

COURSE OUTLINE

<u>MAT152</u>		<u>Calculus II</u>		<u>4</u>
Course Number		Course Title		Credits
<u>4/Week</u>	<u>0/Week</u>	<u>0/Week</u>	<u>0/Week</u>	<u>15 Weeks</u>
Class or	Laboratory	Laboratory, Shop	Work	Semester
Lecture	Work Hours	Studio or Clinic	Experience	Length
<u>Not Applicable</u>			<u>Not Applicable</u>	
Performance on An Examination/Demonstration			Telecourse	

Required Materials:

Text: See Division booklist

A graphing calculator is required. TI – 83 or TI – 86 calculators will be used by the instructor and is therefore strongly recommended for the student. Consult with your instructor as to the appropriate model. (TI – 89 and TI – 92 are not allowed)

Catalog Description:

Calculus II 4 credits

Continuation of MAT151. Topics include techniques of integration, areas, volumes, arc length, surface area, improper integrals, Simpson’s Rule, infinite sequences, MacLaurin and Taylor series, differentiation of polar and parametric equations, conic sections in rectangular and polar form, and rotation of axes. 4 lecture hours

Latest Review: Spring 2006

Prerequisites: MAT151 with minimum C grade or appropriate College Level math placement test score and consultation with mathematics faculty member.

Co-requisites: None

Course Coordinators: Edith Silver and Betty Cornelius

UNIT I (Chapter 7) Applications of the Definite Integral (8 lecture hours)

(Sections on work, fluid pressure, and force are optional.)

At the conclusion of this unit the student should be able to:

1. Find the area bounded by several functions using x or y as the independent variable of integration.
2. Find the volume generated by revolving an area bounded by several functions about the x axis or y axis by using the disk-washer or cylindrical shells methods.
3. Use integrals to find the length of a plane curve.
4. Use integrals to find the surface of revolution.
5. Define the hyperbolic functions and their inverses.
6. Find derivatives and integrals involving the hyperbolic functions and their inverses.

UNIT II (Chapter 8) Principles of Integral Evaluation (14 lecture hours)

At the conclusion of this unit the student should be able to

1. Apply the appropriate integration formulas previously presented in this course.
2. Recognize when to use and perform integration by parts as many times as needed to evaluate an integral.
3. Use trigonometric identities to integrate powers of trigonometric functions.
4. Use trigonometric substitution where applicable to evaluate integrals.
5. Use partial fraction decomposition when needed to integrate rational functions.
6. Use integral tables to evaluate integrals.
7. Use the trapezoid rule or Simpson's rule to approximate definite integrals.
8. Determine whether an integral is improper, and if so, determine if it converges or diverges and be able to find what it converges to if it converges.

UNIT III (Chapter 10) Infinite Series (18 lecture hours)

Upon completion of this unit, a student should be able to:

1. Define an infinite sequence, write several of its terms, write its general term and determine whether it converges to a limit or diverges.
2. Use the difference, ratio or derivative method to determine if a sequence is eventually monotonic or neither, if sequence is bounded and if it is bounded its limit.
3. For a given infinite series determine which convergence test (divergence test, integral test, comparison test, limit comparison test, ratio test, root test, alternating series test) to use to determine absolute convergence, conditional convergence or divergence, apply the test and if possible determine the limit.
4. Write an n th degree Maclaurin or Taylor polynomial for a given function and determine the related Maclaurin or Taylor series.
5. Find the radius of convergence and interval of convergence for a given power series.
6. Use the Remainder Estimation Theorem to estimate the error in using a polynomial of n th degree to approximate a function.
7. Perform algebraic and calculus manipulations of power series.

UNIT IV (Chapter 11) Analytic Geometry in Calculus (8 lecture hours)

Upon completion of this unit, a student should be able to:

1. For given points or equations in rectangular form convert them to polar form and vice versa.
2. Graph equations and points using the polar coordinate system and polar symmetry tests.
3. Determine the polar equation for a given graph.
4. Find slopes of tangent lines, equations of tangent lines and length of parametric and polar curves.
5. Find areas of regions that are bounded by polar curves.
6. Find vertices, foci, centers, asymptotes, directrix, where applicable of conic sections given in rectangular form and use this information to solve application problems.
7. For a given polar equation of a conic section find its eccentricity, foci, the distance from the pole to the directrix or vertices in order to graph the conic section.
8. Find the polar equation of a conic section for given conditions.

Grading

Grading is up to the discretion of each individual instructor. However, the suggested systems are given below:

A.	One hourly test on each unit	75% of final grade
	Comprehensive Final Exam	25% of final grade
B.	Ten (30 min.) quizzes	50%
	Mid-Term	25%
	Final Exam	25%

It is essential that the student, throughout the semester, devote at least eight hours per week in homework effort.