

# CGS MATHEMATICS (CGS MAT)

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## CGS MAT 75 Math Success Strategies

0 cr.

Highly interactive format providing mathematics instruction and instilling study skills and strategies for succeeding in mathematics courses.

**Prerequisites:** none.

**Course Rules:** Previously CGS MAT 99. Fee for 3 credits assessed; 3 credits count toward credit load for Financial Aid and enrollment verification only. Satisfactory/Unsatisfactory only.

**Last Taught:** Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 75X Math Success Strategies

0 cr.

Highly interactive format providing mathematics instruction and instilling study skills and strategies for succeeding in mathematics courses.

**Prerequisites:** none.

**Course Rules:** Previously CGS MAT 99. Fee for 3 credits assessed; 3 credits count toward credit load for Financial Aid and enrollment verification only. Satisfactory/Unsatisfactory only.

**Last Taught:** Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 81 Topics in Geometry

0 cr.

Designed for students who have not had high school geometry. Includes methods of proof, properties of simple plane figures, congruence, and similarity.

**Prerequisites:** none.

**Course Rules:** Fee for 3 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 88 Math Support for Math Literacy Courses

1 cr.

A supplementary support course for CGS MAT 92/CGS MAT 102 or CGS MAT 103. Students will be introduced to math specific study skills and will receive supplemental instruction in their mathematics coursework.

**Prerequisites:** none.

**Course Rules:** May be retaken twice for credit. Satisfactory/Unsatisfactory only.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 89 Math Support for Algebraic Math Courses

1 cr.

Supplementary support course for CGS MAT 75, CGS MAT 98/CGS MAT 108, or CGS MAT 105. Students will be introduced to math-specific study skills and will receive supplemental instruction in their mathematics coursework.

**Prerequisites:** none.

**Course Rules:** May be retaken twice for credit. Satisfactory/Unsatisfactory only.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 91 Elementary Algebra

0 cr.

Intended for students with little or no previous algebra. Topics include the real number system and operations with real numbers and algebraic expressions, linear equations and inequalities, polynomials, factoring, and introduction to quadratic equations.

**Prerequisites:** none.

**Course Rules:** Fee for 3 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only.

**Last Taught:** Summer 2020, Spring 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 92 Mathematical Literacy for College Students I

0 cr.

Introduction to numeracy, proportional reasoning, algebraic reasoning, and functions. Emphasis on developing conceptual and procedural tools that support the use of key mathematical concepts in context.

**Prerequisites:** none.

**Course Rules:** Fee for 3 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only. Students must enroll in corresponding section of CGS MAT 102. Not recommended for students planning to take Calculus. Students registering after classes have begun will have missed class sessions counted against their attendance for this course.

**Last Taught:** Summer 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 98 Algebraic Literacy I

0 cr.

Arithmetic number systems; linear equations, inequalities; exponent notation, radicals; polynomials, operations, factoring; modeling; coordinate geometry; linear systems; quadratic equations.

**Prerequisites:** Math Placement Level 10.

**Course Rules:** Fee for 3 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only. Students must enroll in corresponding section of CGS MAT 108. Students registering after classes have begun will have missed class sessions counted against their attendance for this course.

**Last Taught:** Summer 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

## CGS MAT 100 Supplemental Math

1-2 cr.

Development of foundational skills and concepts to allow concurrent enrollment in certain credit-bearing mathematics courses in place of prerequisite enrollment.

**Prerequisites:** consent of department.

**Course Rules:** Repeatable to 2 cr max with change in topic. Specific topic and additional prerequisites announced in schedule of classes each time course is offered.

**Last Taught:** Spring 2024, Fall 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 100A Beginning and Intermediate Algebra**

0 cr.

UW COLLEGES COURSES ONLINE ONLY. Arithmetic operations, equations/inequalities involving the algebraic objects are solved including polynomial equations through the quadratic formula. Linear/quadratic, rational/radical equations, algebraic/graphical representation of lines and interpreting graphical representation of functions.

**Prerequisites:** grade of C or better in CGS MAT 090 or based on placement test score.

**Course Rules:** Fee for 1 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 100B Beginning and Intermediate Algebra**

3 cr.

UW COLLEGES COURSES ONLINE ONLY. Arithmetic operations, equations/inequalities involving the algebraic objects are solved including polynomial equations through the quadratic formula. Linear/quadratic, rational/radical equations, algebraic/graphical representation of lines and interpreting graphical representation of functions.

**Prerequisites:** grade of C or better in CGS MAT 090 or based on placement test score.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 101 Introduction to College Algebra**

3-4 cr.

