

Syllabus for Math 104 – Precalculus

Fall 2019

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Required Items:

- **Textbook:** Precalculus, OpenStax, Abramson, *Precalculus 1e* (The electronic version of this textbook is free and can be obtained at <https://openstax.org/details/books/prec calculus> . Physical copies are also available at KU bookstore.)
- **Access Code for WebAssign** (can be bought at KU bookstore or within WebAssign access link on your course Blackboard page.)

This syllabus contains the basic information for MATH 104, but is a static document. Students should regularly visit the course Blackboard page (courseware@ku.edu) to find their grades, course announcements, and links to course materials.

Students **must** regularly check both their KU email and the course Blackboard page.

Prerequisite: MATH 002 or 2 years of high school algebra and a score of 22 or more on Enhanced ACT Mathematics, or a qualifying score on the mathematics placement test. Not open to students with credit in MATH 103.

Topics

Chapters	Topics
Chapter 1 (Sec 1-7)	Functions
Chapter 2 (Sec 1-3)	Linear Functions
Chapter 3 (Sec 1-8)	Polynomial and Rational Functions
Chapter 4 (Sec 1-7)	Exponential and Logarithmic Functions

Chapter 5 (Sec 1-5)	Trigonometric Functions
Chapter 6 (Sec 1-3)	Periodic Functions
Chapter 7 (Sec 1-6)	Trigonometric Identities and Equations
Chapter 8 (Sec 1-7)	Further Applications of Trigonometric Functions
Chapter 9 (Sec 1-3, 5-6)	Systems of Equations and Matrices
Chapter 10 (Sec 1-3)	Analytic Geometry

Objectives and Course Contents

The course is an introduction to the elementary functions (polynomial, rational, exponential, logarithmic, and trigonometric) and their properties. The objective of the course is to acquire mastery of the material covered in the course in the following senses:

Analysis and Graphing of Functions

- Analyzing/ evaluating a function using a rule of the function, a table of values or a graph; using function notation; finding the domain and range of a function; writing the rule of a function; analyzing functions in applications; finding average rate of change; relating average the rate of change to the net change in piecewise defined and linear functions; recognizing extrema in a graph or in quadratic model.
- Using concepts of symmetry; intercepts, left and right-hand behavior, asymptotes, and transformations; to sketch the graph of various types of functions (constant, linear, quadratic, absolute value, piecewise-defined, square root, cubic, polynomial, rational, exponential, and logarithmic).
- Writing equations of circle, ellipse, hyperbola given their descriptions.
- Performing $+$, $-$, \times , division, composition and inverse operations on functions; analyzing real-life application of these operations.

Solutions of Equations and Inequalities

- Solving linear, quadratic or cubic equations in one variable involving one or multiple parameter(s); solving equations involving radicals, rational expressions or absolute values; solving exponential and logarithmic equations.
- Solving systems of linear equations; understanding the geometry of the solution(s); inconsistent, distinct point or infinite. Performing Gaussian reduction; $+$, $-$, \times matrix operations. Knowing examples

of non-commutative matrix products. Recognizing a vector as a matrix. Solving systems of non-linear equations.

- Solving linear, polynomial, rational or absolute value inequalities by graphing.

Trigonometry

- Converting between radian measurement and degree measurement; understanding the relationship between radian and arc length of a circle; understanding angular velocity.
- knowing six trigonometric values of all angles; whose reference angles are special angles 0 , $\pi/6$, $\pi/4$, $\pi/3$, and $\pi/2$.
- Solving for an unknown sides/angles within right triangles.
- Graphing the six basic trigonometric functions and their arithmetic combinations; understanding the concepts of period, phase shift, amplitude, and vertical displacement.
- Deriving/verifying trigonometric identities, including but not limited to double angle, half angle, angle sum, and angle difference identities.
- Defining, graphing, and applying inverse trigonometric functions.
- Solving trigonometric equations; recognizing the difference between an identity and a trigonometric equation.
- Finding solutions of oblique triangles using the Law of Cosines and/or Law of Sines.
- Deriving the trigonometric form of complex numbers and perform calculations with them including products and quotients.
- Converting between rectangular and polar coordinates; graphing within the polar coordinate systems.
- Understanding basic parameterized curves; the conversion between parameterized curves and a function rule; understanding parameterized form of a circle, ellipse and hyperbola.

Grading System

A	B	C	D
<u>≥ 90</u>	<u>≥ 80</u>	<u>≥ 70</u>	<u>≥ 60</u>

Note that there are no plus/minus grades in the precalculus/calculus sequence. The letter grade cut-offs given above guarantees the given grade but the cut-off may be lowered at the discretion of the coordinator. Many assignments and assessments will have bonus credit opportunities.

The following is a breakdown for MATH 104 showing the components of the course and how much each component is worth.

