Math 111 Instructor Syllabus 2010-2011

Text: *Precalculus for the University of Oregon* (custom edition of *Precalculus: A Prelude To Calculus), by Sheldon Axler.*
Calculator: *If you require a graphing calculator,* **use it** *and recommend* a TI-84, TI-83 Plus or TI-83. *If you do not allow the use of a calculator, be prepared to a) not use one yourself (lest ye be accused of hypocrisy) and b) write exams so that the simplification of arithmetically complex problems does not overshadow the actual concept they are being tested on.*

Notes:

- *It is extremely important that the students know that Math 111 is a precalculus course. It is designed for students who have a basic algebraic understanding that is to be built upon in order to prepare them for calculus. Not all students fit this description, but nevertheless it is the assumption.*

WEEK	SECTIONS TO COVER		Notes
1	1.1, 1.2	**1.1**	Spend a lot of time (3+ lectures) on this, integrating review problems into the definition of and notation for functions, e.g. with solving linear/absolute value equations, simplification of rational expressions (see sample 1.1 handout)
	Readiness Quiz Wed!	**1.2**	Include intervals on which a function is increasing/decreasing/constant
2	1.2, 1.3	**1.3**	Work vertical/horizontal shifts/stretches/reflections, make sure they know how to combine transformations
3	1.4, 1.5, 1.6	**1.5**	Stress domain/range of inverses
		1.6	Revisit monotonicity as sufficient for a function being one-to-one
(Winter) *Martin Luther King Jr. Day Monday*			
4	2.1, 2.2	**2.1**	Focus on lines from the linear function perspective, treat slope-intercept and point- slope forms as review, but do a handful of examples, including parallel/perpendicular
	Review for Midterm	**2.2**	Review completing the square for vertex form and compare to graph transformations; you may incorporate example(s) of quadratic function applications (dropping/throwing objects, revenue/profit, etc.)
	Midterm 1		1st midterm (Chapter 1 exam) on Friday
5	2.3, 2.4	**2.3**	Discuss graphs of $y = x^3$ and $y = x^4$ as prototypes for polynomial graphs, as well as $y = \frac{1}{x}$ and $y = \frac{1}{x^2}$ as prototypical rational functions
		2.4	Stress algebraic manipulation of polynomials/polynomial functions
		2.5	Choose carefully how in depth you discuss asymptotes/holes. The book focuses on the algebra of rational functions and a calculus course will be able to address asymptotes more thoroughly.
6	2.5, 3.1	**3.1**	Introduce exponential functions from an evaluative perspective (e.g. given $f(x) = 4^x$, find and simplify $f(-3/2)$).
7	3.2	**3.2**	Discuss basic qualities (domain/range, intercepts, etc.) of both exponential and logarithmic functions; explore both categories of functions with transformations

Review for Midterm, *Midterm 2*		2nd midterm (Chapter 2 exam) on Friday Have exam grades available by Sunday before the drop deadline
8	3.3, 3.4	**3.4** If you have not covered 4.2 at this point, do not yet use *e* (thus no examples with natural log or continuously compounded interest)
9	3.5, 4.2	**3.5** Students learn exponential functions best from applications, so begin with accessible examples (folding paper in half, grains of rice on the chessboard, etc.) **4.2** You may choose to cover this section in conjunction with **3.2**. Regardless, avoid getting tied up in technical definitions of *e*, the most accessible approach is likely continuously compounded interest
(Fall) *Thanksgiving holiday Thursday/Friday.*		
10	4.4	**4.4** You may choose to cover this section in conjunction with **3.4/3.5**
Catch-up, review (Spring) *Memorial Day holiday Monday*		
11	**Final exam during scheduled time (registrar.uoregon.edu/common/cals/finalscal.htm)**	

Common areas of difficulty: Basic algebra (factoring, simplifying and operations on fractions), horizontal transformations, completing the square, applications of any sort. Be conscious of these facts when you approach each topic so that you can be ready for the confused looks, frustrated sighs, and eye rolling. Combat them with detailed examples and ample opportunities for practice. Basic algebra review is most effective when integrated into new concepts, which is why I recommend spending extra time on 1.1.

There are no sections listed as optional – it is your responsibility to your students to cover the material listed! To further that end, please use this syllabus when preparing your class lecture schedule, and keep it to refer to during the term. Ask if you have questions!

Other Important Dates (http://registrar.uoregon.edu/calendars/academic#fall2010):

Monday of 2nd week	Last day to drop without a "W" (but only 75% tuition refund)
Wednesday of 2nd week	Last day to add a class
Sunday after 7th week	Last day to drop --- period!

- **Additional information for instructors available in the Math 111 Overview**
- **Lecture handouts (like the one provided for 1.1) available from Mike Price upon request**