John Carroll University Mathematics Programs Fall 2015

Major and Minor Requirements

Major in Mathematics: 49 semester hours. CS 128-128L or CS 150; MT 135 or MT 133-134, 136 , 200, 229, 233, 271, 342, 431, 441; one course from Category A, one course from B, and three courses from Category C.

Category A: MT 450, 452.

Category B: MT 421, 436, 452.

Category C: MT courses numbered 400-480.

- Students may not use the same course to satisfy a requirement in multiple categories.
- Students earning the minor in Statistics may not use MT 421 or MT 422 to satisfy the requirements for Categories B or C.
- An additional course from Category C may be substituted for MT 200.
- Students who are considering further study in mathematics should take MT 452.

A comprehensive examination is required.

Major in Teaching Mathematics: 37 semester hours. CS 128-128L or CS 150; MT 135 or MT 133-134, 136, 200, 229, 233, 271, 431, 441, 450, and 469.

Required Support Sequence: 34 semester hours. ED 100, 201, 253, 255, 337, 350, 386, 405C, 427, 444C; PS/ED 262.

A comprehensive examination is required.

Minor in Mathematics: 24 hours. MT 135, 136, 233, 271, three additional MT courses; one may be MT 200 or MT 229 or MT 242, the other two (or all three) must be numbered 300-379 and/or 400-479. At most, one of MT 322, MT 421, and MT 422 may be used to satisfy this requirement, and none of these may be used simultaneously for both the minor in Mathematics and the minor in Statistics.

Minor in Statistics: 19-20 semester hours. MT 135; one of MT 223/228/229, 322, 422; two elective courses**:** MT 342 and MT 421, or BL 224 and BL 444, or CH 261/263 and CH 441/443, or EC 409 and EC 410, or PS 301/301L and PS 401. Students who minor in statistics cannot use MT 421 or MT 422 also to satisfy the requirements of the mathematics major or minor.

Students who plan to earn the B.S. degree in Mathematics and become licensed to teach at the AYA level should take all of the courses listed for the B.A. degree, and then enough additional MT courses to complete the requirements for the B.S. degree.

To make planning easier, the following list gives the prerequisites for all upper-level MT courses, both required and elective:

Prerequisite structure of required courses

(Some of these courses are required for one degree but not the other; some of them are electives.)

Number	Title	Prerequisite
MT 135	Calculus & Analytic Geometry I	
MT 136	Calculus & Analytic Geometry II	MT 135
MT 200	Explorations in Mathematics	
MT 233	Calculus & Analytic Geometry III	MT 136
MT 229	Probability & Statistics	MT 135
MT 271	Discrete Mathematics and Matrix Algegra	MT 135
MT 342	Introduction to Linear Algebra	MT 271 or permission
MT 421	Mathematical Statistics	MT 229, MT 233
MT 422	Applied Statistics	MT 229 or MT 228 or MT 223
MT 431	Introduction to Real Analysis	MT 136, MT 271
MT 432	Advanced Calc of Several Variables	MT 233
MT 436	Complex Analysis	MT 136, MT 271
MT 441	Abstract Algebra	MT 271
MT 450	Euclidean & Non-Euclidean Geometry	MT 271 or permission
MT 452	Topology	MT 271, MT 233
MT 453	Differential Eq'ns and Dynamical Systems	MT 233
MT 468	Number Theory	MT 271
MT 469	History of Mathematics	MT 271
MT 479	Combinatorics and Graph Theory	MT 271
MT 480	Topics in Mathematics	varies; most likely MT 271

Suggestions for scheduling for students planning B.S. in Mathematics:

- Calculus (one of MT 135, 136 or 233) should be taken as soon as possible, starting with Fall of the freshman year. Students should also plan to take Calculus II (MT 136) in the semester immediately after MT 135, whenever possible.
- MT 200 (Explorations in Mathematics) should be taken in the Fall of the freshman or sophomore year, whenever possible.
- MT 229 (Probability and Statistics) should be taken in the Spring of the freshman year, if possible.
- MT 271 Discrete Mathematics should be taken by the Spring of the sophomore year, whenever possible. This course is a prerequisite for nearly every 300- or 400-level MT course.
- Under normal circumstances, students should take MT 441 (Abstract Algebra) and MT 431 (Analysis) during the Fall and Spring semesters of the junior year, respectively.
- MT 342 (Linear Algebra) should be taken in the Spring of either the junior or senior year, as available.

Suggestions for scheduling for students planning B.A. in Teaching Mathematics:

- Calculus (one of MT 135, 136 or 233) should be taken as soon as possible, starting with Fall of the freshman year. Students should also plan to take Calculus II (MT 136) in the semester immediately after MT 135, whenever possible.
- MT 200 (Explorations in Mathematics) should be taken in the Fall of the freshman or sophomore year, whenever possible.
- MT 229 (Probability and Statistics) should be taken in the Spring of the freshman year, if possible.
- MT 271 Discrete Mathematics should be taken by the Spring of the sophomore year, whenever possible. This course is a prerequisite for nearly every 300- or 400-level MT course.
- Under normal circumstances, students should take MT 441 (Abstract Algebra) and MT 431 (Analysis) during the Fall and Spring semesters of the junior year, respectively.
- MT 450 (Euclidean and Noneuclidean Geometry) and MT 469 (History of Mathematics) should be taken during the Fall semesters of the junior and senior years, as available.