

Last Day to Drop or Withdraw from Classes: (Verify Date on calendar or with Records Office)

## MATH 2110

## Calculus III

### Credit Hours

4 credit hours

### Course Description

A continuation of Calculus II. Topics include parametric equations, polar coordinates, conic sections, vectors, vector functions, partial derivatives, multiple integration, line integrals.

### Prerequisite Course(s)

MATH 1920 (Calculus II)

### Text

Briggs/Cochran. Calculus: Early Transcendentals. 1<sup>st</sup> edition. Pearson.

### Other text or materials required

Graphing calculator

### Academic Honesty

Acts of academic dishonesty are serious offences at JSCC. Suspension from the college could be the consequence for any act of dishonesty. No form of cheating will be tolerated. See the JSCC catalog for additional information.

### Prerequisite Competencies

It is expected that students have mastery of these prerequisite competencies. These topics will not be covered during class time. If assistance is needed regarding these topics, please use the services and materials provided by the Academic Assistance Center and Math Learning Center.

Competencies include but are not limited to:

- Use the definite integral to determine areas between curves, volume of solids and solve work problems
- Evaluate integrals using integration by parts, trig identities and trig substitution
- Evaluate integrals containing rational functions by partial fractions
- Approximate the value of a given integral
- Evaluate improper integrals
- Determine convergence or divergence of an improper integral
- Use integrals to calculate the length of a curve, area or surface of revolution and solve application problems
- Solve differential equations and separable differential equations
- Investigate direction fields and family of functions
- Use differential equations to determine exponential growth and decay
- Use the integral test and estimates of sums to determine convergence of an infinite series
- Use the comparison tests to determine convergence of an infinite series
- Determine if alternating series converge
- Determine if a series is absolutely convergent and use the ratio and root tests
- Find the radius of convergence of the power series
- Find a power series representation for a function
- Expand a function in a Taylor Series
- Investigate applications of Maclaurin and Taylor series

## Exit Competencies:

Upon successful completion of this course, a student will demonstrate comprehension and application of the following competencies.

- Convert to and from rectangular coordinates to polar coordinates
- Graph equations in polar coordinates
- Use definite integrals to determine the area of a region and the length of a curve given in polar coordinates
- Identify conic sections from their equations in both rectangular form and polar form
- Identify key characteristics of a conic section given in rectangular or polar form
- Write equations for conic sections in rectangular form and polar form given key characteristics
- Evaluate limits, both finite and infinite, involving polynomial functions
- Use the epsilon-delta approach to prove limit statements and continuity
- Evaluate limits in indeterminate forms
- Solve problems involving vectors in 2- and 3-space
- Solve problems involving points, lines, and planes in 3-space
- Sketch cylinders, spheres, surfaces of revolutions, and quadric surfaces
- Determine derivatives and integrals of vector functions
- Determine and apply partial derivatives of functions of several variables
- Determine and apply directional derivatives
- Evaluate and apply double and triple integrals
- Evaluate line integrals

## Writing Competency

None

## Support Facilities

Most JSCC math courses are supported with tutoring during the Fall and Spring semesters. See your instructor for specific tutoring opportunities available at JSCC. These facilities are not a substitute for attending class. Math tutors are not allowed to introduce new material to a student. If a class must be missed, the student must obtain class notes from a classmate and then meet with the instructor BEFORE seeking tutoring on the missed material.

### ADA

Jackson State will make reasonable accommodations for students with documented disabilities. Students should notify their instructor and Linda Nickell, Dean of Students, in the Counseling Office, Room 139 of the Student Union Building. The contact number is 425-2616 and the email is [lnickell@jsc.edu](mailto:lnickell@jsc.edu). Instructors should be notified the first week of class. All discussions remain confidential.