DEPARTMENT OF MATHEMATICS AND STATISTICS
MATH 123 – CALCULUS II – COURSE OUTLINE
Effective Spring 2013

Textbooks: Essential Calculus: Early Transcendentals, 2nd edition, by James Stewart.
Supplement: Sections 9.2, 9.6, 17.1 of Calculus: Early Transcendentals, 5th edition, by James Stewart.

The outline is based on 13 weeks of lectures. This leaves approximately 2 weeks for leeway, exams, and review. The suggested times in the outline are approximate. Sections that are enclosed in parentheses may be abridged or omitted.

Week	Sections	Topics
1	6.1, 6.2	Integration by parts, trig integrals, trig substitutions
2	6.3, (6.4)	Partial fractions, (computer algebra systems)
3	6.5, 6.6	Trapezoidal rule and Simpson's rule, improper integrals
4	7.2, 7.3	Volumes
5	7.4, 7.6	Arc length, work, (hydrostratic pressure), moments and center of mass
6	7.7, 3.4	Differential equations, separable differential equations, exponential growth and decay
7	Supplement/9.6, 17.1	1st order linear equations, 2nd order linear homogeneous equations
8	8.1, 8.2, 8.3	Sequences, series, integral test
9	8.3, 8.4	Comparison tests, alternating series, absolute convergence, ratio (and root) tests
10	8.5, 8.6	Power series
11	8.7, 8.8	Taylor and Maclaurin series, Taylor polynomials
12	9.1, 9.2	Parametric curves, tangents and areas, arc length
13	9.3, 9.4	Polar coordinates, areas and lengths in polar coordinates

The text has some sections that contain both essential and nonessential topics. In order to ensure that essential topics receive full coverage, an instructor may omit the following topics.

1. Coverage of derivations and error bounds for numerical integration methods (part of Section 6.5).
2. Comparison test for improper integrals (pp. 359-360 of Section 6.6).
3. Hydrostatic pressure and force; Theorem of Pappus (pp. 401-403, 408 of Section 7.6).
4. Direction fields; mixing problems (pp. 416-418 of Section 7.7).
5. Montonic sequences (pp. 432-434 of Section 8.1).
6. The root test (p. 462 of Section 8.4).
7. Binomial series (pp. 482, 483 of Section 8.7).
8. Multiplication and division of power series (pp. 485, 486 of Section 8.7).
9. Applications of Taylor polynomials to physics (pp. 493, 494 of Section 8.8).
10. Areas under curves defined parametrically (p. 510 of Section 9.2).
11. Tangents to polar curves; graphing polar curves with graphing devices (pp. 520-522 of Section 9.3).

Note: Mathematics Department Policy requires that a comprehensive Final Examination be given in this course.

If any questions arise concerning this course, contact the Chair of the Calculus Committee.

10/17/12