MATHEMATICS DEPARTMENT COURSE DESCRIPTIONS

Link to Standards - Measure used to ensure completion of course objectives.

Course Title	Credit	Grade Level				Prerequisite
		9	10	11	12	
Algebra I (year long)	1	■				Placement
Algebra I N	1	■				
Intermediate Algebra	1			■	■	Geometry & Placement
Algebra II N	1	■	■	■	■	Geometry & Algebra I
Honors Algebra II N	1		■	■	■	Honors Geometry or Teacher Approval
Geometry N	1	■	■	■	■	Algebra I
Geometry Plus+	0.5 elective		■	■	■	Placement
Honors Geometry N	1	■	■	■	■	Algebra I
Probability and Statistics N	1			■	■	Algebra II, Intermediate Algebra, or Honors Algebra II
Statistics AMT:156 N*	0.5 and 3 dual credit hours w/SCC			■	■	Algebra II or Honors Algebra II and SCC enrollment
Pre-Calculus N	1		■	■	■	Algebra II or Honors Algebra II
AP Pre-Calculus N	1		■	■	■	Honors Alg II or Teacher Approval
Calculus MAT:210 N	1 and 4 hours dual credit at SCC			■	■	AP Pre-Calculus and SCC enrollment
Calculus II MAT:216 N	1 and 4 hours dual credit at SCC			■	■	Calculus MAT:210 and SCC enrollment
Math for the Liberal Arts MAT:110	0.5 and 3 hours dual credit at SCC			■	■	Algebra II or Honors Algebra II and SCC enrollment

N - NCAA approved courses

* Dual Credit - Students enrolling in these courses must meet the requirements to enroll in a dual credit course.

Mathematical Practice Standards:

The students will:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.

5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Course Name	Algebra I (year long)
Course Number	201311
Grade	9
Credit	1 Math Credit, 1 elective credit
Length	4 Terms
Prerequisite	Placement

Course Description:

Algebra I aims to deepen and extend student understanding built in previous courses by focusing on developing fluency with solving linear equations and inequalities and systems; extending these skills to solving quadratic and exponential functions; exploring functions, graphically, numerically, symbolically and verbally; and using regression techniques to analyze the fit of models to distributions of data. On a daily basis, students in Algebra 1 use problem solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments justifying their thinking. Students learn in collaboration with others, sharing information, expertise, and ideas. The course is well balanced between procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (extension and transference). The lessons in the course meet all of the content standards of the Common Core State Standards for Mathematics and embed the CCSS Standards for Mathematical Practice as an integral part of the lessons in the course.

This class will meet all year long with the idea that Algebra I + is built in to also be able to cover prerequisite skills. We will use the extra time to supplement learning from grades 6-8.

Course Name	ALGEBRA I
Course Number	203111
Grade	9 - 12
Credit	1 Credit
Length	2 Terms
Prerequisite	8th Grade Math

Course Description:

Algebra I aims to deepen and extend student understanding built in previous courses by focusing on developing fluency with solving linear equations and inequalities and systems; extending these skills to solving quadratic and exponential functions; exploring functions, including sequences, graphically, numerically, symbolically and verbally; and using regression techniques to analyze the fit of models to distributions of data. On a daily basis, students in Algebra 1 use problem solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments justifying their thinking. Students learn in collaboration with others, sharing information, expertise, and ideas. The course is well balanced between procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (extension and transference). The lessons in the course meet all of the content standards of the Common Core State Standards for Mathematics and embed the CCSS Standards for Mathematical Practice as an integral part of the lessons in the course.

Course Name	INTERMEDIATE ALGEBRA
Course Number	203451/203452
Grade	11 - 12
Credit	1 Credit
Length	2 Terms
Prerequisite	Geometry & Placement

Course Description:

Intermediate Algebra is designed to help students solidify their understanding of Algebra I and Geometry in preparation for Algebra II by providing a different kind of experience. This experience consists of modeling real-world applications with a functions approach that will give them a deeper grasp of the necessary concepts. Topics will include proportional relationships, solving equations and inequalities, functions and their representations, linear models from data, as well as exponential and quadratic functions and financial literacy.

Students are encouraged to take Algebra II after this course, even if they have earned 3 math credits toward gradua in order for students
to engage with all of the Iowa Core math standards required in high school. Algebra II is often required for colleg admissions.

