Master Program in Mathematics (Statistics) Current Program

The use of statistical methodology is highly relevant for any person carrying research where data has been collected. Thus, Statistics is frequently used to validate research in fields such as engineering, biology, psychology, medicine, agriculture, etc. The main goal of this graduate program is to prepare students that will be able to apply statistical techniques to other fields in a correct way. The emphasis of the program is more in applied statistics than in theoretical statistics and probability. However, theoretical foundations of statistics and probability is considered in most of the courses. Students wishing to pursue a doctoral degree in statistics are encouraged to take more courses in theory of statistics, probability and stochastic processes.

Applicants should have an undergraduate degree in Mathematics or its equivalent. Candidates are expected to have approved undergraduate courses in Linear Algebra and Multivariate Calculus. The approval of at least an undergraduate course in Statistics is also required. Knowledge of computer programming is highly desirable.

In addition to the requirements of the Office of Graduate Studies, the Master of Science degree in Mathematics, Statistics track with Thesis, option I, requires:

1. 9 credits in core courses

- MATE 6261, Real Analysis I
- ESMA 6600, Probability Theory
- ESMA 6661, Theory of Statistics I

2. 9 credits from the following (area of specialization)

- ESMA 5015, Stochastic Simulations
- ESMA 6205, Applied Regression
- ESMA 6305, Statistical Methods
- ESMA 6607, Advanced Sampling Theory
- ESMA 6616, Linear Models
- ESMA 6660, Bio-statistical Analysis
- ESMA 6662, Theory of Statistics II
- ESMA 6665, Computational Statistics
- ESMA 6787, Experimental Design
- ESMA 6835, Topics in Statistics I
- ESMA 6836, Topics in Statistics II

3. 6 credits outside the area of specialization or major. The requirement of a
minimum of two out-of-discipline courses is to ensure cross-disciplinary breadth. The courses must be related to mathematics and should be chosen in a coherent way. These should be of level 5000 or higher. It is recommended that student choose these courses with the help of their advisor.

- 6000 or 5000 level courses not listed in the major, or
- 6000 or 5000 level courses outside the math department

4. 2 credits in Seminar

- MATE 6991, Seminar (1 credit)
- MATE 6992, Seminar (1 credit)

5. 6 credits in Thesis

- MATE 6999 (6 credits)

In addition, the candidate **must pass one** qualifying exam from

- Probability and Statistical Methods
- Theoretical Statistics and Regression

Option II: project option: the course and examination requirements are similar to Option I, however the 6 Thesis credits must be replaced by 6 Project credits. An oral examination on the project is also required.

Option III, no project, no thesis: the student should approve a minimum of **36** course credits:

- A minimum of 27 credits at graduate level
- A minimum of 21 credits in the area of specialization
- A minimum of 6 credits in courses related to, but outside the area of specialization.

In addition the student must pass **two (2)** exams from the above list.

Master Program in Mathematics (Statistics) Proposed Program

The use of statistical methodology is highly relevant for any person carrying research where data has been collected. Thus, Statistics is frequently used to validate research in fields such as engineering, biology, psychology, medicine, agriculture, etc. The main goal of this graduate program is to prepare students that will be able to apply statistical techniques to other fields in a correct way. The emphasis of the program is more in applied statistics than in theoretical statistics and probability. However, theoretical foundations of statistics and probability is considered in most of the courses. Students wishing to pursue a doctoral degree in statistics are encouraged to take more courses in theory of statistics, probability and stochastic processes.

Applicants should have an undergraduate degree in Mathematics or its equivalent. Candidates are expected to have approved undergraduate courses in Linear Algebra and Multivariate Calculus. The approval of at least an undergraduate course in Statistics is also required. Knowledge of computer programming is highly desirable.

In addition to the requirements of the Office of Graduate Studies, the Master of Science degree in Mathematics, Statistics track with Thesis, option I, requires:

1. 9 credits in core courses

- **ESMA 6305, Statistical Methods (cambio sugerido)**
- ESMA 6600, Probability Theory
- ESMA 6661, Theory of Statistics I

2. 9 credits from the following (area of specialization)

- ESMA 5015, Stochastic Simulations
- ESMA 6205, Applied Regression
- ESMA 6607, Advanced Sampling Theory
- ESMA 6616, Linear Models
- ESMA 6660, Bio-statistical Analysis
- ESMA 6662, Theory of Statistics II
- ESMA 6665, Computational Statistics
- ESMA 6787, Experimental Design
- ESMA 6835, Topics in Statistics I
- ESMA 6836, Topics in Statistics II

3. 6 credits outside the area of specialization or major. The requirement of a
minimum of two out-of-discipline courses is to ensure cross-disciplinary breadth. The courses must be related to mathematics and should be chosen in a coherent way. These should be of level 5000 or higher. It is recommended that student choose these courses with the help of their advisor.

- 6000 or 5000 level courses not listed in the major, or
- 6000 or 5000 level courses outside the math department

4. 2 credits in Seminar

- MATE 6991, Seminar (1 credit)

- MATE 6992, Seminar (1 credit)

5. 6 credits in Thesis

- MATE 6999 (6 credits)

In addition, the candidate **must pass one** qualifying exam from

- Probability and Statistical Methods
- Theoretical Statistics and Regression

Option II: project option: the course and examination requirements are similar to Option I, however the 6 Thesis credits must be replaced by 6 Project credits. An oral examination on the project is also required.

Option III, no project, no thesis: the student should approve a minimum of **36** course credits:

- A minimum of 27 credits at graduate level
- A minimum of 21 credits in the area of specialization
- A minimum of 6 credits in courses related to, but outside the area of specialization.

In addition the student must pass **two (2)** exams from the above list.