

Mathematics

Vanessa Liveris, Department Chairperson - NVHS
 TBA, Department Chairperson - WVHS
 Jackie Palmquist – Department Chairperson - MVHS

The Mathematics curriculum is designed to meet the needs of all our students. The curriculum is structured into three distinct sequences based upon student abilities. Any six semesters of Mathematics, successfully completed, will fulfill the three year requirement for graduation.

All Math classes are year-long unless noted. Each course builds on the courses before it. The typical sequence includes some level of Algebra, Geometry, Algebra II/Trigonometry, Math Analysis, and Calculus.

Because Honors and Advanced Placement (AP) course work is accelerated and more sophisticated, upper level work of high quality in a compacted time frame is demanded of students. The Math Department has developed recommendations for student success. These criteria are indicators of performance levels or standards for the Honors or A.P. courses and are available from the Math Department.

Mathematics Course Listings

Sequence I - General			
Course #	Title	Level	Prerequisite
4651	Math 100	Yr. 9	Teacher recommendation
4652	Math 200	Yr. 10	Teacher recommendation
4653	Math 300	Yr. 11	Teacher recommendation
Sequence II - College Prep			
Course #	Title	Level	Prerequisite
4650	Algebra I-Block (2 periods)	Yr. 9, 10	Teacher recommendation
4612	Algebra I	Yr. 9, 10	Teacher recommendation
4620	Geometry Survey	Yr. 10-12	Teacher recommendation
4622	Geometry	Yr. 9-11	Teacher recommendation
4631	Algebra II/Trigonometry	Yr. 9-12	Teacher recommendation
4632	Algebra II	Yr. 11-12	Teacher recommendation
4634	Trigonometry	Sem.11-12	Teacher recommendation
4635	Probability & Statistics	Sem.11-12	Teacher recommendation
4642	Math Analysis	Yr. 10-12	Teacher recommendation
4670	Calculus	Yr. 11-12	Teacher recommendation
Sequence III - Accelerated College Prep			
Course #	Title	Level	Prerequisite
4624	Honors Geometry	Yr. 9-10	Teacher recommendation
4630	Honors Algebra II/Trig.	Yr. 9-11	Teacher recommendation
4636	AP Statistics	Yr. 10-12	Teacher recommendation
4644	Honors Math Analysis	Yr. 10-12	Teacher recommendation
4667	AP Computer Science I	Yr. 9-12	Teacher recommendation
4671	AP Calculus BC	Yr. 11-12	Teacher recommendation
4672	AP Calculus AB	Yr. 11-12	Teacher recommendation
4676	Calculus III	Yr. 12	Teacher recommendation

Mathematics Course Descriptions

All math courses are year long classes unless otherwise noted.

4651 Math 100 - Grade 9. Placement required. This course is designed to meet the needs of students who have experienced difficulty in learning mathematics in a traditional format. The content of this course develops basic arithmetic and computational skills using a variety of activities and group projects. This is the first course in a three course sequence. A TI-30X calculator (or equivalent) is required. This course is not NCAA approved for core.

4652 Math 200 - Grade 10. Prerequisite Math 100. This course stresses the applications of skills developed in Math 100. Practical applications used in everyday life situations will be emphasized. This course will cover pre-Algebra and some basic Geometry skills. Note-taking and study skills will be stressed. A TI-30X calculator (or equivalent) is required. This course is not NCAA approved for core.

4653 Math 300 - Grade 11. Prerequisite Math 200. Emphasis in this course is on basic Algebra skills including studying and graphing linear and quadratic equations and further exploring Geometry concepts developed from Math 200. An integration of Algebra and Geometry will be covered. Note-taking and study skills will be stressed. A TI-30X (or equivalent) calculator is required. This course is not NCAA approved for core.

4650 Algebra 1-Block – Grade 9, 10. Placement required. This is a one-year Algebra 1 course meeting in a two-period block of time every day. This course is designed for those students who struggled in pre-Algebra, needing more time to process and develop pre-Algebra skills. It is designed to cover Algebra 1 including solving and graphing linear and quadratic equations and inequalities in one and two unknowns. Students are introduced to exponential growth and decay concepts. There are activity-based units in this course. Note-taking and study skills will be stressed and formalized. Students will be scheduled for two periods of math and will receive two credits. One period will be for Algebra 1 credit and one period will be named math elective for one credit. The math elective will be a pass/fail grade. A graphing calculator is required.

4612 Algebra I – Grade 9, 10. Algebra I is a one-year course that develops numerical and graphing systems. Solving and graphing linear and quadratic equations and inequalities in one and two unknowns, and related polynomial functions are covered. Students are introduced to exponential growth and decay concepts. Note-taking and study skills are stressed and formalized. A graphing calculator is required.

4620 Geometry Survey - Grade 10-12. Placement required. Geometry Survey covers all the basic geometry concepts, using problem solving through inductive and deductive reasoning, but with little emphasis on formal proofs. The course includes topics such as distance concepts, angles, triangles, geometric inequalities, parallel and perpendicular lines and planes, polygons, circles and spatial figures and their properties. Right triangle trigonometry is introduced. A graphing calculator is required.

