Mathematics (A.S.)

A Dual Admissions Program with Rutgers-Newark, Kean University, and New Jersey City University

Division of Mathematics, Engineering Technologies and Computer Sciences — Curriculum Code: 0604

Will Earn Upon Program Completion: Associate in Science (A.S.) Degree

Mathematics encompasses logic and methodology of reasoning and provides the tools for critical thinking and decision-making. The program emphasizes methodical problem-solving techniques and is designed for students who intend to pursue a bachelor's degree in mathematics, applied mathematics, mathematics education, or a related field. Students will acquire fundamental knowledge in proof and theory, applications, and algorithms. Developing an appreciation for and proficiency in using graphic utilities and other technological devices prepares you for success in mathematically-rich courses.

Program Requirements

GENERAL EDUCATION REQUIREMENTS
Written & Oral Communication (6 credits)
ENG 101 (3 credits)
ENG 102 (3 credits)

Quantitative Knowledge & Skills (4 credits)
MTH 121 (4 credits)

Scientific Knowledge & Reasoning (8 credits)
PHY 103 (4 credits)
PHY 104 (4 credits)

Society & Human Behavior (6 credits)
ECO 101 (3 credits)
AND
Choose one of the following courses: ANT 101ANT 105ECO 102POL 101POL 104PSY 101PSY 102PSY 219SOC 101SOC 108 or SOC 219 (one 3-credit course)

Humanistic Perspective (6 credits)
Choose one of the following literature courses: ENG 205ENG 208ENG 215ENG 221ENG 222ENG 232ENG 237ENG 238ENG 242ENG 250ENG 263 or ENG 264 (one 3-credit course)
And

Choose one of the following art or music courses: ART 100ART 101ART 102; MUS 100MUS 108MUS 109 or MUS 117 (one 3-credit course)

Historical Perspective (3 credits)
Choose one of the following history courses: HST 101HST 102HST 111HST 112HST 121HST 122HST 131HST 132HST 134HST 135HST 136HST 137HST 161 or HST 162 (one 3-credit course)

MAJOR COURSE REQUIREMENTS
MTH 136* Discrete Mathematics (3 credits)
MTH 222 Differential Equations (4 credits)
MTH 239 Introduction to Linear Algebra (3 credits)
Choose three Major electives depending on the branch of mathematics you wish to pursue** (three 3- and/or 4-credit courses)

Note: Honors students or students who wish to purse mathematics education may subsitute a research-based course, such as Rutgers' STS:307 Education Research and Evaluation (3 credits) or a similar Capstone research course for MTH 136, if approved by a Mathematics Department academic advisor (faculty member).

**Note: Required Major elective courses, based on which branch of mathematics a student wishes to pursue, are as follows:*

Pure or Applied Mathematics branch – Choose CSC 122 Computer Science II (4 credits), a Computer Science elective – any 200-level CSC course (one 4-credit course), and anyforeign language course designated ARB, FRN, ITL, or SPN (one 3-credit course).

Mathematics Primary Education branch – Choose three of the following courses: EDU 101 Introduction to Education (3 credits), EDU 103 Philosophy & History of Education (3 credits), EDU 201 Education in Urban Environment (3 credits), and/or CSC 122 Computer Science II (4 credits).

Mathematics Secondary Education branch – Choose three of the following Rutgers-Newark courses: Rutgers 300:292 Social Foundations of Urban Education (3 credits), Rutgers 300:295 Adolescent Psychology & the Urban Experience (3 credits), Rutgers 300:298 21st Century Urban Educator (3 credits), and/or Rutgers 640:314 Foundations of Modern Math (3 credits).

ADDITIONAL COURSE REQUIREMENTS
CSC 121 Computer Science I (4 credits)
MTH 122 Calculus with Analytic Geometry II (4 credits)
MTH 221 Calculus with Analytic Geometry III (4 credits)

RECOMMENDED SEQUENCE OF COURSES
Total Credits Required for Degree: 64 – 67

Note: The program pre-requisite courses (MTH 100 Introductory College Mathematics, MTH 119 Pre-Calculus I, and MTH 120 Pre-Calculus II) should be completed before your first semester at ECC (i.e., during your senior year in high school or during summer sessions or through placement exams). Mathematics placement tests are available for all pre-requisite courses (see

http://placement.mathography.org for further information). If you are still in high school, the pre-requisite courses may be completed through the High School Initiative Program free of charge if your school participates. Also, PHY 101 College Physics I and PHY 102 College Physics II are strongly recommended as program pre-requisites if you did not take physics in high school at all.

First Semester
ENG 101 College Composition I (3 credits)
MTH 121 Calculus with Analytic Geometry I (4 credits)
PHY 103 General Physics I (4 credits)
CSC 121 Computer Science I (4 credits)

Second Semester
ENG 102 College Composition II (3 credits)
MTH 122 Calculus with Analytic Geometry II (4 credits)
PHY 104 General Physics II (4 credits)
Major elective course (one 3- or 4-credit course)

Summer Session
Historical Perspective requirement (3 credits)

Third Semester
MTH 136 Discrete Mathematics or other approved research-based course (3 credits)
MTH 221 Calculus with Analytic Geometry III (4 credits)

Humanistic Perspective art or music requirement (one 3-credit course)
Humanistic Perspective literature requirement (one 3-credit course)
Society & Human Behavior requirement (one 3-credit course)

Fourth Semester
MTH 222 Differential Equations (4 credits)
MTH 239 Introduction to Linear Algebra (3 credits)
ECO 101 Principles of Economics (Macro) (3 credits)
Major elective (one 3- or 4-credit course)
Major elective (one 3- or 4-credit course)

NOTES:

(1) The two General Education Integrated Course Goals, Ethical Reasoning & Action and Information Literacy, are both addressed by the required curriculum described above, regardless of specific choices made by the individual student.

(2) This plan assumes the completion of all required developmental courses in Reading, English, and Mathematics as well as other pre-requisites and co-requisites for some of the courses, as listed in the Course Descriptions section.