



# **INSTRUCTIONAL PACKAGE**

MAT 141

Analytical Geometry and Calculus II

Effective Term

2021 — 2022 Academic Year

# INSTRUCTIONAL PACKAGE

## Part I: Course Information

Effective Term: 2021 – 2022 Academic Year

COURSE PREFIX: MAT 141

COURSE TITLE: Analytical Geometry and Calculus II

CONTACT HOURS: 4.0

CREDIT HOURS: 4.0

### RATIONALE FOR THE COURSE:

This four-semester hour calculus course is used primarily by colleges and universities in their engineering, science and mathematics majors. The mathematics taught in this course is the basis for at least one more calculus course and is used in statistics, physics and other specialized courses in the student's major.

### COURSE DESCRIPTION:

This course includes the following topics: continuation of calculus of one variable, including analytic geometry, techniques of integration, volumes by integration, and other applications; infinite series, including Taylor series and improper integrals. (Prerequisite: Analytical Geometry and Calculus I) This course is transferable to public senior institutions as part of the South Carolina Commission on Higher Education Statewide Articulation Agreement.

### PREREQUISITES/CO-REQUISITES:

Credit level [MAT 140](#) Minimum Grade of C or Credit level [MAT 140](#) Minimum Grade of TC

\***Online/Hybrid** courses require students to complete the [DLi Orientation Video](#) prior to enrolling in an online course.

### REQUIRED MATERIALS:

1. Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.  
[BOOKSTORE](#).

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

2. Scientific/Graphing Calculator

### ENTRY LEVEL COMPETENCIES:

1. Use concepts of calculus to:
  - a. Find derivatives of algebraic, exponential, logarithmic & trigonometric functions.

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- b. Evaluate integrals of algebraic, exponential, logarithmic & trigonometric functions.
- d. Find extrema, points of inflection & use definite integrals to find areas.
- c. Apply the Fundamental Theorem of Calculus.

### **TECHNICAL REQUIREMENTS:**

Access to Desire2Learn (D2L), HGTC's student portal for course materials.  
MyHGTC and college email access.

### **STUDENT IDENTIFICATION VERIFICATION**

Students enrolled in online courses will be required to participate in a minimum of one (1) proctored assignment and/or one (1) virtual event to support student identification verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

### **CLASSROOM ETIQUETTE:**

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

**NETIQUETTE:** is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit [Online Netiquette](#).

## **Part II: Student Learning Outcomes**

### **COURSE LEARNING OUTCOMES and ASSESSMENTS\*:**

The student should be able to:

1. Find the area of a region between two curves.
2. Find volumes by the disk method and by the shell method.
3. Find the arc length and the area of a surface of revolution.
4. Understand the definition of work and find work done.
5. Understand the definition of mass and find the center of mass.
6. Use integration by parts, partial fractions & trigonometric substitution to evaluate integrals.
7. Evaluate trigonometric integrals.
8. Identify improper integrals and evaluate them.
9. Define sequences, series and understand convergence and divergence.

10. Use the various tests to determine when an infinite series converges or diverges.
11. Find Taylor and Maclaurin polynomial approximations of functions.
12. Understand power series and find the radius and interval of convergence.
13. Determine the Taylor and Maclaurin series for given functions.
14. Define the various conic sections.
15. Use parametric equations to represent plane curves.
16. Understand polar coordinates and polar graphs.
17. Find area and arc length in polar coordinates.

### **UNIT I: Applications of Integration**

Applications of Integration (Chapter 7)

1. Area of a Region between Two Curves (7.1)
2. Volume: The Disk Method (7.2)
3. Volume: The Shell Method (7.3)
4. Arc Length and Surfaces of Revolution (7.4)
5. Work (7.5)
6. Moments, Centers of Mass and Centroids (7.6)
7. \*\*Fluid Pressure and Fluid Force (7.7)

### **UNIT II: Integration Techniques and Improper Integrals**

Integration Techniques and Improper Integrals (Chapter 8)

1. Basic Integration Rules (8.1)
2. Integration by Parts (8.2)
3. Trigonometric Integrals (8.3)
4. Trigonometric Substitution (8.4)
5. Partial Fractions (8.5)
6. \*\*Integration by Tables and Other Integration Techniques (8.7)
7. Improper Integrals (8.8)