UW COLLEGE COURSES ONLINE AND ASSOCIATE FLEX PROGRAM ONLY. Algebraic techniques with polynomials, fractional expressions, exponents and radicals, linear and quadratic equations, and inequalities. Introduction to functions, their graphs, and analytic geometry.

**Prerequisites:** grade of C or better in Elementary Algebra or CGS MAT 100A or placement based on placement test score.

**Last Taught:** Summer 2020, Spring 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 101X Introduction to College Algebra**

3-4 cr.

UW COLLEGE COURSES ONLINE AND ASSOCIATE FLEX PROGRAM ONLY. Algebraic techniques with polynomials, fractional expressions, exponents and radicals, linear and quadratic equations, and inequalities. Introduction to functions, their graphs, and analytic geometry.

**Prerequisites:** grade of C or better in Elementary Algebra or CGS MAT 100A or placement based on placement test score.

**Last Taught:** Summer 2020, Spring 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 102 Mathematical Literacy for College Students II**

3 cr.

Continuation of CGS MAT 92, with an integrated approach to numeracy, proportional reasoning, algebraic reasoning, and functions.

**Prerequisites:** Math Placement Level 10 or concurrent enrollment in CGS MAT 92(P).

**Course Rules:** Students with a Math Placement Level of less than 10 must also enroll in the corresponding section of CGS MAT 92.

**Last Taught:** Summer 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 102X Mathematical Literacy for College Students II**

3 cr.

Continuation of CGS MAT 92, with an integrated approach to numeracy, proportional reasoning, algebraic reasoning, and functions.

**Prerequisites:** Math Placement Level 10 or concurrent enrollment in CGS MAT 92(P).

**Course Rules:** Students with a Math Placement Level of less than 10 must also enroll in the corresponding section of CGS MAT 92.

**Last Taught:** Summer 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 103 Contemporary Applications of Mathematics**

3 cr.

Course focuses on analytic reasoning and quantitative problem solving. Topics include construction and interpretation of graphs, functional relationships, descriptive statistics, geometry and spatial visualization, math of finance, exponential growth, voting theory, and basic probability.

**Prerequisites:** Math Placement Level 10.

**Course Rules:** Not recommended for students planning to take Calculus.

**Last Taught:** Spring 2024, Fall 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 105 Introduction to College Algebra**

3 cr.

Algebraic techniques with polynomials, fractional expressions, exponents and radicals, linear and quadratic equations, and inequalities. Introduction to functions, their graphs, and analytic geometry.

**Prerequisites:** Math Placement Level 20 or grade of C or better in CGS MAT 98(P).

**Course Rules:** Counts as repeat of CGS MAT 108.

**Last Taught:** Summer 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 105X Introduction to College Algebra**

3 cr.

Algebraic techniques with polynomials, fractional expressions, exponents and radicals, linear and quadratic equations, and inequalities. Introduction to functions, their graphs, and analytic geometry.

**Prerequisites:** Math Placement Level 20 or grade of C or better in CGS MAT 98(P).

**Course Rules:** Counts as repeat of CGS MAT 108.

**Last Taught:** Summer 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 108 Algebraic Literacy II**

3 cr.

Continuation of CGS MAT 98 in polynomials, equations, and inequalities; exponential, logarithmic, and periodic functions; rational expressions and exponents; and systems of linear equations.

**Prerequisites:** Math placement Level 10.

**Course Rules:** Students must register in the corresponding section of CGS MAT 98. Counts as repeat of CGS MAT 105.

**Last Taught:** Summer 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 110 College Algebra**

3 cr.

Definition of function and sequence; linear and nonlinear functions and graphs including logarithmic and exponential functions; systems of linear equations and Gauss-Jordan method; theory of polynomial equations; conic sections and optional topics such as mathematical induction, matrix solution of linear systems and Cramer's rule.

**Prerequisites:** A grade of C or better in CGS MAT 103B or CGS MAT 101 or placement based on placement test score.

**Course Rules:** Equivalent to MATH 116.

**Last Taught:** Summer 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 110X College Algebra**

3 cr.

Definition of function and sequence; linear and nonlinear functions and graphs including logarithmic and exponential functions; systems of linear equations and Gauss-Jordan method; theory of polynomial equations; conic sections and optional topics such as mathematical induction, matrix solution of linear systems and Cramer's rule.

**Prerequisites:** A grade of C or better in CGS MAT 103B or CGS MAT 101 or placement based on placement test score.

**Course Rules:** Equivalent to MATH 116.

**Last Taught:** Summer 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 113 Trigonometry**

2 cr.

UW COLLEGE COURSES ONLINE ONLY. Trigonometric functions, their basic properties and graphs, identities, inverse trigonometric functions, solving trigonometric equations, solutions of triangles.

