



Science, Technology, Engineering, and Mathematics (STEM) Division  
3322 College Drive, Vineland, NJ 08360  
856-691-8600

## **MA 130 Calculus I**

Syllabus

Lecture Hours/Credits: 4/4

### **Catalog Description**

*Prerequisites: MA 120 or MA 121 or placement by Accuplacer results.*

This is a rigorous calculus course, designed to prepare students for further study in the sciences, engineering, and mathematics. Topics include limits, the derivative, differentiation techniques, linearization, optimization methods, Newton's Method, anti-differentiation, Riemann Sums, the definite and indefinite integral, the area under a curve, and a variety of applications for the above. Important theorems include the Fundamental Theorem of Calculus, the Mean Value Theorem, Rolle's Theorem, and the Intermediate Value Theorem.

### **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 [cccnj.bncollege.com](http://cccnj.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):

- Class participation/Attendance
- Quizzes and lecture exams
- Final Exam
- Lab reports (incl. field trips)
- Project

## 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.

## MA 130 Core Competencies

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

- [Add Core Competencies here](#)

## Student Learning Outcomes: Calculus I

| Successful completion of MA 130 will help students:                                      | RCSJ Core Competencies | Evaluation / Assessment<br>(Additional means of evaluation may be included by individual instructors)   |
|--|------------------------|---|
| Analyze limit values for a variety of functions  |                        | <ul style="list-style-type: none"> <li>• Class participation/Attendance</li> <li>• Quizzes and lecture exams</li> <li>• Final Exam</li> <li>• Lab reports (incl. field trips)</li> <li>• Project</li> </ul> |
| Analyze the rate of change for a variety of functions                                    |                        | <ul style="list-style-type: none"> <li>• Class participation/Attendance</li> <li>• Quizzes and lecture exams</li> <li>• Final Exam</li> <li>• Lab reports (incl. field trips)</li> <li>• Project</li> </ul> |
| Model and apply the derivative to solve optimization, physics, and related rate problems |                        | <ul style="list-style-type: none"> <li>• Class participation/Attendance</li> <li>• Quizzes and lecture exams</li> <li>• Final Exam</li> <li>• Lab reports (incl. field trips)</li> <li>• Project</li> </ul> |
| Determine a function's antiderivative, and solve applications of initial value problems  |                        | <ul style="list-style-type: none"> <li>• Class participation/Attendance</li> <li>• Quizzes and lecture exams</li> <li>• Final Exam</li> <li>• Lab reports (incl. field trips)</li> <li>• Project</li> </ul> |
| Use numerical methods to approximate function values, function roots, and areas.         |                        | <ul style="list-style-type: none"> <li>• Class participation/Attendance</li> <li>• Quizzes and lecture exams</li> <li>• Final Exam</li> <li>• Lab reports (incl. field trips)</li> <li>• Project</li> </ul> |
| Evaluate definite and indefinite elementary integrals.                                   |                        | <ul style="list-style-type: none"> <li>• Class participation/Attendance</li> <li>• Quizzes and lecture exams</li> <li>• Final Exam</li> <li>• Lab reports (incl. field trips)</li> </ul>                    |

| Successful completion of MA 130 will help students: | RCSJ Core Competencies | Evaluation / Assessment<br>(Additional means of evaluation may be included by individual instructors) |
|---|------------------------|---|
|   |                        | <ul style="list-style-type: none"> <li>• Project</li> </ul>   |

## Topical Outline

- Graphing and functions
  - Graphs and their properties
  - Linear models and Rates of Change
  - Functions
  - Definition of a function and ways to represent them
  - Finding the domain and range
  - Notation and operations
- Limits and Continuity
  - Limit of a function
  - Properties of limits
  - Techniques for evaluating
  - One sided and infinite limits
  - Delta, epsilon definition of a limit
  - Continuity
  - Definition of continuity at a point
  - Theorems on continuity
- The Derivative
  - Slope of a curve at a point
  - Definition of the derivative of a function
  - Derivative formulas
  - Derivative of an implicit function
  - Higher order derivatives
  - Inverses
  - Applications of the derivative
  - Logarithmic differentiation
- Curve Sketching
  - Increasing and decreasing functions
  - Relative maxima and minima
  - First derivative test
  - Second derivative test
  - Concavity and points of inflection
  - Rolle's and Mean-value theorem
  - Maxima and Minima applications
- Related rates

