**Math 2414 – Calculus II**

**Calculus: Early Transcendentals, 8th ed.**

Alternate Edition with EWA, James Stewart

Brooks Cole; 8th edition;

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**Course Description:**

4 Credits (4 hrs. lec., 1 hr. lab.) Differentiation and integration of exponential and logarithmic functions, techniques of integration, applications of the definite integral, the calculus of transcendental functions, parametric equations, polar coordinates, indeterminate forms and L’Hopital’s Rule, improper integrals, sequences and series. (2701016019) Prerequisite: College Level Readiness in Reading AND Writing [MATH 2413](http://catalog.lonestar.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=22&expand=&navoid=8470&search_database=Filter#tt8447)

**Course Learning Outcomes:**

The student will:

* Use the concepts of definite integrals to solve problems involving area, volume, work, and other physical applications.
* Use substitution, integration by parts, trigonometric substitution, partial fractions, and tables of anti-derivatives to evaluate definite and indefinite integrals.
* Define an improper integral.
* Apply the concepts of limits, convergence, and divergence to evaluate some classes of improper integrals.
* Determine convergence or divergence of sequences and series.
* Use Taylor and MacLaurin series to represent functions.
* Use Taylor or MacLaurin series to integrate functions not integrable by conventional methods.
* Use the concept of parametric equations and polar coordinates to find areas, lengths of curves, and representations of conic sections.
* Apply L'hôpital's Rule to evaluate limits of indeterminate forms.

**Book Sections:**

**Chapter 4**

4.4 Indeterminate Forms

**Chapter 5**

5.5 The Substitution Rule

**Chapter 6**

6.1 Areas between Curves

6.2 Volumes

6.3 Volumes by Cylindrical Shells

6.4 Work

**Chapter 7**

7.1 Integration by Parts

7.2 Trigonometric Integrals

7.3 Trigonometric Substitution

7.4 Integration of Rational Functions by Partial Fractions

7.5 Strategy for Integration

7.7 Approximate Integration

7.8 Improper Integrals

**Chapter 10**

10.1 Curves Defined by Parametric Equations

10.2 Calculus with Parametric Curves

10.3 Polar Coordinates

10.4 Areas and Lengths in Polar Coordinates

**Chapter 11**

11.1 Sequences

11.2 Series

11.3 The Integral Test and Estimates of Sums

11.4 The Comparison Tests

11.5 Alternating Series

11.6 Absolute Convergence and the Ratio and Root Tests

11.7 Strategy for Testing Series

11.8 Power Series

11.9 Representations of functions as Power Series

11.10 Taylor and Maclaurin Series

11.11 Applications of Taylor Polynomials