Group Work	5%
WebAssign Homework	5%
Participation	5%
Quizzes	5%
Gateway Exam	10%
Midterm Exam I	20%
Midterm Exam II	20%
Final Exam	30%

Common Course Exams

MATH 104 will have three types of exam which, collectively, make up **80%** of the final grade:

1. **The Gateway Exam:**

Information regarding the Gateway can be found at

<https://mathematics.ku.edu/gateway-exams>

Students can earn a score of 0 or 10 on the Gateway. Students earn full credit by passing either the Paper Gateway Exam or the In-Lab Gateway Exam. Information about the In-Lab Gateway Exams, including deadlines and locations, can be found online.

First Day: **Wednesday 10/16** at 9:00am

Deadline: Friday 11/8 at 5:00pm (Last exam is at 4:20)

A Paper Gateway Exam will be administered in laboratory sections during the class on Thursday of Week 8. Students who correctly answer 7, 8, 9, or 10 of the 10 questions earn full credit and do **not** need to take the In-Lab Gateway Exam.

2. Midterm Exams:

Paper exams which are hand graded by MATH 104 instructors. Midterm Exams from three previous semesters can be found on Blackboard.

Midterm Exam 1 T 10/1 5:50 – 7:50pm Chapters 1, 2, 3 and 4.1-4.2

Midterm Exam 2 T 11/5 5:50 – 7:50pm Chapter 4,5,6,7 and 8.1-8.2

3. Final Exam: Cumulative - administered Tuesday, December 17, 4:30-7:00pm.

Calculators and Common Exams: Only basic or scientific calculators will be permitted while taking exams. Calculators must **not** be able to perform calculus calculations (limits, derivatives, integrals, series) and must have **no** graphing capabilities.

Recommended Calculator: TI – 30XIIS. No scientific Casio calculator is permitted.

WebAssign

WebAssign is an online homework system that will be used for online homework. The version of the textbook available through the University Bookstore (in both hard copy and e-book formats) comes equipped with a WebAssign Key. It is important that you buy the version of the textbook with a WebAssign Key; otherwise your WebAssign score will be null. Two types of assignments will be completed through WebAssign:

1. The In-Lab Gateway Exam will be completed through WebAssign.
2. A WebAssign Homework will be assigned for one or two (up to three) sections and will be due at 11:59pm four to seven days after the lecture those sections concludes. A WebAssign Homework is due on most Mondays, Wednesdays and Fridays. If you miss the due date for an assignment, you can request an automatic extension on webAssign for that assignment. The penalty for late assignment is 10% of the points for that assignment.

3. It is recommended that students who are taking multiple courses with WebAssign to purchase an unlimited WebAssign Key.
4. Another type of online homework is WarmUp questions. WarmUp questions count as **extra** credit and students can earn up to 3 percentage points towards their final grade. Find the WarmUp questions for each section on the weekly content folder on the course blackboard. The warmup assignments are due on most Fridays but you are encouraged to watch the videos, read the section and answer warmup questions before coming to each lecture.

Lecture Participation

Most lectures will consist of a brief introduction and some problems to do in class. It is recommended to read the appropriate section of your book before the lecture and print any handout that is posted weekly on the weekly content of your blackboard. Come in prepared to do the problems with your friends and classmates and ask for help from your instructor. This is what is called lecture participation. Any students who participates 90% of the lectures will be awarded full lecture participation and any percentage over 90% will count as Extra Credit.

There will be **no** make-ups for lecture participation, quizzes or group work.

GroupWork

On the date announced, print the group work posted to your course Blackboard and bring to class. Every student should write their own work but participate in the discussions with 2-3 of their peers on how to solve the problems. Part of the score will be awarded in class for this participation. You complete the rest of assignment after class. Most GroupWork will be collected in class on the **following Friday**. Then it will be graded for accuracy.

Quizzes

Quizzes will be given in class and will cover a section or two sections of the book.

All graded material will be returned during the class. The instructors of MATH will check the grading of any assignment if the assignment was graded within the past **two** weeks; after two weeks, the instructors are **not** obligated to check the grading of an assignment. Initially contact your GTA before contacting your coordinator for any grade disputes.

Make-ups

Make-ups will **not** be available for the Gateway Exam. **DO NOT WAIT UNTIL THE DEADLINE 11/8 TO TAKE THE GATEWAY EXAM.** The average student does not pass until the fifth attempt and some students need many more attempts.

WebAssign Homework can be completed after the deadline for 90% credit by requesting an extension through WebAssign. An extension will automatically be granted.

Exams and Laboratory Sections: Students with a conflict with another course or verifiable excuse (temporary orders necessitating the absence of those in the US Armed Forces, sanctioned university activities, or a medical crisis of themselves, a relative, or friend) may be excused from being present. It is the responsibility of the student to initiate discussion with their instructor or graduate teaching assistant prior to the absence examination/test if possible. Students can formally request their exam to be rescheduled due to a conflict by completing an Exam Conflict form which will be forwarded two weeks before the exam is scheduled.

