



Science, Technology, Engineering, and Mathematics (STEM) Division  
1400 Tanyard Road, Sewell, NJ 08080  
856-468-5000

## **MAT 107: Pre-Calculus and Mathematical Analysis**

Syllabus

Lecture Hours/Credits: 4/4

### **Catalog Description**

*Prerequisite: Three years of high school Mathematics, including a semester of Trigonometry or MAT 110*

This course prepares students for the study of calculus. Topics include the algebra of functions, sequences, mathematical induction, equations of a line, slopes, angles of intersection, conic sections, logarithmic and exponential functions, a review of trigonometry, polar coordinates and an introduction to limits

### **Textbook and Course Materials**

It is the responsibility of the student to confirm with the bookstore and/or their instructor the textbook, handbook, and any other materials required for their specific course and section.

Click here to see current textbook prices at [rcgc.bncollege.com](http://rcgc.bncollege.com).

### **Evaluation Assessment**

#### **Online Proctoring**

All courses offered at RCSJ, whether they are web-enhanced, hybrid, or fully online, may include assessments that make use of Online Proctoring. To find out more about Online Proctoring, and to learn about the minimum technical requirements, visit [rcsj.edu/elearning/online-proctoring](http://rcsj.edu/elearning/online-proctoring).

### **Grading Distribution**

Grading to be determined by individual instructors.

Individual instructors may include the following assessment(s):

- Exams
- Quizzes
- Class Discussions
- Written Assignments
- Attendance and Participation

### **Grading**

The grading scale for each course and section will be determined by the instructor and distributed the first day of class.

## Rowan College of South Jersey Core Competencies

(Based on the NJCCC General Education Foundation - August 15, 2007; Revised 2011; Adopted 2014)

This comprehensive list reflects the core competencies that are essential for all RCSJ graduates; however, each program varies regarding competencies required for a specific degree. Critical thinking is embedded in all courses, while teamwork and personal skills are embedded in many courses.

1. **Written and Oral Communication:** Students will communicate effectively in both speech and writing.
2. **Quantitative Knowledge and Skills:** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems
3. **Scientific Knowledge and Reasoning:** Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.
4. **Technological Competency:** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals
5. **Society and Human Behavior:** Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.
6. **Humanistic Perspective:** Students will analyze works in the fields of art, history, music, or theater; literature; philosophy and/or religious studies; and/or will gain competence in the use of a foreign language
7. **Historical Perspective:** Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.
8. **Global and Cultural Awareness:** Students will understand the importance of a global perspective and culturally diverse peoples.
9. **Ethical Reasoning and Action:** Students will understand ethical issues and situations.
10. **Information Literacy:** Students will address an information need by locating, evaluating, and effectively using information.

### MAT 107 CORE COMPETENCIES

This course focuses on one of RCSJ's Core Competencies:

- Quantitative Knowledge and Skills

## Student Learning Outcomes: Pre-Calculus and Mathematical Analysis

Successful completion of MAT 107 will help students:	RCSJ Core Competencies	Evaluation / Assessment (Additional means of evaluation may be included by individual instructors)
Work with polynomial and rational functions effectively.	Quantitative Knowledge and Skills	Homework, Quizzes, Assignment, Exams
Apply the laws of exponential and logarithmic functions.	Quantitative Knowledge and Skills	Homework, Quizzes, Assignment, Exams
Solve applications of trigonometric equations.	Quantitative Knowledge and Skills	Homework, Quizzes, Assignment, Exams
Graph and interpret conic sections.	Quantitative Knowledge and Skills	Homework, Quizzes, Assignment, Exams
Work with geometric and arithmetic series effectively.	Quantitative Knowledge and Skills	Homework, Quizzes, Assignment, Exams
Graph linear, quadratic, exponential, logarithmic, trigonometric, polar, polynomial and rational functions.	Quantitative Knowledge and Skills	Homework, Quizzes, Assignment, Exams
Decompose rational expressions into partial fractions.	Quantitative Knowledge and Skills	Homework, Quizzes, Assignment, Exams

### Topical Outline

#### Polynomials and Rational Functions

- Quadratic Functions and Models
- Polynomial Functions and Their Graphs
- Dividing Polynomials
- Real Zeros of Polynomials
- Rational Functions

#### Exponential and Logarithmic Functions

- Exponential Functions
- The Natural Exponential Function
- Logarithmic Functions
- Laws of Logarithms
- Exponential and Logarithmic Equations

#### Trigonometric Identities and Conditional Equations

- Trigonometric Identities
- Addition and Subtraction Formulas
- Double-Angle, Half-Angle and product-Sum Formulas
- Basic Trigonometric Equations
- More Trigonometric Equations
- Partial Fractions

#### Additional Topics in Analytic Geometry

- Parabolas
- Ellipses
- Hyperbolas
- Shifted Conics

#### Sequences, Series, and Induction

- Sequences and Summations Notation
- Arithmetic Sequences
- Geometric Sequences

### **Affirmative Action Statement**

The Board of Trustees is committed to providing a work and academic environment that maintains and promotes affirmative action and equal opportunity for all employees and students without discrimination on the basis of certain enumerated and protected categories. These categories are race, creed (religion), color, national origin, nationality, ancestry, age, sex (including pregnancy and sexual harassment), marital status, domestic partnership or civil union status, affectional or sexual orientation, gender identity or expression, atypical hereditary cellular or blood trait, genetic information, liability for military service, or mental or physical disability, including AIDS and HIV related illnesses.

