

The Mathematics Department offers courses designed as foundations for college, vocational, and everyday use. Emphasis is on development of logical thinking, mathematical skills, and applications. To fulfill graduation requirements, all students will be required to pass six semesters of Mathematics through Algebra 2 in grades 9-12.



Intermediate Algebra

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: Algebra 1 (8th grade)

Year-long course

This course fulfills the Math requirement for graduation.

Course Description: This course is the study of linear and non-linear functions, probability, and statistics.

The primary units of study include solving and graphing linear equations and systems of linear equations, quadratics, exponents and exponential functions, polynomials and factoring, radicals, and rational functions.

Students will demonstrate learning through unit exams and a semester final.

Board Approved Primary Resource:

McDougal Littell Algebra 1

Ron Larson - McDougal Littell – 2007 – Print

ISBN: 9780618594023

Additional Registration Information: Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI 30 or higher. A limited number of calculators will be available for students to check out for the entire year.



Geometry

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: Algebra 1 (Grade 8) and Intermediate Algebra

Year-long course

This course fulfills the Math requirement for graduation.

Course Description: This course is the study of the analysis of plane, solid, and coordinate geometry as they relate to both abstract mathematical concepts as well as real-world problem situations.

The primary units of study include congruence and similarity, properties of lines, triangles, quadrilaterals, circles, length, perimeter, area, circumference, surface area, and volume.

The students will demonstrate learning through unit tests and cumulative semester exams.

Board Approved Primary Resource:

Ron Larson - McDougal Littell – 2007 – Print

ISBN: 9780618595402

Additional Registration Information: Because of students' desires to complete homework assignments in the evening, students benefit from having a scientific calculator TI 30 or higher. A limited number of calculators will be available for students to check out for the entire year.



Geometry Design and Engineering

Grades: 9-10

Instructional Delivery: Face-to-face

Prerequisite: Intermediate Algebra

Location: LNHS

Year-long, two period course

This course fulfills the Math, Arts or elective requirement for graduation for the Class of 2020, 2021, and 2022.

This course fulfills the Math or elective requirement for graduation for the Class of 2023.

Course Description: This course is the study of geometry concepts, such as analysis of plane, solid, and coordinate geometry, as they relate to design. Using geometric concepts, 3-D printers, laser cutters/etchers & CNC Benchtop Milling Machines students will create innovative prototypes and 3-D masterpieces.

The primary geometry units of study (congruence and similarity, properties of lines, triangles, quadrilaterals, circles, length, perimeter, area, circumference, surface area, and volume) will be supported through applications of Computer-Aided Design (CAD) software, standards of representation, problem-solving models and engineering design process.

Students will demonstrate learning through the use of 3-D printers, laser cutters/etchers and CNC Benchtop Milling Machines. Students will create innovative prototypes and 3-D masterpieces by producing designs and constructing projects. Students will further demonstrate learning through unit tests and cumulative semester exams.

Board Approved Primary Resource:

Ron Larson - McDougal Littell – 2007 – Print

ISBN: 9780618595402

Mechanical Drawing: Board & CAD Techniques

Jay D Helsel-Glencoe/McGraw-Hill-2003-Print

ISBN: 9780078251009

Basic Technical Drawing

Henry Ceceil Spewncer - John T Dygdon - James E Novak - Glencoe

McGraw-Hill -2004 -Print

ISBN: 9780078457487

Course Recommendation: This course is recommended for students who prefer hands-on, collaborative learning and who want to learn more about applying their knowledge to real-world projects.

Additional Registration Information: This course is two-period, blocked course co-taught with a Geometry and a Career & Technical Education teacher. Colleges and universities may or may not accept this course as an Arts credit. A fee will be assessed for any projects taken home. Students may purchase higher quality materials than offered as part of the course. Because of students' desires to complete homework assignments in the evening, students benefit from having a scientific calculator TI 30 or higher. A limited number of calculators will be available for students to check out for the entire year. LSHS students provide their own transportation.



Honors Geometry

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: *Honors Algebra 1* (Grade 8) or *Intermediate Algebra* and instructor recommendation

Year-long course

This course fulfills the Math requirement for graduation.

Course Description: This course is the study of the analysis of plane, solid, and coordinate geometry as they relate to both abstract mathematical concepts as well as real-world problem situations.

The primary units of study include congruence and similarity, properties of lines, triangles, quadrilaterals, circles, length, perimeter, area, circumference, surface area, and volume.

The students will demonstrate learning through unit tests and cumulative semester exams.

Board Approved Primary Resource:

Geometry

Ron Larson - McDougal Littell – 2007 – Print

ISBN: 9780618595402

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year.

