Mathematics (MTH)

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Degrees Offered: M.A., Ph.D.

Specializations: Pure and Applied Mathematics, Statistics

The Department of Mathematics at the University of South Florida, Tampa Campus, is composed of approximately thirty faculty who do research in a variety of fields, and teach courses ranging from the freshman to the doctoral level. The research at the Department is primarily in various areas of Algebra, Analysis, Discrete Mathematics, Partial Differential Equations, Probability, Statistics, and Topology, including the following fields: Applied Mathematics, Approximation Theory, Combinatorics, Computational Statistics, Control Theory, DNA computing, Dynamical Systems, Graph Theory, Knot Theory, Nonlinear Analysis, Number Theory, Special Functions, Theoretical Computer Science.

The Department serves as the editorial base for the international journals: Abstract and Applied Analysis and Journal of Theoretical Probability. The Center for Mathematical Services within the department provides lectures, special programs for secondary students, and in service training programs in mathematics.

Some graduate courses are organized into Core and Elective Sequences as follows.
Core Sequences
  Algebra: MAS 5107, 5311, 5312
  Analysis: MAA 5306, 5307, 5616
  Mathematical Statistics: STA 5326, 6326
  Topology: MTG 5316, 5317

Elective Sequences
  Applied Mathematics: three courses, one from each group listed below.
    (Group A) MAP 5407, 5345
    (Group B) MAA 5405, MAT 5932 (MAD 4401)
    (Group C) MAP 6205, MAT 6932 (Dynamical Systems II)
  Combinatorics: MAD 6206, 6207
  Complex Analysis: MAA 6406, 6407
  Statistical Methods: STA 5166, 6167
  Dynamical Systems: MAT 5932 (Dynamical systems I), 6932 (II)
  Foundations: MUF 5306, 6307
  Linear Models and Multivariate Analysis: STA 6208, 6746
  Nonlinear Analysis: MAP 5316, 5317
  Ordinary Differential Equations: MAP 6336, MAT 5932 (Dynamical systems I)
  Partial Differential Equations: MAP 5345, 6356
  Probability: STA 5446, 6447
  Stochastic Processes and Time Series Analysis: STA 6206, 6876
  Theory of Computing: MUF 5306, MAD 6616

For degree requirements, each course from the Elective Sequence list above counts towards only one Elective Sequence. A qualifying examination based on a Core Sequence is called a Core Qualifying Examination. The syllabus for each examination is available from the Department. Core Qualifying Examinations are offered in January, May and September. A student who passes a Core Qualifying Examination at Ph.D. level will be considered to have completed the corresponding Core Sequence. Credit hours of MAT 6908 Independent Study, MAT 6939 Graduate Seminar, and MAT 6911/7912 Directed Research, earned before passing two Core Qualifying Examinations at Ph.D. level, do not count towards M.A. or Ph.D. degree. These courses, MAT 6908, 6911, 6939 and 7912, however, can be taken by a student before passing two Core Qualifying Examinations at Ph.D. level, with an approval from the Graduate Program Director, and also from the Seminar Organizer for MAT 6939. The course work for more than one credit hours for MAT 6939 needs an approval from the Graduate Committee.

M.A. in Mathematics

Additional Admission Requirements
In addition to the University and College requirements, entrants to the M.A. program must have:
1. A Bachelor’s degree in Mathematics or a related area with strong mathematical content;
2. At least a 650 quantitative score on the GRE; and
3. At least a 3.5 GPA in undergraduate Mathematics courses.
Students with insufficient preparation in real analysis and/or abstract algebra will be required to take MAA 4211 and/or MAS 4301 before or during their first semester of study.

Program Requirements
In addition to the University and College requirements, the students must fulfill the following requirements.

1. Credit Hours: A candidate must complete at least 30 credit hours in Mathematics. Specifically,
   (A) The Mathematics graduate courses of 5000 level or higher, offered regularly for mathematics majors from the Mathematics department, are counted towards the 30-hour requirement.
   (B) Up to 6 hours of 4000 level or higher courses, taken from our department or other departments at USF, may be counted towards the 30-hour requirement with approval by the Graduate Program Director and the Department Chairman.

2. Completion of Sequences: A candidate must complete two Core or Elective Sequences, at least one of which must be a Core Sequence, and receive at least a 3.0 average in each sequence.

3. Thesis or Examination Requirement: Each candidate for the M.A. degree must either be examined on a thesis or pass one of the written Core Qualifying Examinations.

   A student who elects the thesis option must register for a minimum of 6 credit hours in MAT 6971, only 6 hours of which may be applied toward the 30-hour degree requirement. The comprehensive examination takes the form of an oral thesis defense, in which the candidate must demonstrate knowledge of the general subject area of the thesis.

   A student who elects the exam option must pass one of the Core Qualifying Examinations at M.A. level. A student may repeat each examination once.

Ph.D. in Mathematics

Additional Admission Requirements
In addition to the M.A. program requirements, entrants to the Ph.D. program must have a Master’s degree in Mathematics or a strong enough background in Mathematics as determined by the Graduate Admissions Committee, and two letters of recommendation from mathematicians indicating an aptitude for doctoral study.

Program Requirements
In addition to the University and College requirements, the students must fulfill the following requirements.

1. **Core Qualifying Examinations:** The student is required to pass two of the Core Qualifying Examinations at Ph.D. level. A student is expected to complete both within 13 months after entering the Ph.D. program unless an extension is granted by the Mathematics Graduate Committee. A student may repeat each examination once.

2. **Elective Qualifying Examination:** After passing two Core Qualifying Examinations, the student will select a Dissertation Advisor and a Doctoral Committee will be appointed by the Department Chairperson. The Committee will determine a course of study leading to the written Elective Qualifying Examination, which may be based on one of the Elective Sequences above, possibly supplemented by other material. The syllabus for this examination, and the names of two examiners from the Faculty, must be approved by the Mathematics Graduate Program Director at least one semester before the examination is to take place. A student is expected to complete all three examinations within 25 months after entering the Ph.D. program unless an extension is granted by the Mathematics Graduate Committee. A student may repeat each examination once.

The student will be admitted to candidacy after completion of the above two requirements.

3. **Completion of Four Sequences:** The student must complete four sequences from among Core and Elective Sequences with at least a 3.0 average in each sequence.

4. **Progress Evaluation:** Each Spring semester after admission to candidacy, the candidate shall give an oral presentation to the Doctoral Committee of the problem(s) under investigation. The presentation may also include a discussion of partial results. The Dissertation Advisor shall submit to the Department Chairperson a written report of the presentation.

5. **Dissertation:** Students admitted to candidacy are required to take at least 16 hours in MAT 7980 Doctoral Dissertation, with a minimum of 6 credits of dissertation hours accumulated during each previous 12-month period (previous 3 terms, e.g., Fall, Spring, Summer) until the degree is granted.

The dissertation is expected to contain new mathematical results which are worthy of publication. Research towards the dissertation typically forms the major part of the work required for the Ph.D. in Mathematics.

6. **External Examiner Requirement and the Final Oral Examination:** The Final Oral Examination is also called the Dissertation Defense. The Department Chairperson will select an external examiner from a list provided by the Dissertation Advisor; the examiner should be both expert in the field and familiar with the standards expected for a Ph.D. A copy of the dissertation must be sent to the external examiner for review at least four weeks in advance of the Final Oral Examination. The reviewer’s report shall be provided to the Doctoral Committee before the Final Oral Examination. Alternatively, referees’ reports on papers based on the dissertation and accepted for publication may be substituted in lieu of the external examiner requirement.