**Prerequisites:** a grade of C or better in CGS MAT 110(P); or concurrent registration in CGS MAT 110(C); or placement based on placement test score.

**Last Taught:** Summer 2020, Spring 2020, UWinterIM 2020, Fall 2019.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 115 Precalculus**

4 cr.

Essential topics from college algebra and trigonometry for students intending to enroll in calculus.

**Prerequisites:** Math Placement Level 30 or grade of C or better in CGS MAT 105(P), CGS MAT 108(P), or CGS MAT 116(P).

**Course Rules:** Repeats two credits of CGS MAT 116 and two credits of CGS MAT 117.

**Last Taught:** Summer 2023, Spring 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 116 College Algebra**

3 cr.

Definition of function and sequence; linear and nonlinear functions and graphs including logarithmic and exponential functions; systems of linear equations and Gauss-Jordan method; theory of polynomial equations; conic sections and optional topics.

**Prerequisites:** Math Placement Level 20 or grade of C or better in CGS MAT 94(P), CGS MAT 95(P), or CGS MAT 98(P).

**Course Rules:** Two credits may be used to repeat two credits of CGS MAT 115.

**Last Taught:** Spring 2020, Fall 2019.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 116X College Algebra**

3 cr.

Definition of function and sequence; linear and nonlinear functions and graphs including logarithmic and exponential functions; systems of linear equations and Gauss-Jordan method; theory of polynomial equations; conic sections and optional topics.

**Prerequisites:** Math Placement Level 20 or grade of C or better in CGS MAT 94(P), CGS MAT 95(P), or CGS MAT 98(P).

**Course Rules:** Two credits may be used to repeat two credits of CGS MAT 115.

**Last Taught:** Spring 2020, Fall 2019.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 117 Trigonometry**

2 cr.

Trigonometric functions; graphs, identities, equations, inequalities; inverse trigonometric functions; solutions of triangles with applications; complex numbers; polar coordinates.

**Prerequisites:** Math Placement Level 30 or grade of C or better in CGS MAT 105(P), CGS MAT 108(P), or CGS MAT 116(P).

**Course Rules:** Repeats 2 credits of CGS MAT 113.

**General Education Requirements:** MS

**Last Taught:** Spring 2024, Spring 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 124 Pre-Calculus Mathematics**

5 cr.

Essential topics from College Algebra and Trigonometry for students intending to enroll in Calculus. Covers similar material as CGS MAT 115 but at a slower pace.

**Prerequisites:** Math Placement Level 20 or grade of C or better in CGS MAT 98(P).

**Course Rules:** Students may not earn more than five credits of any combination of CGS MAT 110, CGS MAT 113, CGS MAT 115, CGS MAT 116, CGS MAT 117, and CGS MAT 124.

**Last Taught:** Summer 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 130 Mathematics for Elementary Teachers**

4 cr.

A mathematics content course for prospective elementary teachers.

Emphasis is on development of properties of arithmetic. Topics also may include elementary concepts of algebra, probability, and statistics. Four hours lecture or three hours lecture and two hours laboratory per week.

**Prerequisites:** A grade of C or better in CGS MAT 103B or CGS MAT 105 or CGS MAT 108, or two years of high school algebra and one year of high school geometry, or cons. instr.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 175 Mathematical Explorations for Elementary Teachers I**

3 cr.

Theory of arithmetic of whole numbers, fractions, and decimals. Introduction to algebra, estimation and problem-solving strategies.

**Prerequisites:** Math Placement Level 20 or higher or grade of C or better in CGS MAT 102(P), CGS MAT 103(P), CGS MAT 108(P).

**General Education Requirements:** MS

**Last Taught:** Spring 2024, Spring 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 176 Mathematical Explorations for Elementary Teachers II**

3 cr.

A continuation of CGS MAT 175 in geometry, statistics, and probability.

**Prerequisites:** Math Placement Level 20 or higher or grade of C or better in CGS MAT 102(P), CGS MAT 103(P), or CGS MAT 108(P).**General Education Requirements:** MS**Last Taught:** Fall 2023, Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 210 Topics in Finite Mathematics**

3-4 cr.

UW COLLEGES COURSES ONLINE ONLY. Matrices, linear programming and applications, probability, Markov chains, and mathematics of finance.

**Prereq:** A grade of C or better in MAT 110 or MAT 124 or equivalent or placement based on placement test score.**General Education Requirements:** MS**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 211 Calculus**

4 cr.

A one-semester survey with applications to business administration, economics, and non-physical sciences. Topics include coordinate systems, equations of curves, limits, differentiation, integration, applications.

