# MAT Mathematics

### Courses

**MAT.080 Basic Mathematics W/Geometry**  
4 4 4

This course is designed for the student who is in need of proficiency in basic arithmetic processes with integrated geometry. Topics to be covered in this course include: basic operations and problem solving with whole numbers, fractions, and decimals; ratio, rate and proportion; percent; geometry and measurement; statistics real number system; and basic algebraic concepts. This course will require the use of an online computer assisted program both in and outside of class time. Offered: Fall or Spring or Summer  
Prerequisites: The appropriate placement exam score and a high school diploma or equivalent. Applicable toward graduation at Sandburg where program structure permits; Not applicable. General Education – Not Applicable

**MAT.083 Beginning Algebra W Geometry**  
4 4 4

This course is designed as an introductory algebra course with integrated geometry. Topics to be covered in this course include: real number system; simplifying and evaluating algebraic expressions; solving linear equations and inequalities; graphing linear equations and inequalities; solving systems of linear equations; introduction to function; exponents; roots; polynomials; and factoring techniques. This course will require the use of an online computer assisted program both in and outside of class time. Offered fall or spring or summer The appropriate placement exam scores or MAT.080 with a grade of C or better. Offered: Fall or Spring or Summer  
Prerequisites: The appropriate placement exam scores or MAT.080 with a grade of C or better. Applicable toward graduation at Sandburg where program structure permits: Not applicable. General Education – Not Applicable

**MAT.085 College Math Fundamentals**  
4 4 4

This is a preparatory course to equip students for college-level general education mathematics and statistics courses. The content of the course is relevant for non-STEM majors. Topics in this course incorporate real-life applications while teaching fractions, decimals, percent; algebraic concepts; geometry & measurement; and an introduction to probability and statistics. IAI Course No.: N/A  
Offered: Fall, Spring & Summer  
Prerequisites: Take MAT.080 with a minimum grade of C or better. Applicable toward graduation at CSC where program structure permits: Degree or Certificate: N/A General Education: N/A. General Education – Not Applicable

**MAT.086 Math Literacy**  
6 6

Math Literacy is a preparatory course for college-level general education mathematics and statistics courses that includes content that is relevant for non-STEM majors. Topics in this course are presented in context and focus on numeracy, functions, and modeling. In addition to algebra topics, this course promotes data literacy and incorporates reading, writing and technology. Students will be required to participate in group work and use an online computer assisted program outside of classroom time. Offered: Fall or Spring or Summer  
Prerequisites: The appropriate placement exam score or MAT.080 or MAT.090 with a grade of C or better is required to enroll in this course. Applicable toward graduation at Sandburg where program structure permits: Not applicable. General Education – Not Applicable

**MAT.089 Concepts of Math Fundamentals**  
1 1

This course is to be taken concurrently with MAT.109. Math skills which are necessary for a student to successfully complete the general education math course will be covered. Emphasis will be on number theory and estimation; basic operations; ratios, proportions, and percent; geometric and measurement concepts; algebraic expressions, equations, and formulas; and study skills for math. Other topics may be visited, as needed, to be successful in a liberal arts math course. Offered: Fall, Spring & Summer  
Prerequisites: The appropriate placement exam scores or MAT.080 with a grade of C or better. Offered: Fall or Spring or Summer  
Prerequisites: The appropriate placement exam scores or MAT.080 with a grade of C or better. Applicable toward graduation at CSC where program structure permits: Degree or Certificate: N/A General Education: N/A. General Education – Not Applicable

**MAT.090 Arithmetic Fundamentals**  
3 1-3

This is a basic foundation course in computational mathematics offered for students whose current skills in elementary arithmetic need improvement. The specific topics included are fractions and decimals; percentages, proportions, and ratios; metric and English measurements; and the fundamentals of integer arithmetic and elementary algebraic operations. This course serves as a basis for students who plan to study business mathematics, algebra, or technical mathematics. This course may be repeated three times (four total) by students needing additional help. Both self-paced and lecture sections are available. Offered: Fall or Spring or Summer  
Prerequisites: High school graduation or GED equivalency. Applicable toward graduation at Sandburg where program structure permits: Degree or Certificate: N/A General Education: N/A. General Education – Not Applicable
**MAT.093 Fundamentals of Algebra**  
3 1-3

