



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

MAT 121: STRUCTURES OF MATHEMATICS II

Syllabus

Lecture Hours/Credits: 3/3

Catalog Description

Prerequisite: MAT 120

This course is designed primarily for elementary education majors. The course will require students to investigate problems in order to deepen their conceptual and procedural understanding in the areas of algebra, data analysis, probability, geometry, measurement, and systematic listing and counting.

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.

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

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 121 CORE COMPETENCIES

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

- Quantitative Knowledge and Skills

Student Learning Outcomes: STRUCTURES OF MATHEMATICS II

Successful completion of MAT 121 will help students:	RCSJ Core Competencies	Evaluation / Assessment (Additional means of evaluation may be included by individual instructors)
Use mathematics to communicate, reason, & solve problems	Quantitative Knowledge and Skills	Assignments, Exams
Develop quantitative problem solving strategies using mathematical terms.	Quantitative Knowledge and Skills	Assignments, Exams
Use mathematics to describe real-world relationships and develop conjectures and intuitive proofs	Quantitative Knowledge and Skills	Assignments, Exams
Demonstrate computational and statistical fluency.	Quantitative Knowledge and Skills	Assignments, Exams

Topical Outline

Unit 1. Algebraic Thinking (4 weeks)

- Reasoning about Algebra
- Multiple representations for proportional reasoning
- Quantitative models
- Operations with polynomials and their properties
- Linear Functions
- Modeling relationships between quantities
- Slopes and intercepts
- Linear Equations and Inequalities
- Reasoning about solving linear equations and inequalities
- Systems of linear equations

2. Geometry & Measurement (7 weeks)

- Geometric properties Review of properties of lines, angles, and planes
- Angle relationships
- Polygons, with focus on triangles and quadrilaterals
- Three-dimensional geometric figures, including nets, projections, slicing, and use of isometric dot paper
- Geometric transformations
- Reflections and the coordinate plane
- Rotations and translations as compositions of reflections
- Dilations
- Congruence
- Similarity
- Pythagorean Theorem
- Proof of theorem and its converse
- Distance between two points
- Applications
- Measurement Review of systems of measurement, including customary and metric units
- Development of formulas for perimeters, areas, surface areas, and volumes of common geometric shapes
- Composing & decomposing shapes to solve measurement problems in the plane and space
- Similarity and scaling real objects

3. Statistics and Probability (4 weeks)

- Random Sampling
- Descriptive Statistics
- Summarize and describe data distributions (center, spread, overall shape)
- Statistical questions and exploratory data analysis
- Measures of central tendency and variability
- Mean, and mean absolute deviation
- Median and interquartile range
- Comparing populations
- Normal distribution & standard deviation
- Bivariate Data
- Categorical data and two-way tables
- Scatterplots and informal lines of best fit – graphical description, with connections to slope-intercept forms of equations
- Systematic Listing and Counting
- Venn diagrams, sets, and counting techniques
- Multiplication Principle of Counting
- Permutations, including use of factorials
- Combinations
- Probability
- Frequency concept of probability
- Mathematical descriptions of probability, including applications
- Probability models
- Expected value

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, ADA/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 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 or call the office at 856-415-2265 or 856-415-2247 to speak to the Assistant Director Carol Weinhardt, 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
Non-Confidential Reporting 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
Non-Confidential Reporting 9-1-1 and Campus Security	9-1-1 Gloucester County Emergency Management Dispatch Campus Security Blue Light Emergency Phones OR ext. 4444 from any campus desk phone	9-1-1 or push RED button on Campus Blue Light Emergency Phones 856-681-6287
Non-Confidential On-Campus Reporting Support Services	Almarie J. Jones Special Assistant to the President Diversity and Equity/Title IX and Compliance John F. Ryder Director Student and Veteran Affairs	856-415-2154 College Center, Room 116 ajones@rcsj.edu 856-468-5000, ext. 6456 College Center, room 202 jryder@rcsj.edu
Confidential On-Campus Counseling and Support Services	Lois Y. Lawson-Bridgell, Ph.D. MSW, LSW, Director Counseling & Wellness Services Center William Leonard, Ph.D. Intervention Teams Consultant Crystal Noboa, LSW, MSW Director, The Center for People in Transition (PIT) Diane Mussoline, EdS, LMFT Director of Behavioral Services	856-464-5236 llawsonb@rcsj.edu College Center, Room 206 856-415-2119 wleonard@rcsj.edu College Center, STEM Office C-168 856-415-2264 cnoboa@rcsj.edu Workforce Development Bldg., room 809 856-494-5665 dmussoli@rcsj.edu College Center, Room 200A
Confidential Off-Campus Full-Service Support	Center for Family Services/ Services Empowering Rights of Victims (SERV)	1-866-295-7378 Camden and Gloucester counties centerffs.org/serv
Hospitals with Sexual Assault Nurse Examiners	Inspira Medical Center Jefferson Washington Township Hospital	700 Mullica Hill Rd. Mullica Hill, NJ · 856-508-1000 435 Hurffville-Crosskeys Rd., Turnersville, NJ · 856-582-2500