

# **EG360T**

## **Introductory Calculus**

### **[Onsite]**

**Course Description:**

This course is an introduction to differential and integral calculus. This course will include, but is not limited to, the following concepts: limits, derivatives, antiderivatives and antidifferentiation, and both indefinite and definite integrals.

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

Prerequisites: GE192T College Mathematics II or equivalent

**Credit hours: 4**

**Contact hours: 48 (48 Theory 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

## 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.

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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 |

Introductory Calculus

Syllabus

|    |          |     |
|----|----------|-----|
| C  | 70 - 74% | 2.0 |
| D+ | 65 - 69% | 1.5 |
| D  | 60 - 64% | 1.0 |
| F  | <60%     | 0.0 |