This course is designed for students who have not had algebra in high school or who need a review of basic algebraic concepts. Topics covered in this course include properties of integers, real, and rational numbers; polynomials; and rational and quadratic expressions. Techniques for solving problems involving these types of expressions are also covered. This course may be repeated three times (four total) by students needing additional help.  
Offered: Fall or Spring or Summer  
Prerequisites: The appropriate placement exam score or completion of MAT.090 with a grade of C or better  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: Not Applicable.  
General Education – Not Applicable

**MAT.095 Geometry and Trigonometry Review**  
3 1-3

This course is intended for persons who did not take geometry or trigonometry in high school as well as those who did take those subjects but now need a review. While it may not be a required prerequisite for other courses, it is very helpful for students planning to take the technical math series. The topics covered include angles, triangles and quadrilaterals; basic geometric measures and properties; the circle and solid geometric figures; the number and changing between degrees and radians; tangent of an angle; the sine and cosine of an angle; the Pythagorean theorem; and solving application problems involving right triangles. This course may be repeated three times (four total) by students needing additional help.  
Offered: Fall or Spring or Summer  
Prerequisites: MAT.093 with a grade of C or better  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: Not Applicable.  
General Education – Not Applicable

**MAT.096 Arithmetic Fundamentals**  
3 1-3

This is a basic foundation course in computational mathematics offered for students whose current skills in elementary arithmetic need improvement. The specific topics included are fractions and decimals, percentages, proportions, and ratios; metric and English measurements, and the fundamentals of integer arithmetic and elementary algebraic operations. This course serves as a basis for students who plan to study business mathematics, algebra, or technical mathematics. This course may be repeated three times (four total) by students needing additional help. This course is recommended for students who score below 12.9 on the numerical skills section of the TABE test. Student is required to have a High School Diploma or GED equivalency.  
Offered: Spring  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: Not Applicable.  
General Education – Not Applicable

**MAT.097 Geometry**  
3 3

This course will introduce students to undefined terms, axioms and postulates, and theorems. Specific topics include plane and solid geometry, properties of congruence, similarity, ratio and proportion, area, perimeter, and volume of basic figures. Constructions and the writing of inductive, deductive, and indirect proofs will be included.  
Offered: As Needed  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: Not Applicable.  
General Education – Not Applicable

**MAT.098 Gen Ed Preparatory Math**  
4 4

This course is an alternate to MAT.099 Intermediate Algebra for students who are non-STEM (Science Technology Engineering and Math) majors who plan to take MAT 109 Concepts of Math and/or MAT 110 Statistics (Note: STEM and education majors cannot use this to substitute for Intermediate Algebra.) The course focuses on problem solving, critical thinking, and data analysis. Linear equations, quadratics, functions, basic exponents and factoring will be included with modeling and some basic probability and statistics. Group work and projects may be part of the course. The use of technology will be encouraged.  
Offered: Fall or Spring  
Prerequisites: Appropriate placement exam score or MAT.083 with a grade of C or better.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: Not applicable.  
General Education – Not Applicable

**MAT.099 Intermediate Algebra**  
4 4

This course builds upon a student’s early preparation in algebra to provide those skills needed in further study of mathematics, science, or related fields. Topics include the study of the properties of the real number system, polynomials, rational expressions, first-degree equations and inequalities, exponents and radicals, quadratic equations, graphs, functions, systems of linear equations, and logarithms.  
Offered: Fall or Spring or Summer  
Prerequisites: One year of high school algebra and one year of high school geometry with grades of C or better; or the appropriate placement exam score; or take MAT.083 with a grade of C or better.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AAS, AGS, and Certificates where applicable.  
General Education – Not Applicable

