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

MA 121 Precalculus Mathematics

Syllabus

Lecture Hours/Credits: 4/4

Catalog Description

Prerequisites: MA094, high school coursework in trigonometry, and the permission of the instructor or placement by Accuplacer score

Topics include polynomial, rational, exponential, logarithmic and trigonometric functions, the complex number system, and conic sections. Precalculus is designed to prepare students for Calculus I. MA 121 is equivalent to MA 110 and MA 120.

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.

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.

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 121 Core Competencies

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

- *Add Core Competencies here*

Student Learning Outcomes: MA 121 Precalculus Mathematics

Successful completion of MA 121 will help students:	**RCSJ Core Competencies**	**Evaluation / Assessment** **(Additional means of evaluation may be included by individual instructors)**
Create and analyze graphs of functions		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Identify and graph transformations, combinations, and inverses of polynomial functions		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Analyze and solve rational functions by applying knowledge of synthetic division, complex numbers, and asymptotic graphs		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Recognize, graph, and evaluate exponential and logarithmic functions		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Apply properties of logarithms to evaluate, rewrite, expand, or condense logarithmic expressions		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Solve exponential and logarithmic equations and apply exponential growth models, exponential decay models, logistic growth models, and logarithmic to solve real-life problems		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project

Successful completion of MA 121 will help students:	**RCSJ Core Competencies**	**Evaluation / Assessment** **(Additional means of evaluation may be included by individual instructors)**
Solve systems of equations by substitution, by elimination, and by graphing		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Convert and apply radian and degree measure		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Apply angles and trigonometric functions to model and solve real-life problems		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Evaluate trigonometric functions using a unit circle, acute angles, or calculator		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Interpret and evaluate trigonometric functions using fundamental trigonometric identities, reference angles		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Create and interpret graphs of the trigonometric functions, inverse trigonometric functions, composition of trigonometric functions, and inverse functions		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project

Successful completion of MA 121 will help students:	**RCSJ Core Competencies**	**Evaluation / Assessment** **(Additional means of evaluation may be included by individual instructors)**
Utilize fundamental trigonometric identities to evaluate trigonometric functions, simplify trigonometric expressions, and rewrite trigonometric expressions		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Apply trigonometric identities to verify other trigonometric identities, solve trigonometric equations, and construct further trigonometric identities		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Apply the law of sines and the law of cosines to solve oblique triangles and model real-life problems		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Recognize a conic as the intersection of a plane and double-napped cone, convert information, or a general form of equation of a conic, to its standard form		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Evaluate, analyze, graph a set of parametric equations for a given value of the parameter and convert a set of parametric equations as a single rectangular equation		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project
Plot points on the polar coordinate system, and convert points and equations from rectangular to polar form		• Class participation/Attendance • Quizzes and lecture exams • Final Exam • Lab reports (incl. field trips) • Project

Topical Outline

Graphs and Functions

- Graphs of equations
- Lines
- Functions
- Library of functions
- Transformation of functions
- Combining functions; composite functions
- Inverse functions

Systems of Equations

- Systems of equations in two variables
- Systems of equations in Three variables

Polynomial and Rational Functions

- Quadratic functions
- Polynomial functions
- Dividing polynomials and the Rational Zeros Test
- Zeros of a polynomial function
- Rational functions

Exponential and Logarithmic Functions

- Exponential functions
- Logarithmic functions
- Exponential and logarithmic equations and inequalities

Trigonometric Functions

- Angles and their measure
- The Unit Circle: trigonometric functions of real numbers
- Trigonometric functions of angles
- Graphs of Sine and Cosine functions
- Graphs of other trigonometric functions
- Inverse trigonometric functions

Applications of trigonometric functions (triangle trigonometry)

- Right–triangle trigonometry
- The Law of Sines
- The Law of Cosines

Analytic Trigonometry

Trigonometric identities and equations

Trigonometric equations

Sum and Difference formulas

Double-Angle and Half-Angle formulas

Product-to-Sum and Sum-to-Product formulas

Analytic Geometry (including Conics and Polar and Parametric Equations)

Conic Sections: overview

The Parabola

The Ellipse

The Hyperbola

Parametric Equations

Polar Coordinates

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 or (Cumberland) Nathaniel Alridge, Jr., JD, Director, Diversity and Equity/Title IX and Judicial Affairs, 856-691-8600, ext. 1414 or 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, ADAAA/504 Officer at 856-415-2265 or 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

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.

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