UAF & DMS SYLLABUS GUIDELINES FOR MATH152X – TRIGONOMETRY

Across all sections of Trigonometry 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 UAF syllabus requirements
2. Content
   - *Precalculus* by Stewart, Redlin, and Watson, 7th edition is the textbook adopted by DMS and must be used for the course.
   - All of the required (r) sections from the textbook listed below must be covered. Optional (o) topics should be considered as time permits.
     - Chapter 5: 5.1-5.5 (r), 5.6 (o)
     - Chapter 6: 6.1-6.6 (r)
     - Chapter 7: 7.1-7.5 (r)
     - Chapter 8: 8.1 (r), 8.2 (o), 8.3 (o)

     In addition, you need to incorporate a section on solving trigonometric inequalities. If you would like a list of suggested problems, you may request a PDF on this topic by contacting DMS.
   - Review of relevant precalculus material (equation solving, graphing) is strongly recommended.
3. Types of assessments
   - Exams
     - at least two midterm 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 pencil-and-paper exams, written and graded by a faculty member
     - exams should not be reused from previous semesters, limited reuse of edited problems is acceptable
   - Final exam
     - must be cumulative and representative of the entire course
     - any optional (o) section that you choose to cover should not be on the final exam
     - must include problems from each of the Assessment Criteria listed on the next page
     - students are expected to know on their own (no formulas provided on test for the following):
       - definition of all trigonometric functions
       - periodic properties ($\cos(x + 2\pi)$, etc.) and negative angle formulas ($\cos(-x)$, etc.)
       - cofunction identities ($\cos(\frac{\pi}{2} - x)$, etc.)
       - addition and subtraction formulas for sine and cosine ($\sin(a + b)$, etc.)
       - double-angle and half-angle formulas for sine and cosine
   - 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
     - students must have a mechanism for estimating their current grade in the course
     - there must be human feedback prior to the first exam
4. Grading Policy
   - The syllabus must include a grading scale in 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%

Assessment criteria

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

- Angle measures; mostly radians but some degrees; unit circle representation.
- Values of trigonometric functions of the common angles; including basic equation solving e.g. $\sin x = \sqrt{3}/2$.
- Graphs of the trigonometric functions – including domain, range, symmetry, intercepts, amplitude, phase shift.
- Definition of the trigonometric functions; for example, find all associated trigonometric functions given a point's coordinates or given $\sin\theta = 3/5$ and a quadrant.
- Identities; verifying identities. As stated on the front page, the following formulas may not be provided to the students on the final exam:
  - definition of all trigonometric functions
  - periodic properties ($\cos(x + 2\pi)$, etc.) and negative angle formulas ($\cos(-x)$, etc.)
  - cofunction identities ($\cos(\frac{\pi}{2} - x)$, etc.)
  - addition and subtraction formulas for sine and cosine ($\sin(a + b)$, etc.)
  - double-angle and half-angle formulas for sine and cosine
- Inverse trigonometric functions. Problems from each of:
  - evaluating inverse trigonometric functions
  - evaluating composition of trigonometric and inverse trigonometric functions (both orders)
  - domain and properties of the graphs of inverse trigonometric functions (full graphing ability is only expected for $\arctan x$)
- Trigonometric equations and inequalities. Include both general and specific solution sets; solutions should include both common angles and inverse trigonometric notation. Problems at least from each of:
  - 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. $2\cos x - 1 \geq 0$
- Polar coordinates; conversion of points and equations.
- Applications. Include problems from each of the following:
  - right angle trigonometry – including angle of elevation/depression
  - laws of sine and cosine; for example, navigation, bearing, etc.
  - arc length, area of sector, or linear/angular velocity