

UAF & DMS SYLLABUS GUIDELINES FOR MATH156X - PRECALCULUS

Across all sections of Precalculus offered by UAF campuses (delivered in person or online), all syllabi must satisfy the following requirements.

1. General guidelines set by UAF; follow this link to the [UAF syllabus requirements](#)

2. Content

- *Precalculus*, 7th edition by Barnett, Ziegler, Byleen and Sobecki is the textbook adopted by DMS and must be used for this course.
- This is a mastery based course that uses the ALEKS software. Students must assess to at least 85% on the ALEKS final assessment
- All of the required (r) sections from the textbook listed below must be covered. Optional (o) topics should be considered as time permits.
 - Chapter R: R.1-R.4 (r)
 - Chapter 1: 1.1-1.3, 1.5-1.6 (r), 1.4 (o)
 - Chapter 2: 2.1-2.4 (r), (exclude linear regression in 2.4)
 - Chapter 3: 3.1-3.6 (r), (quadratic regression optional in 3.4)
 - Chapter 4: 4.1-4.4 (r), 4.5 (o)
 - Chapter 5: 5.1-5.5 (r)
 - Chapter 6: 6.1-6.6 (r)
 - Chapter 7: 7.1-7.3, 7.5 (r), 7.4 (o)
 - Chapter 8: 8.1-8.2 (r)
 - Chapter 10: 10.1, 10.6 (r)

Review of relevant algebra and geometry material is strongly recommended.

3. Types of Assessments

- Exams
 - at least three exams during the semester
 - exams must be timed, proctored, closed book, closed notes and no calculators
 - exams must be majority written answer (not multiple choice)
 - exams must be paper-and-pencil exams, written and graded by faculty members
 - exams should not be reused from previous semesters, limited reuse of edited problems is acceptable
 - students who score less than 85% on an exam are required to retake a similar exam
- Final Exam
 - must be cumulative and representative of the entire course
 - any optional section that you choose to cover should not be on the final exam
 - must include problems from each Assessment Criteria listed on the next page
 - Students are expected to know on their own (no formulas provided on the test for the following):
 - * quadratic formula
 - * Pythagorean identities
 - * basic trig identities
- Other Assessed Work
 - instructors should provide written feedback to students approximately weekly throughout the semester. This can be through humanly-graded assignments or email correspondence

4. Grading Policy

- The syllabus must include a grading scale of some form.
- Plus/minus grading is at the discretion of the instructor, but must be stated explicitly.
- The final grade in this course must adhere to the following:

Written Assessed Work	At least 15% and at most 30%
Online Assessed Work	At most 15%
Midterm Exams	At least 40%
Comprehensive Final Exam	At least 20%

Assesment Criteria

Final exams should contain problems that demonstrate the students' acquired knowledge of the following topics.

- Functions
 - evaluate a function at a given point
 - express with proper notation
 - find the domain and range
- Graphs
 - find domain and range
 - find intercepts
 - identify intervals where the function is increasing or decreasing
- Be able to find the average rate of change of a function
- Transformations of Functions
- Combinations of Functions
- Inverse Functions
 - find domain and range
 - find the equation of an inverse
 - graph an inverse function
- Quadratic Functions
 - graph a quadratic given an equation
 - identify the max/min value
 - modeling with quadratics
- Polynomial Functions
 - graph by finding zeros and identifying end behavior
 - identify the equation from a graph
 - use division to divide two polynomials
 - graph a rational function by identifying intercepts and asymptotes
- Exponential Functions
 - graph a transformed exponential function
 - identify the equation of a graph of an exponential function
- Logarithmic Functions
 - graph a transformed logarithmic function
 - use laws of logarithms to evaluate, combine or expand logarithmic expressions
- Exponential and Logarithmic Equations
 - solve various types of exponential and logarithmic equations algebraically
 - modeling with exponential functions
- Systems of Equations
 - solve a system of linear equations in 2 or 3 variables
 - solve a system of non-linear equations

- Trigonometric Functions

- find values of trig functions at common angles
- graph trig functions and be able to state
 - * domain
 - * range
 - * intercepts
 - * amplitude
 - * phase shift
- definition of trig functions
- identities
 - * definition of the trig functions
 - * periodic properties
 - * cofunction identities
 - * addition and subtraction formulas
 - * double and half angle formulas (sine and cosine)
- inverse trig functions
 - * evaluating inverse trigonometric functions
 - * evaluating composition of trigonometric and inverse trigonometric functions
- trig equations and inequalities
 - * linear trigonometric equation with argument cx , $c \neq 1$
 - * equations involving either a quadratic, factoring and/or requiring the use of identities
 - * basic inequality e.g. $2 \cos x - 1 \geq 0$
- applications
 - * right angle trig (such as angle of elevation/depression)
 - * laws of sines and cosines

Final exams will be evaluated by the Core Assessment Committee based on the described desired outcomes for the course. Six questions on the exam corresponding to six of the bulleted points above will be chosen for closer review. The overall content of the exam and students' ability to write proper mathematics will also be assessed.