B.S/M.A in Mathematics

The dual Bachelor of Science/Master of Arts in Mathematics program provides an opportunity for individuals to pursue advanced study in mathematics and to develop skills that can lead to success in today's technologically oriented society. Whether the goal involves applying mathematics to solve problems in business and industry, teaching in higher education or preparing for further graduate study in mathematics or related fields, this program enables each student to pursue a course of study that is appropriate for his or her interests.

The dual degree program is designed to be completed in **five** years. Students will begin the first (freshman) year of the program through the third (junior) year fulfilling undergraduate B.S. in Mathematics course requirements and general education course requirements. The fourth (senior) year marks the official start of the dual degree program. In year four students will begin to take some graduate level courses and will complete any remaining undergraduate B.S. in Mathematics and general education course requirements. Year five includes the remaining credits of M.A. in Mathematics courses to be taken as a graduate student.

Admissions Requirements

The following is a list of items required to begin the application process for the 4 + 1 B.S./M.A. in Mathematics program. There may be additional action or materials required for admission to the program. Upon receipt of the materials below a representative from the CGCE Admissions Processing Office will contact you with confirmation or indicating any missing items.

- One letter of recommendation from a faculty member in the Mathematics Department
- Must be currently enrolled in the B.S. in Mathematics undergraduate degree program
- Successfully completed a minimum of 24 credits of undergraduate Mathematics coursework
- A minimum undergraduate Mathematics (major) GPA of 3.5
- Completion of the form Accelerated 4+1 B.S./M.A. in Mathematics Dual Degree Program: Undergraduate student registering for a graduate course
- Completion of the form All Accelerated 4+1 B.S.(B.A.)/M.S.(M.A.) Dual Degree Programs: transition into The Graduate School

Recommended Sequence of Courses for the B.S/M.A in Mathematics

1st YEAR (Freshmen)

FALL SEMESTER (16 s.h.)
Calculus I, Intro to Scientific Programming, Intro to Symbolic Logic, College Comp I, Gen Ed

SPRING SEMESTER (17 s.h.)
Calculus II, Discrete Math, College Comp II, Physics I with Calc, Gen Ed

2nd YEAR (Sophomore)

FALL SEMESTER (17 s.h.)
Calculus III, Linear Algebra, Physics II with Calc, Public Speaking, Gen Ed

SPRING SEMESTER (15 s.h.)
Ordinary Diff Equations, Prob & Stat I, Math Restricted Elective, Gen Ed, Gen Ed (LIT)

3rd YEAR (Junior)

FALL SEMESTER (15 s.h.)
Modern Algebra I, Intro to Real Analysis I, Math Restricted Elective, Gen Ed, Gen Ed (MGS)

SPRING SEMESTER (16 s.h.)
Intro to Complex Analysis, Math Restricted Elective, Math Restricted Elective, Gen Ed, Gen Ed

4th YEAR (Senior) – YEAR ONE OF PROGRAM

FALL SEMESTER (15 s.h.)

Track 1 (Even Years)
Grad Linear Algebra, Grad Real Analysis I, Math Restricted Elective, Math Restricted Elective

Track 2 (Odd Years)
Grad Complex Analysis I, Grad Abstract Algebra I, Math Restricted Elective, Math Restricted Elective (or Gen Ed or Free Elective)

SPRING SEMESTER (15 s.h.)

Track 1 (Odd Years)
Math Seminar, Math Restricted Elective (or Gen Ed or Free Elective), Grad Math Elective, Grad Math Elective

Track 2 (Even Years)
Math Seminar, Math Restricted Elective (or Gen Ed or Free Elective), Grad Math Elective, Grad Math Elective

5th YEAR (Graduate Student) – YEAR TWO OF PROGRAM

FALL SEMESTER (9 s.h.)

Track 1 (Odd Years)
Grad Abstract Algebra I, Grad Complex Analysis I, Grad Math Elective (or Grad Math Seminar if offered)

Track 2 (Even Years)
Grad Linear Algebra, Grad Real Analysis I, Grad Math Seminar (or Grad Math Elective)

SPRING SEMESTER (9 s.h.)

Track 1 (Even Years)
Grad Math Elective, Grad Math Elective, Grad Math Seminar (or Grad Math Elective)

Track 2 (Odd Years)
Grad Math Elective, Grad Math Elective, Grad Math Elective (or Grad Math Seminar)

Contact: Dr Ronald Czochor (Czochor@rowan.edu)

B.S. Math Degree Program

The B.S. Math Degree Program consists of 120 semester hours and follows a B.S. degree model. Prerequisites are in brackets [ ]; courses are 3 semester hours (s.h.) unless noted. Required math courses are in **<u>BOLD FACE</u>**.

1. **General Education-51 s.h.**
   For each of the first five banks, only the courses listed in the General Education Guide in the given bank may be selected. General Education electives may be selected from all courses offered in the College of Liberal Arts and Sciences, courses listed in the General Education banks, or the course Health and Wellness.

   I.   Arts-3 s.h.
   II.   Communications-9 s.h.
             College Composition I
             College Composition II
             Public Speaking
   III.   History, Humanities, and Language-6 s.h.
             Introduction to Symbolic Logic (may NOT be taken P/NC)
   IV.   Social and Behavioral Sciences-6 s.h.
   V.   Science and Mathematics-14s.h.
             Physics I and II with Calculus (may NOT be taken P/NC)
             Computer Programming and Discrete Math course are required.
   VI.   Approved General Electives 13 sh.
   Note: (a) One of the above courses must be labeled as Multicultural/Global Studies (M/G).
   (b) One of the above courses must be labeled as General Education Literature (LIT).