**MAT.101 Technical Mathematics 1**  
3 3

This course is designed to serve students enrolled in vocational or technical programs. The emphasis is on skill-building and the applications of mathematics. Topics studied include a review of arithmetic, measurement, approximations, basic algebra, applied geometry, and right triangle trigonometry. Scientific calculators are used and are required of students.  
Offered: Fall  
Prerequisites: Appropriate placement exam score or MAT.080 with a grade of C or better.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AAS, AGS, and Certificates where applicable.  
General Education – Math AGS Only
### MAT.102 Technical Mathematics 2  
This course is a continuation of MAT 101. Topics include linear functions and graphs, laws of sines and cosines, systems of linear equation, exponents and radicals, complex numbers, quadratic equations, logarithms, and other topics from trigonometry. The emphasis is on skill-building and applications of mathematics. A scientific calculator is needed.  
Offered: Fall or Spring  
Prerequisites: MAT.101  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AAS, AGS, and Certificates where applicable.  
General Education – Math

### MAT.109 Concepts of Mathematics  
This course is designed to fulfill general education requirements. In the development of topics, the focus shall be on mathematical reasoning and the solving of real-life problems. Calculators and computers will be used regularly. The units studied include probability and counting techniques, logic and set theory, the mathematics of finance, and statistics. Included in the approach to these topics shall be the use of mathematical models and group projects.  
Offered: Fall or Spring or Summer  
Prerequisites: Two years of high school algebra and one year of high school geometry with grades of C or better; or an ACT Math score of 25; or a score of 4 or 5 on the PARCC exam; or the appropriate placement exam score; or take MAT.086 with a grade of C or better; or MAT.098 with a grade of C or better; or MAT.099 with a grade of C or better.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AA, AS, AAS, AGS, and Certificates where applicable.  
General Education – Math

### MAT.110 General Education Statistics  
Using simulations and data collection, students will learn how to organize and interpret data. Real-life examples will serve as the focus as students develop mathematical reasoning skills and the ability to read and interpret statistical reports. Calculators and computers will be used extensively. Topics include descriptive statistics (graphs, averages, variability), elementary probability theory, probability distributions, hypothesis testing of a single parameter, and correlation and linear regression.  
Offered: Spring or Summer  
Prerequisites: Two years of high school algebra and one year of high school geometry with grades of C or better; or an ACT Math score of 25; or a score of 4 or 5 on the PARCC exam; or the appropriate placement exam score; or take MAT.086 with a grade of C or better; or MAT.098 with a grade of C or better; or MAT.099 with a grade of C or better.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable.  
IAI Course No. M1 904  
General Education – Math

### MAT.111 Mathematics for Elementary Teaching 1  
This course is designed primarily for those students who intend to become elementary school teachers. The emphasis in this course is on problem solving, logic, and mathematical reasoning. The topics studied include sets, logic and reasoning, number bases, modular arithmetic, combinations, and probability.  
Offered: Fall  
Prerequisites: MAT.099 with a grade of C or better or two years of high school algebra and one year of high school geometry with minimum grades of C and a satisfactory score on the department Gateway exam.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AA, AS, AAS, AGS, and Certificates where applicable.  
General Education – Not Applicable Elective Only

### MAT.112 Math for Elementary Teaching 2  
This course is designed primarily for those students planning to become elementary school teachers. The course content includes the study of the properties of the major subsets of real numbers, elementary number theory, the metric system and measurement, and selected topics from descriptive statistics and geometry. Problem solving will be emphasized and calculators will be used extensively.  
Offered: Spring  
Prerequisites: MAT.111 with a grade of C or better and a satisfactory score on the department Gateway exam.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable.  
IAI Course No. M1 903  
General Education – Math

### MAT.130 College Algebra  
This pre-calculus course is appropriate for students whose major interest is in mathematics, science, engineering, or other disciplines requiring a strong preparation in mathematics. The content of this course includes real number properties, linear equations and inequalities, the algebra of functions, exponents, logarithms, systems of linear equations, and sequences and series. Students intending to enter the calculus sequence (MAT 240-242) should also enroll in MAT 140 (Trigonometry).  
Offered: Fall or Spring or Summer  
Prerequisites: Take MAT.099 with a grade of C or better or two years of high school algebra and one year of geometry with grades of C or better, and a satisfactory score on the department’s Gateway Examination.  
Applicable toward graduation at Sandburg where program structure permits:  
Degree or Certificate: AA, AS, AAS, AGS, and Certificates where applicable.  
General Education – Not Applicable Elective Only
MAT.131 Finite Mathematics
3 3