Course Name ALGEBRA II
Course Number 204111

Grade 10 - 12
Credit 1 Credit
Length 2 Terms
Prerequisite Algebra I and Geometry
Course Description:

Algebra II aims to apply and extend what students have learned in previous courses by focusing on finding connections between multiple representations of functions, transformations of different function families, finding zeros of polynomials and connecting them to graphs and equations of polynomials, modeling periodic phenomena with trigonometry, applying fundamentals of sequences and series to model problems, solving various types of equations, and understanding the role of randomness and the normal distribution in making statistical conclusions. On a daily basis, students in Algebra II use problem solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating arguments to justify their thinking. Students learn in collaboration with others by sharing information, expertise, and ideas. The course is based on the content standards of the Common Core State Standards for Mathematics and embeds the CCSS Standards for Mathematical Practice as an integral part of the lessons in the course.

Course Name HONORS ALGEBRA II
Course Number 204121

Grade 9 - 12
Credit 1 Credit
Length 2 Terms
Prerequisite Honors Geometry or Teacher Recommendation
Course Description:

Honors Algebra II aims to apply and extend what students have learned in previous courses by focusing on finding connections between multiple representations of functions, transformations of different function families, finding zeros of polynomials and connecting them to graphs and equations of polynomials, modeling periodic phenomena with trigonometry, simplifying expressions, solving various types of equations, applying matrix operations to model and solve situations, and extending graphing to a three-dimensional coordinate system. On a daily basis, students in Honors Algebra II use problem solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments to justify their thinking. Students learn in collaboration with others by sharing information, expertise, and ideas. A main focus of this course is to provide students with the necessary rigorous mathematical content that will prepare them for AP Pre-Calculus and AP Calculus.

Course Name GEOMETRY
Course Number 203411

Grade 9 - 12
Credit 1 Credit
Length 2 Terms
Prerequisite Algebra I
Course Description:

Geometry students will construct geometric shapes and figures, perform transformations on the coordinate plane, discover relationships between angles and lines, trig ratios and Pythagorean Theorem to solve problems in context, proof writing determining congruent and similar triangles, calculating surface area and volume, and independence in probability. Students will focus on understanding why relationships exist and to discover each through activities in class. We will explore logic and proof, enhancing deductive reasoning. The focus of the course is to provide students with a stronger foundation in mathematics, but to also challenge them to improve critical thinking and problem solving skills for better preparation for future courses taken.

Course Name GEOMETRY (year long)
Course Number 203410

Grade 9-12
Credit 1 Math credit, 1 elective credit
Length 4 terms
Prerequisite Algebra I
Course Description:

Geometry students will construct geometric shapes and figures, perform transformations on the coordinate plane, discover relationships between angles and lines, trig ratios and Pythagorean Theorem to solve problems in context, proof writing determining congruent and similar triangles, calculating surface area and volume, and independence in probability. Students will focus on understanding why relationships exist and to discover each through activities in class. We will explore logic and proof, enhancing deductive reasoning. The focus of the course is to provide students with a stronger foundation in mathematics, but to also challenge them to improve critical thinking and problem solving skills for better preparation for future courses taken. We will use the extra time to do supplement learning from grade 6-8.

Course Name HONORS GEOMETRY
Course Number 203421

Grade 9 - 12
Credit 1 Credit
Length 2 Terms
Prerequisite Algebra I
Course Description:

Geometry students will construct geometric shapes and figures, perform transformations on the coordinate plane, discover relationships between angles and lines, trig ratios and Pythagorean Theorem to solve problems in context, proof writing determining congruent and similar triangles, calculating surface area and volume, and independence in probability. Students will focus on understanding why relationships exist and to discover each through activities in class. We will explore logic and proof, enhancing deductive reasoning. The focus of the course is to provide students with a stronger foundation in mathematics, but to also challenge them to improve critical thinking and problem solving skills for better preparation for future courses taken. In addition, the course will include more demanding trigonometry calculations, and advanced relationships in shapes and modeling.

Course Name PROBABILITY AND STATISTICS
Course Number 206311

Grade 11 - 12
Credit 1 Credit
Length 2 Terms
Prerequisite Algebra II or Honors Algebra II
Course Description:

Statistical analysis of data is used in areas ranging from opinion polls to engineering, from education and psychology studies, to marketing and advertising. Statistics is the study of the collection, organization, presentation and interpretation of numerical data. Probability is the study of chance and how to quantify or measure uncertainty. In Probability and Statistics, the students will learn to collect a data sample, estimate what the sample says about the population as a whole, and make decisions based on their analysis.

Course Name	STATISTICS MAT:156
Course Number	206321
EICC	3 CREDITS
Grade	11 - 12
Credit	0.5 Credit
Length	2 Terms
Prerequisite	Algebra II or Honors Algebra II with C or Higher grade and ACT/ALEKS Score Requirement - ACT math score of 22+ or ALEKS score of 30+ with teacher recommendation

Course Description:

Statistics is an introductory college-level statistics course that introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students cultivate their understanding of statistics using technology, investigations, problem solving, and writing as they explore concepts like variation and distribution; patterns and uncertainty; and data-based predictions, decisions, and conclusions.