Religious Holidays: Any student in this course who plans to observe a religious holiday which conflicts in any way with the course schedule or requirements should contact your instructor before the end of the second week of classes to discuss alternative accommodations.

Math Help

Every instructor and graduate teaching assistant is available for help outside the classroom, see individual webpages to find times and locations. The Mathematics Help Room can be found in Snow 651 and is staffed by helpful and competent mathematics graduate teaching assistants. Before searching for a private tutor, be sure to visit either your instructor or the Mathematics Help Room as they are free for KU students.

Group Work and Tutors: Students may discuss groupwork and homework problems in groups, but each student is responsible for doing their own work and for turning in individual solutions. When a student works with a tutor, it is the responsibility of both the student and the tutor to ensure that it is the student who works to arrive at the solution of the problems. Tutors should not do student homework or provide solutions for assignments. No late homework assignment will be accepted. Members of the class are encouraged to study together, but **EACH** must write out their own solutions to the assigned problems. Copying of another person's homework is not allowed.

HOMEWORK IS A MAJOR PART OF THE LEARNING PROCESS IN MATHEMATICS, and it is essential that students work their own problems and do the groupwork and homework on a regular basis.

Withdrawal Dates

9/16 Monday Last day to drop and not have it appear on your transcript.

11/20 Monday Last day to drop and your transcript will show a "W."

Keys to Success in MATH 104

- Come to class prepared to learn and engage with the material!
- Prepare for the next class meeting:
 - Visit Blackboard to check the schedule and announcements.
 - Read the upcoming section in the textbook and take notes.
 - Complete the WarmUp questions on blackboard for extra credit.
 - Watch videos that are provided within WebAssign.
 - The online textbook has many videos within the lecture. Take advantage of those.
- Stay engaged in classroom. Participate the group activity and get help from your instructor.
- After each class, review the material and do the assigned and suggested homework on WebAssign and in the textbook.
- Find help! Take advantage of your instructor's office hours. Visit the Calculus Help Room in Snow 651! The help room schedule can be found in the course Blackboard.
- Study! Gather a group of friends and regularly work and study together.

Policy on Students with Special Needs

The KU Office of Student Access Services - AAAC coordinates accommodations and services for all eligible students with disabilities. If you have a disability and wish to request accommodations and have not contacted the AAAC should do so as soon as possible. Their office is located in 22 Strong Hall; their phone number is 785-864-4064 (V/TTY). Information about their services can be found at <http://access.ku.edu/>. Please also contact your instructor and graduate teaching assistant privately in regards with your needs in this course.

Policy on Academic Misconduct

You are required to abide by all KU policies on academic integrity. Cheating, plagiarism or other academic misconduct will result in a failing grade on the assignment in question, notification of the student's dean, and usually further disciplinary sanctions, possibly including a failing grade in the course.

You are encouraged to collaborate with other students on the homework assignments. However, each student must write up his or her own solutions and acknowledge all collaborators. Copying someone else's homework, or allowing someone else to copy yours, is considered to be a form of cheating. For more information, see KU's official policies on academic misconduct at <http://policy.ku.edu/governance/USRR#art2sect6>.

General Comments

Regular class attendance is important for success in this course. Even if you've taken a previous Calculus course, this course is likely to be taught from a more sophisticated perspective, and if you think this class will be review, you are probably mistaken.

You should expect to spend **at least two hours studying outside of class for every hour spent in class.** In contrast to most high school math classes, if you don't understand the material being covered, you should **NOT** assume that your instructor will repeat material until you understand or master it. Ideally, you should ask questions at the time in class. Of course, you'll also probably need to spend time thinking things through on your own, but if you've tried that and are still confused, make use of the Calculus Help Room and instructor office hours. **Don't wait!** The material in this course is cumulative, so anything you don't understand now is likely to keep giving you trouble as the semester goes on.

Firearms in MATH 104

Individuals who choose to carry concealed handguns are solely responsible to do so in a safe and secure manner in strict conformity with [state and federal laws](#) and [KU weapons policy](#). Safety measures outlined in the KU weapons policy specify that a concealed handgun:

- Must be under the constant control of the carrier.
- Must be out of view, concealed either on the body of the carrier, or backpack, purse, or bag that remains under the carrier's custody and control.
- Must be in a holster that covers the trigger area and secures any external hammer in an un-cocked position
- Must have the safety in on position and have no round in the chamber.

Intellectual Property

- Course materials prepared by the instructor, together with the content of all lectures and review sessions presented by the instructor are the property of the instructor.
- Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited.
- Permission to make such recordings may be granted by the instructor on a case-by-case basis, on the condition that the individual making the recording uses these recordings only as a study aid.

- Unless explicit permission is obtained from the instructor, recordings of lectures and review sessions and course content may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.