

# **IT305**

## **College Mathematics III**

### **[Onsite]**

**Course Description:**

Students in this course study the concepts of limits and differential and integral calculus in the context of practical problems.

**Prerequisite(s) and/or Corequisite(s):**

Prerequisite: GE192 College Mathematics II or equivalent

**Credit hours: 4**

**Contact hours: 50 (30 Theory Hours, 20 Lab Hours)**



# STUDENT SYLLABUS

Instructor: \_\_\_\_\_

Office hours: \_\_\_\_\_

Class hours: \_\_\_\_\_

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## Major Instructional Areas

### Unit 1

#### Chapter 2: The Derivative

Motion

The limit

The slope of a tangent line to a curve

The derivative

Differentiation of polynomials

Derivatives of products and quotients

The derivative of a power (chain rule)

Implicit differentiation

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### Unit 2

#### Chapter 3: Applications of the derivative

Curve sketching and the use of derivatives

Maximums, minimums, points of inflexion

Asymptotes  
Maximum and minimum problems  
Related rates  
Differentials and linear approximations

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## **Unit 3**

### **Chapter 4: Derivatives of transcendental functions**

The trigonometric functions  
Derivatives of the sine and cosine functions  
Derivatives of other trigonometric functions  
Inverse trigonometric functions  
Derivatives of inverse trigonometric functions  
Exponential and logarithmic functions  
Derivative of logarithmic functions  
Derivative of exponential functions  
L'hospital's rule

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## **Unit 4**

### **Chapter 5: The integral**

The indefinite integral  
The constant of integration  
Area under a curve  
The definite integral (Fundamental theorem of calculus)

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## **Unit 5**

**Chapter 6: Applications of integration**

Area between curves

Volumes of revolution: disk method

Volumes of revolution: shell method

Center of mass

Moment of inertia

Work, fluid pressure and average value

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## Course Objectives

Upon successful completion of this course, the student should be able to:

1. Differentiate algebraic and transcendental functions using the basic derivative rules.
2. Integrate algebraic and transcendental functions using the basic integration rules.
3. Solve application problems involving derivatives.
4. Solve application problems involving integrals

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## Teaching Strategies

Curriculum is designed to promote a variety of teaching strategies that support the outcomes described in the course objectives and that foster higher cognitive skills. Delivery makes use of various media and delivery tools in the classrooms.

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## Student Textbook and Materials

Text: Ewen, Dale, et.al. Introductory Calculus, 5<sup>th</sup> ed., Prentice-Hall, 2005.

### Web References

- <http://library.itt-tech.edu>: Log on to the virtual library to access online books, journals, and other reference resources selected to support ITT Tech curricula
- go to [www.prenhall.com/ewen](http://www.prenhall.com/ewen) for self-grading practice quizzes

## Course Outline

Unit	Topic (Lecture Period)	Chapters	Lab and Other Coverage
1	Derivatives	2	additional instructor-assigned exercises
2	Applications of derivatives	3	additional instructor-assigned exercises
3	Derivatives of transcendental functions	4	additional instructor-assigned exercises
4	The integral	5	additional instructor-assigned exercises
5	Applications of integration	6	additional instructor-assigned exercises
6	Review and Final Examination	.	The final examination will be based on the content covered in chapters 2-6

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## Evaluation Criteria and Grade Weights

- Homework      25%
  - Exam 1        15%
  - Exam 2        15%
  - Class exercises 25%
  - Final exam    20%
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Final grades will be calculated from the percentages earned in class as follows:

A      90 - 100%    4.0

B+	85 - 89%	3.5
B	80 - 84%	3.0
C+	75 - 79%	2.5
C	70 - 74%	2.0
D+	65 - 69%	1.5
D	60 - 64%	1.0
F	<60%	0.0