

Department of Mathematics | School of Science
Calculus II | Short Syllabus

Course name and code: Calculus II (0301102).

Credit hours: 3 hrs. **Prerequisite:** Calculus I (0301101).

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Course Description: Techniques of integration: Integration by substitution, integration by parts, integrating powers of trigonometric functions, trigonometric substitutions, integrating rational functions, partial fractions, rationalization, miscellaneous substitution, improper integrals; Application of definite integral: Volumes, length of a plane curve, area of a surface of revolution; Polar coordinates and parametric equations: Polar coordinates, graphs in polar coordinates, area in polar coordinates; Infinite series: Sequences, infinite series, convergence tests, absolute convergence, conditional convergence, alternating series, power series, Taylor and Maclaurin series, differentiation and integration of power series.

Tests and evaluations: The final grade is calculated as follows:

Exams		
Midterm Exam (30 %)	Second Exam (20 %)	Final Exam (50 %)

Contents and schedule: The following is a rough plan. As the course progresses, I may include new topics and/or delete some of the ones listed here.

Topics	Sections	Weeks
a) Integration by Parts.	7.1	1-3
b) Trigonometric Integrals.	7.2	
c) Trigonometric Substitutions.	7.3	
d) Integration of by Partial Fractions. Special Substitutions.	7.4	
e) Strategy for Integration.	7.5	
f) Improper Integrals.	7.8	
g) Areas.	6.1	4-5
h) Volumes.	6.2	
i) Volumes by Cylindrical Shells.	6.3	
j) Arc Length.	8.1	5-8
k) Area of a Surface of Revolution.	8.2	
l) Sequences.	11.1	9-12
m) Series.	11.2	
n) Integral Test.	11.3	
o) Comparison Test and Limit Comparison Test.	11.4	
p) Alternating Series.	11.5	
q) Ratio and Root Tests and Absolute Convergence.	11.6	
r) Strategy for Testing Series.	11.7	
s) Power Series.	11.8	
t) Representation of Functions as Power Series.	11.9	
u) Taylor and Maclaurin Series.	11.10	
v) Polar Coordinates.	10.3	13-15
w) Areas in Polar Coordinates.	10.4	

Textbook: *Calculus: Early Transcendentals*, 8th Edn, by James Stewart.