STATISTICS (GRADUATE FIELD)

Program Website (http://www.stat.cornell.edu/)

Field Description

The field of statistics offers two graduate degree programs: an M.S./Ph.D. degree in statistics and a master of professional studies degree in applied statistics. The field does not offer a master's degree in statistics.

The Ph.D. program is intended to prepare students for a career in research and teaching at the university level or in equivalent positions in industry or government. A Ph.D. degree requires writing and defending a dissertation. Students graduate this program with a broad set of skills, from the ability to interact collaboratively with researchers in applied fields, through the formulation and computational implementation of novel statistical models and methods, to demonstrating mathematically that these methods have desirable statistical properties. Cornell's Ph.D. alumni have gone on to high profile positions in all of academia, industry, and government.

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.

M.P.S. or M.S./Ph.D.

Statistics does not offer admission for those interested a terminal master's degree, but we do offer admission for those interested in pursuing a master's leading to a Ph.D. We also offer the M.P.S. in applied statistics, which is normally a one-year program that does not carry financial aid.

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.).

The admissions procedures are completely independent: At Cornell, if you want to go on for a Ph.D. after the M.P.S. you must to apply as a new student to the Ph.D. program; you would be considered as part of the "pool" of Ph.D. applicants and, if admitted, you might be able to apply some of your M.P.S. coursework, but there is no guarantee. The Ph.D. in statistics at Cornell enrolls about seven to 10 students each year; the M.P.S., about 60 to 70.

If you are applying for the M.P.S. applied statistics program, let us know if you're interested in Option I or Option II.

The master of professional studies in applied statistics offers two options for specialization: Option I, the "traditional" M.P.S. program, and Option II, the data science option, which began in 2008. About 60% of M.P.S. students select Option I. Option II contains all of the requirements of Option I with additional training in computer science to prepare students to deal more effectively with the new challenges imposed by the explosion of data resources. Ideally, applicants for Option II are computer science majors, but applicants who have had significant exposure to computer science-related fields are also considered. Most Option I students take as electives some or all of the core courses designed for Option II.

Please see our M.P.S. Degree Requirements and Regulations page for information about the M.P.S. degree requirements, including required courses for both options.

Data and Statistics

- Professional Master's Program Statistics (https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/professional-masters-program-statistics/?SelectGradField=94)
- Doctoral Program Statistics (https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/doctoral-program-statistics/?SelectGradField=94)

Field Manual

- Manual (https://stat.cornell.edu/academics/phd)

Degree Programs

- Applied Statistics (MPS) (https://catalog.cornell.edu/programs/applied-statistics-mps-as/)
- Statistics (PhD) (https://catalog.cornell.edu/programs/statistics-phd/)

Concentrations by Subject

Applied Statistics

- applied statistics

Statistics

- biometry
- decision theory
- econometrics
- engineering statistics
- experimental design
- mathematical statistics
- probability
- sampling
- social statistics
- statistical computing
- stochastic processes

Faculty

Samprit Banerjee (http://gradschool.weill.cornell.edu/faculty/samprit-banerjee)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: statistical computing

Sumanta Basu (http://www.stat.cornell.edu/people/faculty/sumanta-basu)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry; mathematical statistics; statistical computing
- **Research Interests**: high dimensional statistics time series, graphical models, genomics and financial econometrics

David S. Bindel (http://www.cs.cornell.edu/~bindel)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: engineering statistics; statistical computing; stochastic processes
- **Research Interests**: Applied numerical linear algebra, Scientific computing, High-performance computing, Spectral network analysis methods, Fast methods in Gaussian processes, Optimization via surrogate models, Finite element analysis, Computational plasma physics. Computational tools for electrical power grids, Simulation tools for micro-electro-mechanical systems (MEMS)

James G. Booth (http://cals.cornell.edu/james-g-booth)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: experimental design; mathematical statistics; statistical computing
- **Research Interests**: computer intensive methods; generalized linear models; Monte Carlo simulation; statistical genomics

Jelena Bradic (http://www.jelenabradic.net/)

- **Campus:** Ithaca
- **Concentrations:** *Statistics:* biometry; decision theory; econometrics; mathematical statistics
- **Research Interests:** Data Science, Artificial Intelligence, Asymptotic Statistics, Causal Inference, High-dimensional Statistics, Machine Learning, Model Selection

Florentina Bunea (http://stat.cornell.edu/people/faculty/florentina-bunea)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: decision theory; mathematical statistics; probability
- **Research Interests**: high dimensional modeling; sparsity; model selection; model averaging; non-parametric statistics; machine learning

Yun-chien Chang (http://www.lawschool.cornell.edu/faculty-research/faculty-directory/yun-chien-chang/)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Statistics*: econometrics
- **Research Interests**: Private Law (particularly Property Law), Land Use Regulation, Economic Analysis of Law, Empirical Legal Studies of Judicial Systems