**Prerequisites:** Math Placement Level 30 or grade of C or better in CGS MAT 105(P), CGS MAT 108(P), or CGS MAT 116(P).**Course Rules:** May not be used as a prereq for CGS MAT 222. No credit for students with credit in CGS MAT 221.**General Education Requirements:** MS**Last Taught:** Summer 2024, Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 215 Elementary Statistical Analysis**

3 cr.

Elementary probability theory; descriptive statistics; sampling distributions; basic problems of statistical inference including estimation; tests of statistical hypothesis in both one- and two- sample cases.

**Prerequisites:** Math Placement Level 30 or higher, or a grade of C or better in CGS MAT 102, CGS MAT 103, CGS MAT 105, CGS MAT 108, CGS MAT 115, or CGS MAT 116.**General Education Requirements:** MS**Last Taught:** Summer 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 215X Elementary Statistical Analysis**

3 cr.

Elementary probability theory; descriptive statistics; sampling distributions; basic problems of statistical inference including estimation; tests of statistical hypothesis in both one- and two- sample cases.

**Prerequisites:** Math Placement Level 30 or higher, or a grade of C or better in CGS MAT 102, CGS MAT 103, CGS MAT 105, CGS MAT 108, CGS MAT 115, or CGS MAT 116.**General Education Requirements:** MS**Last Taught:** Summer 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 221 Calculus and Analytical Geometry I**

5 cr.

Analytic geometry, functions, limits and continuity, the derivative, integrals, techniques and applications of differentiation, applications of integration, logarithmic and exponential functions, and trigonometric functions.

**Prerequisites:** Math Placement Level 40; or grade of C or better in CGS MAT 115(P); or both proficiency in Trigonometry (grade of C or better in CGS MAT 117(P), or Level 26 or 36 on Math Placement Test) and proficiency in Algebra (grade of C or better in CGS MAT 116(P) or CGS MAT 211(P), or Level 35 on Math Placement Test).**Course Rules:** Students may not earn more than six credits by taking both CGS MAT 211 and CGS MAT 221.**General Education Requirements:** MS**Last Taught:** Summer 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 222 Calculus & Analytical Geometry II**

5 cr.

UW COLLEGE COURSES ONLINE ONLY. Continuation of CGS MAT 221.

Techniques of integration, polar coordinates, conic sections, infinite series, and vectors of two and three dimensions.

**Prerequisites:** A grade of C or better in CGS MAT 221, or placement based on the department Calculus Proficiency Test or AP exam.**Course Rules:** The order of topics covered in CGS MAT 221 and CGS MAT 222 may depend on the text used and the instructor.**General Education Requirements:** MS**Last Taught:** Summer 2020, Spring 2020, Fall 2019.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 228 Statistical Analysis**

3 cr.

Elements of probability theory; collection and presentation of sample data; basic problems of statistical inference; applications, including quality control; regression; and hypothesis testing.

**Prerequisites:** grade of C or better in CGS MAT 211, CGS MAT 221, or equivalent.**General Education Requirements:** MS**Last Taught:** Spring 2020.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 229 Linear Algebra**

3 cr.

Matrix algebra, linear systems of equations, vector spaces, subspaces, linear dependence, rank of matrices, determinants, linear transformations, eigenvalues and eigenvectors, diagonalization, inner products and orthogonal vectors, and symmetric matrices.

**Prerequisites:** A grade of C or better in CGS MAT 222.**General Education Requirements:** MS**Current Offerings:** <https://catalog.uwm.edu/course-search/>**CGS MAT 232 Calculus and Analytic Geometry II**

4 cr.

Continuation of CGS MAT 221. Applications of integration, techniques of integration; infinite sequences and series; parametric equations, conic sections, and polar coordinates.

**Prerequisites:** grade of C or better in CGS MAT 221.**Last Taught:** Summer 2024, Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 233 Calculus and Analytic Geometry III**

4 cr.

Continuation of CGS MAT 232. Three-dimensional analytic geometry and vectors; partial derivatives; multiple integrals; vector calculus, with applications.

**Prerequisites:** grade of C or better in CGS MAT 232.

**Last Taught:** Summer 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 234 Linear Algebra and Differential Equations**

4 cr.

Elementary differential equations. Vectors; matrices; linear transformations; quadratic forms; eigenvalues; applications.

**Prerequisites:** grade of C or better in CGS MAT 232 or equivalent.

**General Education Requirements:** MS

**Last Taught:** Summer 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**CGS MAT 271 Ordinary Differential Equations**

3 cr.

Ordinary differential equations of the first and second order, series solutions, higher order linear equations, the Wronskian, Laplace transform and applications, numerical methods and boundary value problems.

**Prerequisites:** A grade of C or better in CGS MAT 222.

**General Education Requirements:** MS

**Last Taught:** Spring 2020, Fall 2019.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>