# APPLIED STATISTICS (MPS)

Graduate School

**CIP:** 27.0501 | **HEGIS:** 1702.00 | **NYSED:** 22119

## Graduate Field

Statistics (https://catalog.cornell.edu/graduate-school/statistics/)

## Program Description

The Master of Professional Studies (M.P.S.) degree in Applied Statistics is for persons interested in professional careers in business, industry or government. The M.P.S. program has three main components:

- A two-semester core course covering a wide range of statistical applications, computing, and consulting
- An in-depth statistical analysis project
- Elective coursework drawn from the resources of the Department of Statistical Science.

The program can be completed in one year by a well-prepared student with the equivalent of an undergraduate degree in statistics or applied mathematics. Students with less preparation can make up any missing prerequisites while at Cornell; in this case the program will take one to two years to complete.

The M.P.S. is intended for persons who want a short-term (one year) master's degree so as to go into business, industry, or government statistical work. The M.P.S. is not equivalent to an M.S. on several counts: the M.P.S. has a project (a large-scale data-analysis project) rather than a thesis or a qualifying exam (which would be the case for an M.S.). The mathematical probability/statistics component of the M.P.S. is less than it would be for an M.S. (which would be considered the first part of a Ph.D.).

## Program Information

- Instruction Mode: In Person
- Location: Ithaca, NY
- Minimum Credits for Degree: 30

## Program Requirements

- C- or better or S for S/U courses for all courses used to meet requirements
- A GPA of 2.5 or higher in courses used toward the MPS degree is required for graduation
- Minimum Semesters for Degree: 2

## Course Requirements

Additional course requirements may be set by the student's Special Committee. Program specific requirements that apply to all students are included below.

### Required Core Courses

| Code | Title | Hours |
|---|---|---|
| STSCI 5030 | Linear Models with Matrices | 4 |
| STSCI 5080 | Probability Models and Inference | 4 |
| STSCI 5954 | Project Development and Professional Communication | 2 |
| STSCI 5955 | Realtime Project Management | 1 |
| STSCI 5999 | Applied Statistics MPS Data Analysis Project | 4 |

### Track Requirements:

#### Statistical Science Track:

- Minimum 12 credit hours from Statistical Science Elective courses

#### Data Science Track:

- Minimum 4 credits of Statistical Science Elective courses
- Note: STSCI 5045, STSCI 5060, and STSCI 5065 cannot count as Statistical Science electives for this track

#### Additional Required Courses for Data Science Track

| Code | Title | Hours |
|---|---|---|
| STSCI 5045 | Python Programming and its Applications in Statistics | 4 |
| STSCI 5060 | Database Management and SAS High Performance Computing with DBMS | 4 |
| STSCI 5065 | Big Data Management and Analysis | 3 |

#### Statistical Science Electives (both tracks)

| Code | Title | Hours |
|---|---|---|
| STSCI 5010 | Applied Statistical Computation with SAS | 4 |
| STSCI 5040 | R Programming for Data Science | 4 |
| STSCI 5045 | Python Programming and its Applications in Statistics | 4 |
| STSCI 5050 | Modern Regression Models for Data Science | 4 |
| STSCI 5060 | Database Management and SAS High Performance Computing with DBMS | 4 |
| STSCI 5065 | Big Data Management and Analysis | 3 |
| STSCI 5090 | Theory of Statistics | 4 |
| STSCI 5100 | Statistical Sampling | 4 |
| STSCI 5111 | Multivariate Analysis | 4 |
| STSCI 5140 | Applied Design | 4 |
| STSCI 5160 | Categorical Data | 3 |
| STSCI 5520 | Statistical Computing | 4 |
| STSCI 5270 | Introduction to Survival Analysis and Loss Models | 3 |
| STSCI 5550 | Applied Time Series Analysis | 4 |
| STSCI 5600 | Integrated Ethics in Data Science | 2 |
| STSCI 5610 | Data Science in Risk Modeling | 2 |
| STSCI 5630 | Operations Research Tools for Financial Engineering | 4 |
| STSCI 5640 | Statistics for Financial Engineering | 4 |
| STSCI 5740 | Data Mining and Machine Learning | 4 |
| STSCI 5750 | Understanding Machine Learning | 4 |
| STSCI 5780 | Bayesian Data Analysis: Principles and Practice | 4 |
| STSCI 6520 | Statistical Computing I | 4 |
| STSCI 6780 | Bayesian Statistics and Data Analysis | 3 |

#### Additional Approved Electives

- Note: These courses count toward the 30 required credits but do not fulfill Statistical Science Elective requirements.

| Code | Title | Hours |
|---|---|---|
| AEM 7100 | Econometrics I | 3 |
| BIOCB 6381 | Biomedical Data Mining and Modeling | 3 |
| BIOCB 6840 | Computational Genetics and Genomics | 4 |

| | | |
|---|---|---|
| CS 5740 | Natural Language Processing | 3-4 |
| CS 5780 | Introduction to Machine Learning | 4 |
| ORIE 5160 | Topics in Data Science and OR | 3 |
| ORIE 5510 | Introduction to Engineering Stochastic Processes I | 4 |
| ORIE 5580 | Simulation Modeling and Analysis | 4 |
| ORIE 5581 | Monte Carlo Simulation | 2 |
| ORIE 5600 | Financial Engineering with Stochastic Calculus I | 4 |
| ORIE 5610 | Financial Engineering with Stochastic Calculus II | 4 |
| ORIE 5741 | Learning with Big Messy Data | 4 |
| ORIE 6500 | Applied Stochastic Processes | 4 |
| ORIE 6741 | | |

# University Graduation Requirements Requirements for All Students

In order to receive a Cornell degree, a student must satisfy academic and non-academic requirements.

## Academic Requirements

A student's college determines degree requirements such as residency, number of credits, distribution of credits, and grade averages. It is the student's responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing their chosen program of study. See the individual requirements listed by each college or school or contact the college registrar's office (https://registrar.cornell.edu/service-resources/college-registrar-directory/) for more information.

## Non-academic Requirements

**Conduct Matters**. Students must satisfy any outstanding sanctions, penalties or remedies imposed or agreed to under the Student Code of Conduct (Code) or Policy 6.4. Where a formal complaint under the Code or Policy 6.4 is pending, the University will withhold awarding a degree otherwise earned until the adjudication process set forth in those procedures is complete, including the satisfaction of any sanctions, penalties or remedies imposed.

**Financial Obligations**. Outstanding financial obligations will not impact the awarding of a degree otherwise earned or a student's ability to access their official transcript. However, the University may withhold issuing a diploma until any outstanding financial obligations owing to the University are satisfied.

# Learning Outcomes

Upon completion of the MPS degree, students will have

- Demonstrated mastery of basic statistical theory and methods.
- Developed proficiency in the use of statistical software.
- Achieved breadth and diversity of knowledge through elective courses.
- Demonstrated the ability to creatively use statistical methods to solve real-world problems.
- Demonstrated the ability to work in teams.
- Demonstrated a proficiency in oral and written communication skills appropriate for a career in industry.