Jim Dai (http://www.orie.cornell.edu/faculty-directory/jim-dai)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: probability
- **Research Interests**: Stochastic processing networks Fluid and di usion models of queueing networks Impulse, singular and drift controls of di usions Customer contact center management Patient flow management in hospitals Semiconductor wafer manufacturing Revenue management Algorithm trading, order book dynamics

Christopher Matthew De Sa (https://stat.cornell.edu/people/christopher-de-sa)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: engineering statistics; statistical computing
- **Research Interests**: algorithmic, software and hardware techniques for high performance data analytics, data analytics and machine learning

Thomas J Diciccio (http://stat.cornell.edu/people/faculty/thomas-diciccio)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: econometrics; mathematical statistics
- **Research Interests**: likelihood inference; resampling methods; asymptotic approximations; linear models

Raaz Dwivedi (http://www.orie.cornell.edu/faculty-directory/raaz-dwivedi)

- **Campus**: Cornell Tech (NYC)
- **Concentrations**: *Statistics*: econometrics; mathematical statistics; sampling; statistical computing
- **Research Interests**: Causal inference, reinforcement learning, Bayesian inference, random sampling, and high-dimensional statistics

Ahmed El Alaoui (http://stat.cornell.edu/people/faculty/ahmed-el-alaoui)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: decision theory; engineering statistics; experimental design; mathematical statistics; probability; sampling; statistical computing; stochastic processes
- **Research Interests**: High-dimensional phenomena in statistics and probability theory, statistical physics, algorithms, and problems where these areas meet.

Jeremy Entner (https://stat.cornell.edu/people/jeremy-entner)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Statistics*: mathematical statistics
- **Research Interests**: Ranking and Selection, Statistics Education

Daniel Fink (http://www.birds.cornell.edu/home/staff/daniel-fink/)

- **Campus**: Ithaca - (Minor Member)
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: statistical computing
- **Research Interests**: Statistics, Machine Learning, Spatial Statistics, Exploratory Analysis, Semiparametric Regression, Predictive Analytics, Data Analysis, Observational data, crowd sourced Data, and Citizen Science

Peter Frazier (http://www.orie.cornell.edu/faculty-directory/peter-frazier)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: probability
- **Research Interests**: Optimal learning, sequential decision-making under uncertainty, and machine learning, focusing on applications in simulation optimization, design of experiments, materials science, e-commerce and medicine.

Sainyam Galhotra (http://sainyamgalhotra.com/)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: econometrics; experimental design
- **Research Interests**: Causal Inference, Data Science, Responsible Analytics

Kyra Gan (http://tech.cornell.edu/people/kyra-gan/)

- **Campus**: Cornell Tech (NYC)
- **Concentrations**: *Statistics*: decision theory; experimental design
- **Research Interests**: Clinical trial design, robust and efficient inference and causal discovery, and fairness in treatment outcomes

Ziv Goldfeld (http://www.ece.cornell.edu/faculty-directory/ziv-goldfeld)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: mathematical statistics; statistical computing
- **Research Interests**: Focuses broadly on optimal transport, information theory, mathematical statistics, and statistical learning theory. More specific interests include: Statistical divergences and optimal transport theory: fundamentals and applications to inference and learning Information theory Privacy and security High-dimensional and nonparametric statistics

Deanna Jannat-Khah (http://vivo.weill.cornell.edu/display/cwid-dej2008)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry
- **Research Interests**: Epidemiology Biomedical Applications

Thorsten Joachims (http://infosci.cornell.edu/content/joachims)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: engineering statistics; mathematical statistics; statistical computing
- **Research Interests**: machine learning; text-mining; statistical learning theory; information access

Nathan Kallus (http://www.orie.cornell.edu/faculty-directory/nathan-kallus)

- **Campus**: Cornell Tech (NYC)
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: decision theory; experimental design; mathematical statistics
- **Research Interests**: optimization under uncertainty, casual inference, machine learning, personalization, online decision making

Kengo Kato (http://stat.cornell.edu/people/faculty/kengo-kato)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: mathematical statistics; stochastic processes
- **Research Interests**: mathematical statistics, econometrics

David Kent (https://stat.cornell.edu/people/david-kent)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry; mathematical statistics; statistical computing
- **Research Interests**: measurement error, nonparametric estimation, functional data analysis

Jaehee Kim (http://cals.cornell.edu/jaehee-kim)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry; stochastic processes
- **Research Interests**: General fields of population genetics and evolutionary biology. Application of statistical methods and mathematical models to understand evolutionary processes and population dynamics. Evolution, biomedical, legal, and social implications in areas such as genetic epidemiology, cancer evolution, conservation genomics, and forensic genetics.

