

SYLLABUS

MATH 12012 –Calculus with Precalculus II

(3 Credit Hours)

Catalog Information: Development of integral calculus and continued study of differential calculus. Includes curve sketching optimization fundamental theorem of calculus areas between curves, exponential and logarithmic functions. No credit earned for this course if student earned credit for MATH 12002. Prerequisite: MATH 12011 with a minimum grade of C (2.0).

Text: Precalculus and Calculus I and II, 5th Edition, Stewart, Cengage.

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.

Applications of Derivatives, Curve Sketching and Optimization (12 classes):

- Precalc: §1.7 (and §1.3 – 1.5 if needed), §7.5 (optional)
- Calc: §§4.3 – 4.9
- Review of solving equations and non-linear inequalities by factoring, including factoring of rational expressions arising as derivatives. Increasing/decreasing functions, local maxima and minima, concavity, inflection points, review infinite limits (Calc §1.2), limits at infinity, asymptotes, curve sketching, applied optimization problems. [Calc 10, Precalc 2]

Integration (9 classes):

- Calc: §§4.10, 5.1 – 5.5
- Areas and distances, Riemann sums, the definite integral, antiderivatives, Fundamental Theorem of Calculus, indefinite integrals, integration by substitution. [Calc 9, Precalc 0]

Applications of Integrals (3 classes):

- Calc: §§5.4, 6.1, 6.5
- Net change, areas between curves, average value of a function. [Calc 3, Precalc 0]

(MATH 12012 Syllabus, continued)

Algebra and Calculus of Transcendental Functions (15 classes):

- Precalc: §§2.9, 4.1 – 4.4, 7.4
- Calc: §§7.1 – 7.5, 7.7
- Review of inverse functions, exponential and logarithmic functions. Derivatives and integrals involving exponential and logarithmic functions. Review of inverse trigonometric functions. Derivatives and integrals involving inverse trigonometric functions. Tangent lines, curve sketching, l'Hospital's rule. [Calc 11, Precalc 4]

[Total Classes 39: Calc 33, Precalc 6]

Exams and Reviews (3-5 classes)