Algebra 2

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: Geometry

Year-long course

This course fulfills the Math requirement for graduation.

Course Description: This course is the study of families of functions including linear and nonlinear functions, and data analysis.

The primary units of study include linear functions, inequalities, systems, quadratic functions, cubic functions, rational functions, radical functions, logarithmic functions, trigonometric functions, measures of central tendency and dispersion, probability and statistics.

The students will demonstrate learning through chapter tests and a cumulative semester final.

Board Approved Primary Resource:

Algebra 2 Ron Larson - McDougal Littell – 2007 – Print ISBN: 9780618595419

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year.



Honors Algebra 2

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: Geometry and *Honors* Algebra 1 (8th grade) or instructor recommendation.

Year-long course

This course fulfills the Math requirement for graduation.

Course Description: This course is the study of families of functions including linear and nonlinear functions, and data analysis.

The primary units of study include linear functions, inequalities, systems, quadratic functions, cubic functions, rational functions, radical functions, logarithmic functions, trigonometric functions, measures of central tendency and dispersion, probability and statistics.

The students will demonstrate learning through chapter tests and a cumulative semester final.

Board Approved Primary Resource:

Algebra 2 Ron Larson - McDougal Littell – 2007 – Print ISBN: 9780618595419

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year.



College Algebra and Trigonometry

Grade: 11-12

Instructional Delivery: Face-to-face

Prerequisite: Algebra 2

Year-long course

This course fulfills the Math or elective requirement for Graduation.

Course Description: This course is designed for students who have completed Algebra 2 but require another year of mathematics to prepare for pre-calculus or college level math courses. This class will contain an overview of the fundamental concepts in algebra and trigonometry as well as some statistics.

The primary units of study include: analyzing linear, quadratic, polynomial, logarithmic, rational, piecewise, absolute value, exponential, radical and trigonometric functions; transformations and inverses of functions; solving systems of equations; apply counting principles to calculate probabilities and interpret outcomes; analyze arithmetic and geometric sequences and series.

Students will demonstrate learning through quizzes, tests and cumulative semester finals.

Course Recommendation: This course is recommended for students who are interested in continuing beyond Algebra 2 to prepare them for college. This course will help students when taking math placement tests for post-secondary and may eliminate the need for remedial courses in college.

Board Approved Primary Resource:

Algebra and Trigonometry for College Readiness

Lial and Hornsby- Pearson Education 2011- Addison Wesley Print and online

ISBN: 9780131369030

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year.

Pre-Calculus

Grades: 10-12

Instructional Delivery: Face-to-face or hybrid

Prerequisite: Algebra 2

Year-long course

This course fulfills the Math or elective requirement for graduation.

Course Description: This course is the study of functions, series, limits and other concepts as an introduction to calculus.

The primary units of study include trigonometric, exponential, logarithmic, quadratic and rational functions in addition to series, sequences, limits and an introduction to differential and integral calculus.

The students will demonstrate learning through formative and summative exams, including unit tests and semester final exams.

Course Recommendation: This course is recommended for students who are interested in continuing their study of mathematics, those who may be interested in taking calculus, and as preparation for college level mathematics courses.

Board Approved Primary Resource:

Pre-calculus with Limits: A Graphing Approach

Ron Larson - Robert P. Hostetler - Bruce H. Edwards - David C. Falvo - Houghton Mifflin – 2005 – Print

ISBN: 9780618394784

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year. The hybrid course is offered at LSHS only. LNHS students provide their own transportation.



College Now Pre-Calculus (LSHS)

Grade: 12

Instructional Delivery: Face-to-Face

Prerequisite: Algebra 2 & 3.0 cumulative GPA

Year-long course

This course fulfills the elective requirement for graduation

Course Description: This course is the study of functions, series, limits and other concepts as an introduction to calculus.

The primary units of study include trigonometric, exponential, logarithmic, quadratic and rational functions in addition to series, sequences, systems of equations, limits and an introduction to differential and integral calculus.

The students will demonstrate learning through formative and summative exams, including unit tests and semester final exams.

Course Recommendations: This course is recommended for students who are interested in continuing their study of mathematics, those who may be interested in taking calculus, and as preparation for college level mathematics courses. Students who earn a B- or better in Algebra 2 are generally successful.

Additional Registration Information: A student earning a passing grade in semester 1 and 2 of the course is eligible for 5 Southwest Minnesota State University Credits from the College Now concurrent enrollment program. The course is offered at LSHS only. LNHS students provide their own transportation.