This course is designed for students intending to pursue a baccalaureate degree in an area of business or the social sciences. Topics include the study of the mathematics of finance, matrices, systems of linear equations and inequalities, linear programming, combinations, probability, and Markov Chains.
Offered: Fall or Summer
Prerequisites: MAT.130 with a grade of C or better
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable. IAI Course No. M1 906
General Education – Math

MAT.132 Calculus for Business Or Social Science
3 3

In this course the major ideas of calculus - differentiation and integration - are developed in an intuitive manner. The emphasis is on skill building and on applications of calculus to the areas of business, economics, and social science. The types of functions studied include polynomials, rational, exponential, and logarithmic. Multi-variable content includes applications of partial derivatives. (Credit will NOT be granted for students who have successfully completed MAT.240.)
Offered: Spring or Summer
Prerequisites: MAT.130 with a grade of C or better
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable General Education: Mathematics IAI Course No.: M1 900-B. IAI Course No. M1 900
General Education – Math

MAT.140 Trigonometry
3 3

This pre-calculus course is designed for students whose primary interest is in mathematics, science, or engineering. Students intending to complete the calculus sequence (MAT 240-242) should also enroll in MAT 130. Topics included are in-depth study of trigonometry functions, graphs, identities, trigonometric equations, oblique triangles, complex numbers, and DeMoivre’s Theorem.
Offered: Fall
Prerequisites: MAT.130 with a grade of C or better or concurrent enrollment
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AAS, AGS, and Certificates where applicable. General Education – Not Applicable Elective Only

MAT.210 Statistics
3 3

This course is appropriate for those pursuing careers in the social or natural sciences or in business. Included are units on descriptive statistics, probability theory, random samples, hypothesis testing, regression and correlation, chi-square tests, and an introduction to ANOVA.
Offered: Spring or Summer
Prerequisites: MAT.130 with a grade of C or better
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable. IAI Course No. M1 902
General Education – Math

MAT.240 Calculus With Analytic Geometry 1
5 5

The calculus sequence is intended for those students whose major interest is in mathematics, engineering, or the physical sciences. Major topics covered include a review of lines and functions, limits, the derivative, applications of differentiation, the definite integral, and selected topics from analytic geometry.
Offered: Spring
Prerequisites: MAT.130 and MAT.140, with a grade of C or better in each
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable. IAI Course No. M1 900
General Education – Math

MAT.241 Calculus With Analytic Geometry 2
5 5

This course is a continuation of MAT 240. Topics covered include applications and techniques of integration, inverse trigonometric functions, improper integrals, polar coordinates, parametric equations, conic sections, infinite series, and Taylor series. Additional topics from analytic geometry may be included.
Offered: Fall
Prerequisites: MAT.240 with a grade of C or better
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable. IAI Course No. M1 900
General Education – Math

MAT.242 Calculus With Analytic Geometry 3
4 4

This course is a continuation of MAT 241. Topics covered include vectors in 2-space and 3-space, vector-valued functions, partial derivatives and applications, and applications involving multiple variable integration.
Offered: Spring
Prerequisites: MAT.241 with a grade of C or better
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable. IAI Course No. M1 900
General Education – Math

MAT.260 Differential Equations
3 3

This course is suitable for students pursuing a career in engineering, physical science, or mathematics. Included are these topics involving solutions to ordinary differential equations: first and second order equations; linear equations; systems of linear equations; LaPlace transforms; applications; numerical approximations.
Offered: As Needed
Prerequisites: MAT.242 with a grade of C or better
Applicable toward graduation at Sandburg where program structure permits:
Degree or Certificate: AA, AS, AAS, AGS, and Certificates where applicable. General Education – Not Applicable Elective Only