.5  Examination: AP Calculus BC Exam plus IB Internal Assessments  Recommended Prerequisite: Pre-Calculus*

This course is designed for highly motivated students, who wish to successfully complete AP Calculus BC in the Spring of their junior year. Successfully completing AP Calculus BC in one year provides students with the opportunity to study Multivariable Calculus in senior year of High School. The fundamentals and mechanics of Calculus are presented from graphical, numerical, and analytical perspectives. Technology is employed to complete investigations, develop concepts, and illustrate examples. Students will also review and extend their knowledge of Algebra, Geometry, Trigonometry and Pre-Calculus. Furthermore, this class will also lead students to a certificate in IB math studies SL. It is the first year of a two year sequence in IB Math studies that prepares students for the IB math studies exam taken in their senior year. The course also meets for a double period every other day.

**AP Calculus BC II**  
*Course No.: 353  Grades Offered: 11-12  Credit: 1.0  Examination: AP Calculus BC  Recommended Prerequisite: AP Calculus BC I*

This course is the second in a two year sequence preparing students for the AP Calculus BC exam, which is taken at the end of the year. Topics include techniques of integration, parametric equations and applications to particle motion, polar equations, differential equations, infinite series and Taylor polynomials. It is highly recommended that students take AP Calculus BC I before taking this course.

**Probability and Statistics**  
*Course No.: 386  Grades Offered: 10-12  Credit: 1.0  Examination: School Exam  Recommended Prerequisite: Integrated Geometry*

This course designed for students who have an interest in probability and statistics and would like to continue into Advanced Placement Statistics the following year. Data collection, description, and analysis are studied as ways to report findings and build mathematical models for prediction and decision-making. This course is designed to help students build connections between statistics and the real world. Applications will include business, social science and health. An understanding and foundation in algebra is highly recommended. It is recommended that students provide their own TI-84 graphing calculator.

**AP Statistics**  
*Course No.: 363  Grades Offered: 11-12  Credit: 1.0  Examination: AP Statistics Exam  Recommended Prerequisite: Probability and Statistics and Algebra 2/Trig or Calc AB*

AP Statistics is a college level course that will introduce students to the major concepts and tools for collecting, assessing, synthesizing, evaluating, and drawing conclusions based on data from a variety of sources. A strong focus of this course is reading, writing and interpreting data. Students will work on activities to collect, explore and make inferences about real world data. It is essential that students have a TI-84+ graphing calculator.

**Multivariable Calculus / IB Math Studies SL Year 2**  
*Course No.: 355  Grades Offered: 12  Credit: 1.0  Examination: School Exam; IB Math Studies SL Exam  Recommended Prerequisite: AP Calculus BC Exam*

Multivariable Calculus is a course designed for students who wish to pursue Mathematics, Science or Engineering in college, as well as students who wish to take an advanced course in mathematics. This course covers the concepts of vectors, vector valued functions, functions of several variables, partial derivatives and multiple integration. Students will take the Math studies exam in the spring of the school year to complete the requirements for IB credit. As a result of taking this course, students will be eligible to earn course credit for college-level Calculus from Syracuse University’s Project Advance (SUPA). To receive credit from Syracuse, students will need to pay a fee and score a 4 or 5 on the AP Calculus BC exam.
Computer Science

Introduction to Computer Science (.5)

JAVA Computer Science (.5)

AP Computer Science A (1)

Computer Software Engineering (SUPA) (1)

INTRODUCTION TO COMPUTER SCIENCE
Course No.: 644 Grades Offered: 9-12 Credit: 0.5 Examination: School Exam

This course is designed to teach students to use computer programming as a method of problem solving. Students will learn how to write programs to solve a variety of problems using the visual basic programming language. A large emphasis is placed on analysis of problems and the development of effective algorithms and flowcharts. In addition, the course introduces programming concepts such as operators, decision statements, loops, functions, arrays and sub-procedures. Assignments will include simulations, games, and applications. Students are not required to have a background in computer programming.

JAVA COMPUTER SCIENCE
Course No.: 645 Grades Offered: 9-12 Credit: 0.5 Examination: School Exam

This course is an introduction to the JAVA programming language. It includes examples that demonstrate the syntax of the language in an object-oriented framework, along with standard programming practices such as defining instance methods, working with the built-in data types, creating user-defined data types, and working with reference variables.

AP COMPUTER SCIENCE A
Course No.: 646 Grades Offered: 10-12 Credit: 1.0 Examination: AP Computer Science Exam Recommended Prerequisite: Intro to Computers and JAVA

This course is a college-level programming course in Java. The course will emphasize program methodology, abstraction, and analysis. The course will contain the standard data structures including arrays, files, structures, and classes. Algorithmic design will include searching, sorting, and merging. Major programming projects will be required as well as the modifying and enhancing of existing large programs. This course prepares students for the AP Computer Science A. exam.

COMPUTER SOFTWARE ENGINEERING (SUPA)
Course No.: 652 Grades Offered: 11-12 Credit: 1.0 Examination: Final Project/Syracuse University Assessments and Final Recommended Prerequisite: Computer Science A

This course focuses on software design principles. The course covers the design of computer programs including top-down and object oriented design, analysis, testing, user interface, documentation, data structures, and graphic I/O. Applications are drawn from science and engineering, and programmed in C++. This course is a dual enrollment course through Syracuse University (SUPA). As a result of taking this course, students will be eligible to earn course credit for college-level Calculus from Syracuse University’s Project Advance. To receive credit from Syracuse, students will pay a fee.