Complete Entry-Level Math Course Descriptions and Example Skills

Welcome to UCCS! The Math Department is excited to support you as you work toward your college and career goals.

We recognize that our students have a variety of backgrounds, goals, and interests; as you start to build your schedule, this document is designed to help you to select the math class that will best support your success.

The different majors at UCCS have varied math requirements, but every UCCS student must fulfill the Compass Curriculum Quantitative Reasoning requirement. For some students Math 1040 (College Algebra) satisfies that requirement. Some other majors require courses for which Math 1040 is a prerequisite. For the math- and science- heavy STEM majors, College Algebra is the first step on the journey towards calculus. If you aren’t sure what math is required for your major, please contact academic advising for assistance.

You can fulfill the College Algebra requirement, or place into a subsequent math course in one of four ways: with a sufficient ACT or SAT score, by taking the ACCUPLACER placement test, by meeting a benchmark high school GPA and completing an advanced high school mathematics course, by transferring in prerequisite credit with an appropriate college course or AP test score, or by taking the College Algebra course here at UCCS.

For more details on the specific placement requirements for each of these courses, please visit [our math placement website](https://math.uccs.edu/math-course-placement-information). Make sure to submit your ACT or SAT scores to UCCS as soon as possible; if you have no ACT or SAT scores, you will place into Math 099 by default. If your ACT or SAT scores alone do not put you into a what you believe to be the most appropriate course, register to take the ACCUPLACER exam as soon as possible to challenge that placement.

The math department offers many courses that fulfill the QR requirement; let’s look at those options so that you can choose the course that will be the best fit for you. In general, keep in mind that for any college level math course, you cover topics much quicker than in high school – we’re basically cramming a full year of high school content into one college semester. This means you need to be prepared to do a lot of work outside of class; not just the required homework, but also studying, practicing, and reviewing.

# Math 99: Algebraic Literacy

Course description:

Math 099 is a course designed to help you brush up your math skills. The topics include factoring, simplifying polynomial and rational expressions, working with radicals and absolute values, linear and quadratic equations, solving inequalities, and the basics of graphing. Math 099 is a developmental education course, and as such, credits earned in Math 099 do not count toward your degree. This may lengthen the amount of time it takes you to get your degree. Some students *do* need or want this course, so that they can strengthen their algebra skills before taking College Algebra (Math 1040).

The course is a 5 credit hour class so you should expect the class to meet for 5 hours per week. In addition, you should expect to spend 5-10 hours on homework per week. This class is run through the Extended Studies program so it can offer reduced tuition but to register you need to select Extended Studies in the registration portal.

## Example Skills:

1. Factor $6x^{2}-x-2$.
2. Simplify $\sqrt{\frac{4xy^{2}}{x^{3}y}}$.
3. Solve $\left|3x-1\right|=2$.
4. Add $\frac{5}{x+1}+\frac{3x}{x-2}$.
5. Simplify $\frac{1+\frac{2}{x}}{3+x}$
6. Solve $4x-5\geq 3$
7. Graph $f\left(x\right)=3x-4$.
8. Solve $6x^{2}-x-2=0$.

# Math 1040: College Algebra

Course description:

College Algebra is an intensive study of algebraic functions, equations, and inequalities required for future math and science classes. In order to succeed in this class, you should already be comfortable with all the material from Math 099. The class emphasizes functions, function notation and the properties of functions. The functions studied include linear, polynomial, rational, exponential, and logarithmic functions.

The class is a 4 credit hour class. Different sections have different meeting patterns, but they will all be equivalent to 3 hours and 45 minutes of lecture per week. In addition to the lecture time, you should expect to spend 5-10 hours on homework per week. The course grade is based on in-class work, homework, 3 midterm exams and a cumulative final exam.

## Example Skills:

1. Solve $\sqrt{15-2x}=x$.
2. Find the equation for the line that contains the points (1,3) and (-1,2).
3. Given $f\left(x\right)=3-x^{2}$, evaluate $f\left(2\right), f\left(x+2\right),$ and $\frac{f\left(x+h\right)-f(x)}{h}$.
4. Let $f\left(x\right)=x^{2}+2x-8$. Find the following:
	1. Vertex
	2. Axis of symmetry
	3. Concavity
	4. Intercepts
	5. Sketch the graph of the function
5. Graph $R\left(x\right)=\frac{x^{2}+3x-10}{x^{2}+8x+15}$.
6. Let $f\left(x\right)=x+1 $and $g\left(x\right)=x^{2}+4$. Find $f∘g$ and state its domain.
7. Solve $log\_{2}(x+1)+log\_{2}(x+7)=3$.
8. Solve $e^{2x-1}=14$.

