

## Math 242 – Calculus II (3)

**Course Description:** Integration techniques and applications, series and approximations, differential equations.

**Prerequisite:** A grade of C or better in Math 241 or 251 or a grade of B or better in Math 215.

**Corequisite:** Math 242L

**Text:** *Calculus, Early Vectors* by James Stewart, Brooks/Cole Publishing Company, 1999.

**Math 242L:** Ideally, the students of any given section of Math 242 will be in the same Math 242L section, and the Math 242 instructor will work with the TA for the corresponding Math 242L section. It is recommended that the assignments and grades for Math 242 and Math 242L be combined.

**Week 1–3, Inverse Functions:** Inverse functions (4.2), logarithms and exponentials (6.6), exponential growth and decay (4.5), differentiation rules and applications for logarithm and exponential functions (4.1) and (4.4), inverse trigonometric functions (4.6), and l'Hospital's rule (4.8). The section on hyperbolic functions (4.7) can be cut short.

**Week 4–7, Techniques of Integration.** Integration by parts (8.1), trigonometric integrals (8.2), trigonometric substitution (8.3), rational functions and partial fractions (8.4), rationalizing substitutions (8.5), strategy for integration (8.6), and improper integrals (8.9).

It is not necessary to cover all the techniques of integration in Sections 8.2–8.4 in detail, but the students should gain some facility at integration. Section 8.7 (use to integral tables and computer algebra systems) and Section 8.8 (numerical methods) can be delegated to Math 242L.

**Week 8–12, Infinite sequences and series.** Convergence of infinite sequences and series, power series, Taylor and MacLaurin series (Chapter 10). The book's treatment of the remainder estimate for Taylor series is brief and should be expanded.

**Week 13–15, Differential equations.** First order separable and linear differential equations (9.1 and 9.2) and second order linear differential equations with constant coefficients (15.1–15.3). It is desirable to cover series solutions of differential equations (15.4).

Review.