For questions concerning discrimination, contact Almarie J. Jones, Special Assistant to the President, Diversity and Equity/Title IX and Compliance, 856-415-2154 or [ajones@rcsj.edu](mailto:ajones@rcsj.edu) or (Cumberland) Nathaniel Alridge, Jr., JD, Director, Diversity and Equity/Title IX and Judicial Affairs, 856-691-8600, ext. 1414 or [nalridge@rcsj.edu](mailto:nalridge@rcsj.edu). For disability issues or any barriers in the learning or physical environment related to a document condition/disability please contact: Gloucester campus – Dennis M. Cook, Director, Department of Special Services, ADA/504 Officer at 856-415-2265 or [dcook@rcsj.edu](mailto:dcook@rcsj.edu); or Cumberland Campus – Meredith Vicente, Senior Director, Physical & Learning Disabilities, Center for Academic & Student Success (CASS) at 856-691-6900 ext. 1282 or [mvicent1@rcsj.edu](mailto:mvicent1@rcsj.edu)

### **Department of Special Services**

The Department of Special Services is located in the Instructional Center, room 425A. The Special Services Department is committed to providing support services and ensuring equal access to eligible students with documented disabilities as outlined by the Americans with Disabilities Act (ADA) and the Americans with Disabilities Act with Amendments. If you are an eligible student with a documented disability please visit our website at [RCSJ.edu/SpecialServices](http://RCSJ.edu/SpecialServices) or call the office at 856-415-2265 or 856-415-2247 to speak to the Assistant Director Carol Weinhardt, [cweinhar@rcsj.edu](mailto:cweinhar@rcsj.edu).

## Reporting Allegations of Sexual Assault and Resource Referrals (8/2020) Gloucester Campus

There are multiple safe places for students to report allegations of sexual assault, both on and off campus. Reports of sexual assault can be made to any of the following offices listed in the chart below.

All students are encouraged to report alleged crimes on campus. Crimes that pose a threat to the campus community must be reported to 9-1-1, Security, the Sheriff's Office or the Deptford Township Police Department. All employees, including Security staff, must report incidents of discrimination, harassment or sexual misconduct to the Title IX Officer.

Service	Resource	Phone Number/Location/Website
<b>Non-Confidential Reporting</b>  Local Law Enforcement	Gloucester County Sheriff's Office Deptford Township Police Dept. Gloucester Co. Prosecutor's Office Sexual Assault Response Team	856-681-2200 856-845-2220 856-384-5500 856-384-5555
<b>Non-Confidential Reporting 9-1-1 and Campus Security</b>	9-1-1 Gloucester County Emergency Management Dispatch  Campus Security <b>Blue Light Emergency Phones OR ext. 4444 from any campus desk phone</b>	9-1-1 or push <b>RED</b> button on Campus <b>Blue Light</b> Emergency Phones  856-681-6287
<b>Non-Confidential On-Campus Reporting Support Services</b>	Almarie J. Jones Special Assistant to the President <b>Diversity and Equity/Title IX and Compliance</b>  John F. Ryder Director <b>Student and Veteran Affairs</b>	856-415-2154 College Center, Room 116 <a href="mailto:ajones@rcsj.edu">ajones@rcsj.edu</a>  856-468-5000, ext. 6456 College Center, room 202 <a href="mailto:jryder@rcsj.edu">jryder@rcsj.edu</a>
<b>Confidential On-Campus Counseling and Support Services</b>	Lois Y. Lawson-Bridgell, Ph.D. MSW, LSW, Director <b>Counseling &amp; Wellness Services Center</b>  William Leonard, Ph.D. <b>Intervention Teams Consultant</b>  Crystal Nobao, LSW, MSW Director, The Center for <b>People in Transition (PIT)</b>  Diane Mussoline, EdS, LMFT <b>Director of Behavioral Services</b>	856-464-5236 <a href="mailto:llawsonb@rcsj.edu">llawsonb@rcsj.edu</a> College Center, Room 206  <a href="mailto:wleonard@rcsj.edu">856-415-2119 wleonard@rcsj.edu</a> <a href="#">College Center, STEM Office C-168</a>  856-415-2264 <a href="mailto:cnobao@rcsj.edu">cnobao@rcsj.edu</a> Workforce Development Bldg., room 809  856-494-5665 <a href="mailto:dmussoli@rcsj.edu">dmussoli@rcsj.edu</a> College Center, Room 200A
<b>Confidential Off-Campus Full-Service Support</b>	<b>Center for Family Services/                      Services Empowering                      Rights of Victims (SERV)</b>	1-866-295-7378 Camden and Gloucester counties <a href="http://centerffs.org/serv">centerffs.org/serv</a>
<b>Hospitals with Sexual Assault Nurse Examiners</b>	<b>Inspira Medical Center</b>  <b>Jefferson Washington                      Township Hospital</b>	700 Mullica Hill Rd. Mullica Hill, NJ · 856-508-1000  435 Hurffville-Crosskeys Rd., Turnersville, NJ · 856-582-2500