2. **Free Electives-9 s.h.**

3. **Major Requirements-60 s.h.**

   I. Required Courses-33 s.h.
   Math 01.130 Calculus I [Math 01.122 or equivalent prep.] 4 s.h.
   Math 01.131 Calculus II [Math 01.130.] 4 s.h.
   Math 01.230 Calculus III [Math 01.131] 4 s.h.
   Math 01.210 Linear Algebra [Math 01.131 & Math 03.150] 3 s.h.
   Math 01.230 Ordinary Differential Equations [Math 01.230 & Math 01.210] s.h.
   Math 01.330 Introduction to Real Analysis I [Math 01.230] 3 s.h.
   Math 01.340 Modern Algebra I [Math 01.210 & Phil.09.130] 3 s.h.
   Math 02.360 Introduction to Probability and Statistics I [Math 01.131] 3 s.h.
   Math 01.430 Introduction to Complex Analysis [Math 01.330] 3 s.h.
   Math 01.499 Mathematics Seminar [Senior Standing and successful completion of Math 01.340, Math 01.231, Math 01.330, and one of the following two courses: Math 01.310 or Math 02.360] 3 s.h.

   II. Restricted Electives-27 s.h.

Math 01.205   Technological Tools for Discovering Mathematics [Math 01.102 & Math 01.130] 2 s.h.
Math 01.310   College Geometry [Math 01.131 & Phil.09.130] 4 s.h.
Math 01.331   Introduction to Real Analysis II [Math 01.230] 3 s.h.
Math 01.332   Numerical Analysis [CS.01.102 & Math 01.210] 3 s.h.
Math 01.341   Modern Algebra II [Math 01.340] 3 s.h.
Math 01.352   Theory of Numbers [at least 3 math BS courses] 3 s.h.
Math 01.354   Introduction to Topology [Math 01.330] 3 s.h.
Math 01.386   Introduction to Partial Differential Equations [Math 01.231] 3 s.h.
Math 01.410   History of Mathematics [Math 01.131] 3 s.h.
Math 01.421   Mathematics Field Experience [Math 01.131 & Math 02.360] 3 s.h.
Math 02.361   Introduction to Probability and Statistics II [Math 01.360] 3 s.h.
Math 03.400   Applications of Mathematics [Math 01.210 & Math 01.230] 3 s.h.
Math 03.411   Deterministic Models in Operations Research [Either Math 01.230 and Math 01.210 **or** Math 01.235 Math for Engineering Analysis I **or** permission of the instructor] 3 s.h.
Math 03.412   Stochastic Models in Operations Research [Math 02.360 **and one of the following:** Math 03.411 **or** Math 01.230 and Math 01.210 **or** Math 01.235 Math for Engineering Analysis I **or** Permission of the instructor]

*A **MAXIMUM** of two courses from the following list can be counted as **RESTRICTED** Electives*

CS   07.340   Design and Analysis of Algorithms [CS.04.222 & 0707.210] 3 s.h.
CS   07.422   Theory of Computing [CS.04.222, CS.07.210, & Math 01.131] 3 s.h.
Phys 02.300   Modern Physics [1902.201 & Math 01.131] 4 s.h.
Phys 02.315   Analytical Mechanics (4 s.h.)
Phys 02.325   Mathematical Physics [1 Math 01.131 & Phys.02.201 or Ph] 3 s.h.
Phys 02.387   Statistical Physics (3 s.h.)
Phys 02.401   Quantum Mechanics I (4 s.h.)
Phys 02.430   Electricity and Magnetism I (4 s.h.)
Phys 08.400   Physical Chemistry I (3 s.h.)
Phys 08.401   Physical Chemistry II (3 s.h.)

M.A. Math Degree Program

Students will complete a minimum of 30 semester hours of graduate credits in mathematics. Twelve semester hours will provide a core experience for all graduate students, including one course in linear algebra, one course in abstract algebra, and two courses in analysis.

Students will also complete 3-9 s.h. from Bank A, 6-12 s.h. from Bank B, and a minimum of 3s.h. in Seminar and Research. Students should enroll in the required core courses first. The Mathematics Seminar is required and should be taken after most of the course work is completed. The comprehensive exam is usually taken during the Mathematics Seminar.

Prerequisites are in brackets [ ]; courses are 3 semester hours (s.h.) unless noted. Required math courses are in **BOLD FACE**.

I. Required Core …………………………………………………..12 .s.h.
Math 01.502   **Linear Algebra & Matrix Theory**
Math 01.510   **Real Analysis I**
Math 01.512   **Complex Analysis I**
Math 01.524   **Abstract Algebra I**

II. Bank A …………………………………………………….3—9 s.h.
Math 01.511   Real Analysis II [Math 01.510]
Math 01.513   Complex Analysis II [Math 01.512]
Math 01.527   Abstract Algebra II [Math 01.524]

III. Bank B …………………………………………………….6—12 s.h.
Math 01.500   Foundations of Mathematics
Math 01.503   Number Theory
Math 01.504   Mathematical Logic
Math 01.505   Probability & Statistics
Math 01.507   Differential Geometry
Math 01.515   Engineering Applications of Analysis
Math 01.520   Topics in Applied Mathematics
Math 01.521   Non-Linear Differential Equations
Math 01.522   History of Mathematics
Math 01.525   Modern Geometry
Math 01.526   Point Set Topology
Math 01.529   Numerical Analysis
Math 03.511   Operations Research I
Math 03.512   Operations Research II [Math 03.511 OR I]
Math 03.550   Topics in Discrete Mathematics

IV.   Seminar and Research ……………………………………...3—6 s.h.

Math 01.533   Mathematics Seminar [Completion of 15 s.h. graduate math courses]
Math 01.550   Independent Study

Total …………………………………………………………....30—33 s.h.