UAF MATH252X – CALCULUS II

Prerequisites:

Placement into MATH252X is through credit for MATH251X with a grade of C- or better, or through AP or CLEP exams.

Textbook and Course Content:

Sections of Calculus II offered by UAF campuses (in-person, hybrid, or online) use the textbook *Calculus: Early Transcendentals* by James Stewart, 8th edition, available in Single Variable or Single+Multivariable versions.

Unmarked topics below are taught in all sections. Sections marked with (o) are optional, and may be covered if time permits.

Chapter 6: Applications of Integration

6.1 Areas Between Curves
6.2 Volumes
6.3 Volumes by Cylindrical Shells
6.4 Work
6.5 Average Value of a Function

Chapter 7: Techniques of Integration

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
7.6 Integration using Tables and Computer Algebra Systems (o)
7.7 Approximate Integration
7.8 Improper Integrals

Chapter 8: Further Applications of Integration

8.1 Arc Length
8.2 Area of a Surface of Revolution
8.3 Applications to Physics and Engineering
8.4 Applications to Economics and Biology (o)
8.5 Probability (o)

Chapter 9: Differential Equations — material in Math 302 Differential Equations

Chapter 10: Parametric Equations and Polar Coordinates

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
10.5 Conic Sections — not covered
10.6 Conic Sections in Polar Coordinates — not covered

Chapter 11: Infinite Sequences and Series

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

Assessments and Grading

Individual instructors may choose to structure their courses within the following guidelines:

Exams: At least two proctored Midterm Exams will be given during the semester, in addition to a cumulative Final Exam. These will be closed book/classnotes. Calculators are not allowed on exams, but questions will not emphasize aspects of problems for which they would be useful. The majority of questions require free responses, and will be graded by course instructors. Exams will not be reused from previous semesters, so that they may be provided to students as study materials.

Other Assessed Work: While on-line homework systems are generally used, courses will include regular assessment through written work graded by an instructor or teaching assistant. Possible forms might include quizzes, written homework problems, worksheets, etc. Instructors may choose to assess oral work. Feedback to students will be given on a roughly weekly basis.

The final grade in this course will be determined by weighting assessments within the following ranges:

Written Assessed Work	At least 15% and at most 30%
Online Assessed Work	At most 15%
Midterm Exams	At least 40%
Comprehensive Final Exam	At least 20%

Instructors may use +/- grading for the course at their discretion.