4622 Geometry - Grade 9-11. Emphasis is placed on problem solving and geometric proofs through inductive and deductive reasoning. The course includes topics such as geometry relative to the real number system, distance concepts, angles, triangles, geometric inequalities, parallel and perpendicular lines in space, planes, polygons and circles. Right triangle trigonometry is introduced. A graphing calculator is required.

4624 Honors Geometry - Grade 9-10. In addition to covering the topics listed above for Geometry (#4622), this course provides more rigorous and in-depth approach to covering geometric ideas and formal proofs. A graphing calculator is required.

***4630 Honors Algebra II / Trigonometry - Grade 9-11.** This course is more rigorous than 4631 Algebra II / Trigonometry. It covers the same topics, but more depth with some additions including sequences and series. Starting with a brief review of some basic axioms and properties in algebra, the course moves quickly to newer topics, integrating real-life applications. A summer packet of Algebra I problems may be required. A graphing calculator is required.

4631 Algebra II / Trigonometry - Grade 9-12. This course expands on concepts covered in Algebra I (4612), but develops a deeper understanding, while introducing more advanced algebra topics. Trigonometry topics will be studied beyond what was previously studied in Geometry. A graphing calculator is required.

4632 Algebra II - Grade 11-12. This course is devoted to providing an understanding of advanced algebra topics and expanding on the concepts of Algebra I (4612). If the student intends to take Math Analysis the following year, it is required that he or she takes Trigonometry during the summer. A graphing calculator is required.

4634 Trigonometry - *Grade 11-12. One semester. Prerequisite is Algebra II.* This is a one-semester course which emphasizes an understanding of the theoretical and practical concepts of trigonometry and their relationship to algebra. A graphing calculator is required.

4635 Probability and Statistics - *Grade 11-12. One semester. Prerequisite is Algebra II.* This is a semester course which emphasizes basic probability and statistical techniques. A graphing calculator is required.

***4636 AP (Advanced Placement) Statistics** - *Grade 10-12. Prerequisite is Algebra II/Trig or higher.* The Advanced Placement course in statistics introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students who successfully complete the course and AP examination may receive college credit and/or a higher placement in college. A summer reading assignment may be required. A TI-83 plus or a TI-84 plus graphing calculator is required. NOTE: A TI-89 is not equipped with a statistics package.

4642 Math Analysis - *Grade 10-12.* This one-year course serves as a prerequisite for Calculus. A major emphasis is on an extended study of various functions, analytic geometry, elementary logic, vectors, polynomials, transcendental functions and an introduction to limits. Trigonometric functions are utilized to solve real-world problems. A graphing calculator is required.

***4644 Honors Math Analysis** - *Grade 10-12.* This one year course is intended as the next sequential course after Honors Algebra II/Trigonometry and serves as the prerequisite for AP Calculus. In addition to those topics covered in Math Analysis, the student will study polynomial and transcendental functions, polar coordinates, vectors and limits. A graphing calculator is required.

4667 AP (Advanced Placement) Computer Science I - *Grade 9-12. Prerequisite is Geometry.* This one-year introductory course emphasizes structured computer programming using Visual Basic Net. Programming is emphasized as a tool to develop problem solving, encourage student creativity, and facilitate discovery learning. Students who successfully complete this course and the AP Computer Science A examination may receive college credit and/or a higher placement for a college course.

4670 Calculus - *Grade 11-12.* This calculus course reviews Math Analysis concepts and introduces a study of limits, derivatives, integrals, and functions including trigonometric, exponential, and logarithmic functions. A graphing calculator is required.

***4671 AP (Advanced Placement) Calculus BC** - *Grade 11-12. Prerequisite is Honors Math Analysis.* Topics covered will include an in- depth study of a variety of functions and a study of limits. In addition, differential and integral calculus with applications in related rates, area and volume will be covered. Further studies include sequences and series, elementary differential equations and proofs of theorems. This course demands analytical reasoning skills and disciplined study habits appropriate for continued success at the college level. Extensive independent study is required. Students who successfully complete the course and AP examination may receive credit and/or a higher placement in a college Calculus class. A completed summer assignment packet is required on the first day of class. A graphing calculator is required. This course is the equivalent of the traditional college level Calculus I & II courses.

***4672 AP (Advanced Placement) Calculus AB** - *Grade 11-12. Prerequisite is Math Analysis.* This course is similar to Calculus BC, with less emphasis on rigorous proofs and excludes some topics. The goal of this class is preparation for the AP Calculus AB Exam for college credit. The demands of this course are similar to Calculus BC and involve analytical reasoning skills and disciplined study habits. Students who successfully complete the course and Calc AB AP examination may receive credit and/or a higher placement in a college Calculus class. Some independent study is required. A completed summer assignment packet is required on the first day of class. A graphing calculator is required. This course is the equivalent of the traditional college level Calculus I course.

4676 Calculus III - (Math 241 – 4 sem. hours @ University of Illinois) Calculus of Several Variables - *Grade 12. Prerequisite is BC Calculus and a 4 or higher on the AP exam. Contact the department for further explanation.* This course is the third course in Calculus and Analytic Geometry. Topics include three-dimensional space, functions of several variables, partial derivatives and multiple integrals. This course uses Mathematica software. **Qualifications on:** <http://netmath.math.uiuc.edu/whoqual.html>

- These courses may have obligations that require time outside of class period.