- One-dimensional kinematics
- The differential and its applications
- Anti-differentiation / definite integral
  - Area under a curve
  - The Fundamental Theorem of Calculus
  - Basic integration techniques & u-substitution
  - Numerical integration
  - Applications of the integral
  - Introduction to Logarithms
  - Definition and properties of natural logarithm
  - Natural Logarithm & Integration
  - Definition and properties of natural exponential

### **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, located in the Enrollment and Student Services building, within the Testing Center, welcomes students of all abilities. The staff members in Special Services are committed to providing support services and ensuring equal access to eligible students with documented conditions/disabilities as outlined by the Americans with Disabilities Act (ADA) and the Americans with Disabilities Act with Amendments Act (ADAAA). For more information, please visit our website-[Department of Special Services](#) or call 856-691-8600 x1445 or x1487.

**Reporting Allegations of Sexual Assault Resource Referrals (8/2020)**  
**Cumberland 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. Employees must report crimes that pose an immediate threat to the campus to the Security Office, the local Police Department or the Sheriff's Office.

| <b>Service</b>  | <b>Resource</b>   | <b>Phone Number/Location/Website</b>  |
|---|---|---|
| <b>Non-Confidential Reporting</b><br><br>Law Enforcement            | Vineland Police Dept.   | 856-691-4111  |
|   | Millville Police Department   | 856-825-7010  |
|   | Cumberland Co. Sheriff's Office   | 856-451-4449  |
|   | Cumberland County Emergency Services  | <b>9-1-1</b>  |
|   | Cumberland Campus Security<br>856-200-4706 (Direct)   | Andres Lopez, Director<br>Safety and Security<br>856-691-8600, ext. 1777  |
| <b>Non-Confidential</b><br><br>On-Campus Reporting Support Services | Almarie J. Jones<br>Special Assistant to the President<br>Diversity and Equity, Title IX and Compliance | 856-415-2154<br>College Center, room116<br><a href="mailto:ajones@rcsj.edu">ajones@rcsj.edu</a>   |
|   | Nathaniel Alridge, Jr., JD, Director<br>Diversity and Equity, Title IX and Judicial Affairs             | 856-200-4712<br><a href="mailto:nalridge@rcsj.edu">nalridge@rcsj.edu</a><br>Academic Building, 2 <sup>nd</sup> floor                                      |
|   | Kellie W. Slade<br>Executive Director<br>Student Services, Student Life                                 | 856-200-4615<br><a href="mailto:kslade@rcsj.edu">kslade@rcsj.edu</a><br>Student Life Building (near gym)  |
| <b>Confidential</b><br>On-Campus Counseling and Support Services    | Heather Bense, LCSW, ACS<br>Director  | 856-200-4759<br><a href="mailto:hbense@rcsj.edu">hbense@rcsj.edu</a><br><a href="#">Academic Building downstairs</a>                                      |
|   | John Wojtowicz, LSW, VACW<br>Mental Health Counselor  | 856-200-4760<br><a href="mailto:jwojtowicz@rcsj.edu">jwojtowicz@rcsj.edu</a>  |
|   | <b>Student Counseling and Wellness Center</b>   | <b>Academic Building – 1<sup>st</sup> floor</b>   |
| <b>Confidential</b><br>Off-Campus Full-Service Support              | <b>Center for Family Services – Services Empowering Rights of Victims (SERV)</b>                        | 24/7 Hotlines<br><b>Cumberland Co. – 1-800-225-0196</b><br>Camden & Glo. Co. 1-866-295-7378<br><a href="http://centerffs.org/serv">centerffs.org/serv</a> |
| <b>Sexual Assault Nurse Examiner on Site</b>                        | <b>Inspira Medical Center<br/>Vineland</b>  | <b>1505 W. Sherman Ave., Vineland, NJ<br/>856-641-8000</b>  |