

Mathematics 2332 – Calculus II

Student Learning Outcomes

- 1. The students will demonstrate factual knowledge including the mathematical notation and terminology used in this course.** Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in Calculus II as they pertain to integrals, parametric equations, and polar coordinates.
- 2. The students will describe the fundamental principles including the laws and theorems arising from the concepts covered in this course.** Students will identify and apply the laws and formulas that result directly from the definitions; for example, integral formulas and integration techniques, and applying calculus operations to parametric and polar equations.
- 3. The students will apply course material along with techniques and procedures covered in this course to solve problems.** Students will use the facts, formulas, and techniques learned in this course to calculate areas, volumes, and surface areas; to find lengths of curves; to analyze problems in physics.
- 4. The students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields.** Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring Calculus II as a prerequisite, or for work in occupational fields requiring a background in Calculus II. These fields might include computer science, engineering, the physical and natural sciences as well as mathematics.

Course Content

Textbook: *Calculus: Early Transcendentals*, Sixth Edition, by James Stewart. The following chapters are covered. (See textbook "Contents")

- 5. Integrals.** Areas, the definition of the definite integral, the Fundamental Theorem of Calculus, indefinite integrals, substitution.
- 6. Applications of Integration.** Areas, volumes, work, average values of functions.
- 7. Techniques of Integration.** Integration by parts, trigonometric integrals, trigonometric substitution, integration by partial fractions, improper integrals.
- 8. Further Applications of Integration.** Arc length, surface area.
- 10. Parametric Equations and Polar Coordinates.** Parametric equations: definition, tangents and areas, arc length and surface area; polar equations: definition, areas, and length.