

Piedmont Technical College Course Syllabus

COURSE INFORMATION

Course Prefix/Number: MAT 240

Title: Analytical Geometry and Calculus III

Responsible Division: Arts and Sciences

Last Day to Withdraw from this Course: For the last date to withdraw from this course, consult the current *Student Calendar*.

Course Description:

For course, credit hour, pre-requisite(s) and co-requisite(s) information, visit the Detailed Course Information page: www.ptc.edu/courses/MAT240.

Textbook and Other Materials:

For textbook information and additional required and/or supplemental materials, visit the [college bookstore](http://www.ptc.edu/bookstore) (www.ptc.edu/bookstore).

Proctored Examinations:

Proctored examinations for distance learning courses taken at non-PTC campuses may require a proctoring fee for each exam taken.

COURSE POLICIES

Course policies are available online through the *Academic Catalog* and *Student Handbook*. Visit the [Course Policies page](http://www.ptc.edu/syllabus/policies) (www.ptc.edu/syllabus/policies) for a detailed list of important policies and more information.

GRADE POLICY

Detailed grading policy information can be found on the [Grading Policy webpage](http://www.ptc.edu/grading-policy) (http://www.ptc.edu/grading-policy). Final grade appeal information is available in the [Academic Catalog](http://www.ptc.edu/catalog/) (http://www.ptc.edu/catalog/).

ACCOMMODATIONS

Accommodations for ADA:

Information is available on the [Student Disability Services webpage](http://www.ptc.edu/ada) (<http://www.ptc.edu/ada>).

TITLE IX HARASSMENT AND SEXUAL ASSAULT INFORMATION

In accordance with Title IX of the Education Amendments of 1972, Piedmont Technical College does not discriminate on the basis of sex in its education programs or activities. Title IX protects students, employees, and applicants from sex discrimination in admissions and employment to include discrimination based on gender identity or failure to conform to stereotypical notions of masculinity or femininity. More information regarding Title IX, including contact information for the Title IX coordinators, is available at [Title IX Harassment and Sexual Assault Information](https://www.ptc.edu/about/legal-disclosures/title-ix-harassment-and-sexual-assault-information) (<https://www.ptc.edu/about/legal-disclosures/title-ix-harassment-and-sexual-assault-information>).

RATIONALE

Why do I need this course?

MAT 240 provides a strong background in the techniques of multivariable and vector calculus for not only further study in mathematics but also for advanced coursework in engineering and the physical sciences.

PROGRAM INFORMATION

For program information including required courses, program learning outcomes, gainful employment information and advisement information, refer to the Academic Program webpage. Go to [Academics](http://www.ptc.edu/academics) (<http://www.ptc.edu/academics>), select your program, and then select Credentials Offered.

COURSE STUDENT LEARNING OUTCOMES

Upon successful completion of this course and/or clinical, each student will be able to:

- Differentiate and integrate exponential, logarithmic, inverse trigonometric and hyperbolic functions and combinations and compositions thereof.
- Apply integration (including numerical techniques) to solving problems involving areas, volumes, fluid pressure, work, and moments and centroids.
- Integrate using substitution, integration by parts, trigonometric substitution, in Represent vectors analytically and geometrically, and compute dot and cross products for presentations of lines and planes.
- Analyze vector functions to find derivatives, tangent lines, integrals, arc length, and curvature.
- Compute limits and derivatives of functions of 2 and 3 variables.
- Apply derivative concepts to find tangent lines to level curves and to solve optimization problems.
- Evaluate double and triple integrals for area and volume.
- Differentiate vector fields.
- Determine gradient vector fields and find potential functions.
- Evaluate line integrals directly and by the fundamental theorem.
- Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of multivariable calculus concepts.

GENERAL EDUCATION COMPETENCIES

Piedmont Technical College General Education Competencies for All Graduates:

This course may address one or more of the following General Education Competencies (assessment will be stated when applicable):

Communicate effectively.

Assessment:

- N/A

Apply mathematical skills appropriate to an occupation.

Assessment:

- Tests and graded homework questions.

Employ effective processes for resolving problems and making decisions.

Assessment:

- Tests and graded homework questions.

Demonstrate the basic computer skills necessary to function in a technological world.

Assessment:

- N/A

To validate proficiency in the general education competencies, students in some programs will be tested using Work Keys.