Course Name	PRE-CALCULUS
Course Number	205321
Grade	10 - 12
Credit	1 Credit
Length	2 Terms
Prerequisite	Algebra II or Honors Algebra II

Course Description:

This course strengthens and extends concepts learned in previous algebra courses. It is intended for students who desire a high level math course without an emphasis on analytic proof or limit theory. The vocabulary of relations and functions is related to different types of functions throughout the course. In the study of trigonometry, students build on their trigonometric knowledge focusing on their graphs, the proofs of trigonometric identities and the solutions using the laws of sines and the law of cosines.

Course Name	AP PRECALCULUS
Course Number	205311
Grade	10 - 12
Credit	1 Credit
Length	2 Terms
Prerequisite	Honors Algebra II or Teacher Recommendation

Course Description:

AP precalculus centers on functions modeling dynamic phenomena. This research-based exploration of functions is designed to better prepare students for college-level calculus and provide grounding for other mathematics and science courses. In this course, students study a broad spectrum of function types that are foundational for careers in mathematics, physics, biology, health science, business, social science, and data science. Throughout this course, students develop and hone symbolic manipulation skills, including solving equations and manipulating expressions, for the many function types throughout the course. Students also learn that functions and their compositions, inverses, and transformations are understood through graphical, numerical, analytical, and verbal representations, which reveal different attributes of the functions and are useful for solving problems in mathematical and applied contexts. Students will develop models to interpolate, extrapolate, and interpret information with different degrees of accuracy for a given context or data set. As a result of examining functions from many perspectives, students develop a conceptual understanding not only of specific function types, but also of functions in general. This helps students engage with both familiar and novel contexts.

Course Name	MAT:210 Calculus 1
Course Number	205811/205812
EICC	4 CREDITS
Grade	11 - 12
Credit	1 Credit
Length	2 Terms
Prerequisite	AP Precalculus with C or Higher grade and ACT/ALEKS Score Requirement, (ACT math score of 27+ or ALEKS score of 76+) or AP precalculus exam score of 3+

Course Description:

MAT210: Calculus I will be offered during the fall semester each year. The course consists of two terms of work in calculus and related topics comparable to courses in colleges and universities. Topics include limits and continuity of functions, derivatives and integrals. Graphing calculators will be extensively used throughout the study of Calculus, both for the ability to graphically determine information about a function and for the numeric techniques for finding approximate results, which will also be studied. Two forms of an Advanced Placement Exam in late spring offer the students the opportunity to earn up to two semesters of college credit at most colleges and universities. This course prepares students for the Calculus AB form. For the Calculus BC form, students should plan to take this course followed by MAT216: Calculus II. The decision about AP credit is up to the individual college, so contacting colleges of interest is recommended when deciding whether to take an AP test.

Course Name	MAT:216 Calculus II
Course Number	205911/205912
EICC	4 CREDITS
Grade	11 - 12
Credit	1 Credit
Length	2 Terms
Prerequisite	MAT:210 - Calculus I

Course Description:

MAT:216 - Calculus II will be offered during the spring semester each year. The course continues the study of Calculus begun in MAT:216 - Calculus II. Topics extend the work with limits, derivatives, and integrals to functions written in polar and vector forms and functions represented parametrically. Sequence and Series notation learned in Precalculus will be extended to series with an infinite number of terms, and applied to the Power Series representations of functions and the subsequent ability to work with derivatives and integrals for functions that had no simple algebraic form. Students completing this course will hopefully choose the Calculus BC form of the Advanced Placement test to earn two semesters of college credit at most colleges and universities. The College Board also gives an AB score to those choosing this form so that colleges can distinguish students with strong results in the first semester topics.

Course Name	MATH FOR THE LIBERAL ARTS MAT: 110
Course Number	204810/204811
EICC	3 CREDITS
Grade	11-12
Credit	0.5 Credit
Length	1 Term
Prerequisite	Algebra II or Honors Algebra II with C or Higher grade and ACT/ALEKS Score Requirement, ACT math score of 22+ or ALEKS score of 30+

Course Description:

This course is designed for the liberal arts student. The course will include units on logic, problem-solving, sets, counting methods and probability, statistics, financial mathematics, and different base systems. The following topics may be included, number theory, social choice and decision making, applications of logarithms, applications of mathematics in the arts, and geometry. *This course satisfies a general education requirement in the Mathematics Area.*

Prerequisite(s): A minimum grade of C- in **MAT 065 or MAT 066** or minimum math placement score based on college assessment within the last two years. Immediate prerequisite courses must have been completed within the last two years.