### **UNIT III: Infinite Series**

Infinite Series (Chapter 9)

1. Sequences (9.1)
2. Series and Convergence (9.2)
3. The Integral Test and p-Series (9.3)
4. Comparison of Series (9.4)
5. Alternating Series (9.5)
6. The Ratio and Root Tests (9.6)
7. Taylor Polynomials and Approximations (9.7)

8. Power Series (9.8)
9. Representation of Functions by Power Series (9.9)
10. Taylor and Maclaurin Series (9.10)

#### **UNIT IV: Conics, Parametric Equations and Polar Coordinates**

Conics, Parametric Equations and Polar Coordinates (Chapter 10)

1. Conics and Calculus (10.1)
2. Plane Curves and Parametric Equations (10.2)
3. Parametric Equations and Calculus (10.3)
4. Polar Coordinates and Polar Graphs (10.4)
5. Area and Arc Length in Polar Coordinates (10.5)

\*\*As time permits.

***\*Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

#### **EFFECTIVE PROFESSIONAL AND INTERPERSONAL COMMUNICATION (EPIC):**

This course fulfills HGTC’s Quality Enhancement Plan for Effective Professional and Interpersonal Communication. Upon completion of this course, students will be able to:

(Check all that apply.)

- Utilize appropriate communication formats when conveying professional and interpersonal thoughts and ideas.
- Apply appropriate language when speaking and writing for their chosen field of study or Industry.
- Demonstrate appropriate communication techniques when engaging audiences.

### **Part III: Grading and Assessment**

#### **EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS\***

***\*Students, for the specific number and type of evaluations, please refer to the Instructor’s Course Information Sheet.***

#### **GRADING SYSTEM:**

- A 90-100%
- B 80-89%
- C 70-79%
- D 60-69%
- F Below 60%

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Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the academic calendar for deadlines for add/drop ([ACADEMIC CALENDAR](#)). You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

## Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

**For online and hybrid courses**, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, and if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

## Part V: Student Resources



### THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. **Academic tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.
3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring, contact the SSTC at [sstc@hgtc.edu](mailto:sstc@hgtc.edu) or self-schedule in the Penji iOS/Android app or at [www.penjiapp.com](http://www.penjiapp.com). Email [sstc@hgtc.edu](mailto:sstc@hgtc.edu) or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [Online Resource Center](#) to access on-demand resources.



## **STUDENT INFORMATION CENTER: TECH Central**

TECH Central offers to all students the following free resources:

1. **Getting around HGTC:** General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. Use the [Online Resource Center \(ORC\)](#) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.
4. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.

Visit the [Tech Central](#) website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option #2.

## **STUDENT TESTING:**

Testing in an **online/hybrid** course may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms

Further more tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through our online proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

## **DISABILITY SERVICES:**

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability staff will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

## **STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:**

Horry-Georgetown Technical College prohibits discrimination and harassment, including sexual

harassment and abuse, on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation in educational programs and/or activities.

### **TITLE IX REQUIREMENTS:**

All students (as well as other persons) at Horry-Georgetown Technical College are protected by Title IX—regardless of their sex, sexual orientation, gender identity, part- or full-time status, disability, race, or national origin—in all aspects of educational programs and activities. Any student, or other member of the college community, who believes that he/she is or has been a victim of sexual harassment or sexual violence may file a report with the college’s Chief Student Services Officer, campus law enforcement, or with the college’s Title IX Coordinator, or designee.

\*Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

### **INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:**

**Student and prospective student** inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs.

**Dr. Melissa Batten, VP Student Affairs**

*Title IX Coordinator*

Building 1100, Room 107A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5228

[Melissa.Batten@hgtc.edu](mailto:Melissa.Batten@hgtc.edu)

**Employee and applicant** inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.

**Jacquelyne Snyder, VP Human Resources**

*EEO and Title IX Coordinator*

Building 200, Room 212A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5212

[Jacquelyne.Snyder@hgtc.edu](mailto:Jacquelyne.Snyder@hgtc.edu)