

MATH 12011
Calculus with Precalculus I
September 30, 2005

Text: *Calculus with Precalculus*, Custom Text consisting of
Precalculus, Mathematics for Calculus, 4th Ed., by Stewart, Redlin, and Watson, Ch. 1 – 7 and
Calculus, 5th Ed., by James Stewart, Ch. 1 – 7

MATH 12011 and MATH 12012 are three credit hour courses that together cover the same Calculus topics as MATH 12002, *Analytic Geometry and Calculus I*. In addition, each course includes review of appropriate topics from Algebra and Trigonometry as they are needed.

The outline below follows the Calculus syllabus, with sections and topics from precalculus listed where appropriate. The review sections (labeled *Precalc*) should be used only as a guide. It is not anticipated that every section will be covered in detail — these are simply the sections where the appropriate review material appears. The particular topics to be covered from each precalculus section are at the discretion of the instructor. Review topics are indicated by boldfaced type.

Algebra Review (6 classes):

Precalc: §§1.2, 1.3, 1.10, 2.1, 2.2, 2.5

Review of **equations of lines, functions and graphs, exponents, squaring and cubing of binomials**. [*Calc 0, Precalc 6*]

Limits, Continuity, Rates of Change (9 classes):

Precalc: §§1.3, 1.4

Calc: §§2.1 – 2.6

Limit of a function, limit laws. Review of **factoring, manipulation of radical and rational expressions**. Continuity, tangents, velocities, and rates of change.

[*Calc 8, Precalc 1*]

Derivatives and Trigonometry Review (12 classes):

Precalc: §§2.8, 5.1 – 5.4, 6.1 – 6.3, 7.1 – 7.3

Calc: §§3.1 – 3.3, 3.5, 3.6

Derivative of a function. Review of **sums, products, and composites of functions**. Differentiation formulas. Review of **trigonometric functions and their graphs, right triangle trigonometry, trigonometric identities**. Derivatives of trigonometric functions, chain rule. [*Calc 7, Precalc 5*]

More Derivatives and Applications (9 classes):

Precalc: §§1.5

Calc: §§3.4, 3.7 – 3.9

Review of **solving equations for a given variable**. Implicit differentiation, higher order derivatives, applications to rates of change in science and business, related rates.

[*Calc 8, Precalc 1*]

Applications of Derivatives (3 classes):

Calc: §§4.1, 4.2

Maximum and minimum values, critical numbers, Extreme Value Theorem, Mean Value Theorem. [*Calc 3, Precalc 0*]

[*Total Classes 39: Calc 26, Precalc 13*]

Exams and Reviews (3-5 classes)