Honors Pre-Calculus

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: *Honors Algebra 2* or *Algebra 2* and instructor recommendation

Year-long course

This course fulfills the Math or elective requirement for graduation.

Course Description: This course is the study of functions, series, limits and other concepts as an introduction to calculus.

The primary units of study include trigonometric, exponential, logarithmic, quadratic and rational functions in addition to series, sequences, limits and an introduction to differential and integral calculus.

The students will demonstrate learning through formative and summative exams, including unit tests and semester final exams.

Course Recommendation: This course is recommended for accelerated students (in grades 9-11) who are interested in continuing their study of mathematics, those who may be interested in taking calculus, and as preparation for college level mathematics courses. In this honors course, topics are covered at an accelerated pace and in greater depth than pre-calculus.

Board Approved Primary Resource:

Pre-calculus with Limits: A Graphing Approach

Ron Larson - Robert P. Hostetler - Bruce H. Edwards - David C. Falvo - Houghton Mifflin – 2005 – Print ISBN: 9780618394784

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year.



Advanced Placement Calculus AB

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: Pre-Calculus

Year-long course

This course fulfills the Math or elective requirement for graduation.

The Advanced Placement program (AP) provides high school students with the opportunity to take college-level coursework and exams while still in high school, with each course culminating in a rigorous, optional exam to earn potential college credit. AP provides motivated and academically prepared students with the opportunity to develop the study skills, habits of mind, and critical thinking skills that they will need in college.

Course Description: This course is the study of how things change and accumulate while providing a framework which scientists, engineers and economists use for modeling dynamic systems in order to make predictions and calculate summations within those systems.

The primary units of study include limits and their properties, differentiation, integration, The Fundamental Theorem of Calculus, differential equations, and slope fields.

The students will demonstrate learning through quizzes, tests and voluntary participation in the AP Calculus AB test in May.

Board Approved Primary Resource:

Calculus of a Single Variable

Ron Larson - Robert P. Hostetler - Bruce H. Edwards - Houghton Mifflin Co. – 2006 – Print

ISBN: 9780618503049

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year.

Advanced Placement Statistics

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: Algebra 2

Year-long credit

This course fulfills the Math or elective requirement for graduation.

The Advanced Placement program (AP) provides high school students with the opportunity to take college-level course work and exams while still in high school, with each course culminating in a rigorous, optional exam to earn potential college credit. AP provides motivated and academically prepared students with the opportunity to develop the study skills, habits of mind, and critical thinking skills that they will need in college.

Course Description: This course is the study of collecting, analyzing, and drawing conclusions from data.

The primary units of study include exploring data by observing patterns and departures from patterns, planning a study by deciding what and how to measure, anticipating patterns by producing models using probability and simulations, and using statistical inference by confirming models.

The students will demonstrate learning through quizzes, labs, tests and the AP Statistics test in May.

Board Approved Primary Resource:

The Practice of Statistics, 2nd edition

Daniel S. Yates - David S. Moore - Daren S. Starnes - W.H. Freeman – 2008 – Print

ISBN: 9780716773092

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year. Calculators are allowed on the entire AP exam. Summer homework may be required.



Advanced Placement Calculus BC and Advanced Topics

Grades: 9-12

Instructional Delivery: Face-to-face

Prerequisite: Advanced Placement Calculus AB

Year-long credit

This course fulfills an elective requirement for graduation.

The Advanced Placement program (AP) provides high school students with the opportunity to take college-level coursework and exams while still in high school, with each course culminating in a rigorous, optional exam to earn

potential college credit. AP provides motivated and academically prepared students with the opportunity to develop the study skills, habits of mind, and critical thinking skills that they will need in college.

Course Description: This course is the continued study of calculus concepts including those found on the AP Calculus BC exam and an introduction to multivariable calculus.

The primary units of study include advanced applications and techniques of integration, convergence and divergence of infinite sequences and series, extending properties of calculus such as differentiation and integration to a broader variety of functions and relations including conic sections, parametric equations, vector-valued functions, the polar coordinate system, and functions with multiple variables.

The students will demonstrate learning through quizzes, tests and voluntary participation in the AP Calculus BC test in May.

Board Approved Primary Resource:

Calculus of a Single Variable

Ron Larson - Robert P. Hostetler - Bruce H. Edwards - Houghton Mifflin Co. – 2006 – Print

ISBN: 9780618503049

Additional Registration Information: Operating a graphing calculator is an integral part of this course. Because of students' desires to complete homework assignments in the evening, students benefit from having a calculator equivalent to a TI-83+ or TI-84. A limited number of calculators will be available for students to check out for the entire year.