# Math 1030: College Algebra with Supplemental Instruction

Course description:

This course covers the same materials as College Algebra, but with additional supplemental instruction as needed. The skills covered in the course will be the same as for Math 1040, with the addition of skills from Math 099 (and before) as student needs arise. This course is designed for students who *almost* would qualify for placement in Math 1040, but who may need additional support to thrive.

The class is a 6 credit hour class. Different sections have different meeting patterns but they will all be equivalent to 5 hours of lecture per week. In addition to the lecture time, you should expect to spend 10-15 hours on homework per week. The course grade is based on in-class work, homework, midterm exams and a cumulative final exam.

## Example skills:

The example skills are the same as for Math 1040 (above), with additional supplementary skills as identified by the instructor and/or students.

# Math 1060: Trigonometry

## Course Description:

Trigonometry is a deep dive into angles, right triangle trigonometry, trigonometric functions, and trigonometric identities. If none of these topics sound familiar, you definitely want to take this class before tackling Calculus I, because knowledge of Trigonometry is crucial to succeeding in Calculus I.

This is a 3 CH class that typically meets two times a week for a total of 2 and a half hours. You should still expect to spend 5-10 hours on homework per week, especially if working with Trigonometric functions is new to you. Typically, the course includes class work, homework, 3 exams, and a cumulative final exam.

## Example skills:

1. Convert $\frac{3π}{4}$ to degrees. Convert $270^{∘}$ to radians.
2. Solve word problems involving arc length, sector area, and linear and angular velocity.
3. Given a right triangle, use trigonometric functions to solve for a missing side or angle.
4. Use right triangles to solve word problems.
5. Evaluate common trigonometric values without a calculator, like $\cos(\left(\frac{2π}{3}\right))$ or $\tan(\left(\frac{7π}{4}\right))$.
6. Graph trigonometric functions without a calculator, like $y=-2\sin(\left(πx+\frac{π}{4}\right))+1$.
7. Evaluate common inverse trigonometric values without a calculator, like $\arcsin(\left(-\frac{1}{2}\right))$, or $\sin(\left(\arccos(\left(\frac{3}{7}\right))\right))$.
8. Solve trigonometric equations.
	1. $\sin(\left(x\right))=\frac{\sqrt{3}}{2}$
	2. $\cos(\left(2x\right))-1=0$
	3. $sin^{2}(x)+2\sin(\left(x\right))+1=0$
9. Use trigonometric identities to simplify expressions and verify identities.
	1. $\frac{sin^{2}\left(x\right)+cos^{2}(x)}{2\sin(\left(x\right))cos⁡(x)}$

# Math 1120: Business Calculus

## Course Description:

Math 1120: Business Calculus is a course designed to give students majoring in business or economics the basic skills needed to apply techniques from elementary calculus to their respective fields. Basic algebraic applications in finance are covered and followed by discussion of the main topics in calculus (i.e. limits, derivatives, and integrals) as they relate to applications in business and economics. This course does *not* use trigonometry, so Math 1060 is not a prerequisite.

The course progresses by covering an average of one textbook section per each 1 hour 15-minute class session. The expectation is that students will utilize quantitative and qualitative reasoning skills to solve assigned problems on the various assignments by justifying answers with valid work.

This is a 3 CH class that typically meets two times a week for a total of 2 and a half hours. You should still expect to spend 5-10 hours on homework per week. Typically, the course includes class work, homework, 3 exams, and a cumulative final exam.

# Math 1350 and Math 1130: Calculus 1 and Calculus for Life Sciences

## Course Descriptions:

Calculus 1 and Calculus for Life Sciences both cover the major topics of Calculus: limits, derivatives, and integration. Math 1350 focuses more on mathematical and physics-adjacent applications of these skills, while Math 1330 focuses more on biology and the life sciences applications of Calculus. Both courses require that you have a firm grasp of trigonometry and solid algebra skills. It is often said that the *calculus* itself isn’t difficult, it’s the *algebra*. Because of this, even if you have taken AP Calculus, or another Calculus course in high school, you may want to take College Algebra or Trigonometry before taking a college-level Calculus course.