Dan Kowal (http://stat.cornell.edu/people/faculty/dan-kowal)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry; decision theory; econometrics; engineering statistics; sampling; social statistics; statistical computing
- **Research Interests**: Bayesian statistics; time series; functional data; spatial data; missing data; regression; statistical computing; prediction

Amy Frances Kuceyeski (http://stat.cornell.edu/)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: statistical computing
- **Research Interests**: statistical modeling and machine learning in neuroimaging and neurology

MyungHee Lee (http://directory.weill.cornell.edu/person/profile/myl2003)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry
- **Research Interests**: statistical bioinformatics, global health, biomedical statistics, epidemiology

Thomas Loredo (http://astro.cornell.edu/thomas-loredo)

- **Campus**: Ithaca - (Minor Member)
- **Concentrations**: *Statistics*: statistical computing
- **Research Interests**: poisson processes; marked point processes; gaussian processes; astrostatistics; astroinformatics; bayesian statistics; bayesian computation; bayesian experimental design; functional data analysis; statistical software development

Himel Mallick (https://mallicklab.weill.cornell.edu/team/himel-mallick)

- **Campus:** Weill Cornell Medicine - (Minor Member)
- **Concentrations:** *Applied Statistics:* applied statistics; *Statistics:* biometry; statistical computing
- **Research Interests:** Statistical Machine Learning, Biomedical Data Science, Multimodal AI, Bayesian Statistics, and Computational Biology.

David Matteson (https://stat.cornell.edu/people/david-s-matteson-0)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: biometry; econometrics; engineering statistics; mathematical statistics; social statistics; statistical computing; stochastic processes
- **Research Interests**: financial econmetrics; non parametric statistics; spatio-temporal statistics; biostatistics; machine learning

Jason G. Mezey (http://mezeylab.cb.bscb.cornell.edu/)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry; statistical computing
- **Research Interests**: quantitative genetics/genomics; statistical genetics; computational biology; pathway modeling; molecular evolution

Francesca Molinari (http://economics.cornell.edu/francesca-molinari)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: econometrics; mathematical statistics; sampling
- **Research Interests**: econometrics; identification; survey methodology

Yang Ning (http://stat.cornell.edu/people/faculty/yang-ning)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: mathematical statistics; statistical computing
- **Research Interests**: high dimensional statistics semi parametrics, causal inference

Kevin C Packard (http://stat.cornell.edu/people/faculty/kevin-packard)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Statistics*: biometry
- **Research Interests**: Forest biometrics, statistics education

Gennady Samorodnitsky (http://www.orie.cornell.edu/faculty-directory/gennady-samorodnitsky)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: engineering statistics; probability; stochastic processes
- **Research Interests**: probability theory

Soroosh Shafieezadeh Abadeh (http://www.orie.cornell.edu/faculty-directory/soroosh-shafiee)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: decision theory; mathematical statistics
- **Research Interests**: decision theory, mathematical statistics

Melissa Smith (http://stat.cornell.edu/people/faculty/melissa-smith)

- **Campus**: Cornell ILR NYC - (Divisional Member)
- **Concentrations**: *Statistics*: biometry

Philippe Sosoe (https://math.cornell.edu/philippe-sosoe)

- **Campus:** Ithaca
- **Concentrations:** *Statistics*: mathematical statistics; probability.
- **Research Interests:** probabilistic models inspired by statistical mechanics; percolation and its variants; random matrix theory; spin systems; analytic methods; partial differential equations

Karthik Sridharan (http://www.cs.cornell.edu/~sridharan/)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: probability
- **Research Interests**: Machine Learning, Statistical Learning Theory, Online Learning and Decision Making, Optimization, Empirical Process Theory, Concentration Inequalities, Game Theory

Felix Thoemmes (http://www.human.cornell.edu/people/fjt36)

- **Campus**: Ithaca - (Minor Member)
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: social statistics
- **Research Interests**: Propensity scores Missing data Causal Inference Structural equation modeling

Fei Wang (http://wcm-wanglab.github.io/)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: decision theory; engineering statistics; statistical computing
- **Research Interests**: Statistical machine learning for biomedical data analysis

Y. Samuel Wang (http://stat.cornell.edu/people/faculty/y-samuel-wang)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: mathematical statistics; social statistics; statistical computing
- **Research Interests**: Graphical Models, Machine Learning, Causal Discovery, High-dimensional Statistics

Marten Wegkamp (http://stat.cornell.edu/people/faculty/marten-wegkamp)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: mathematical statistics
- **Research Interests**: classification; copulas; empirical processes; high dimensional models; model selection; non parametric estimation; penalized empirical risk minimization

Kilian Quirin Weinberger (http://www.cs.cornell.edu/~kilian/)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: statistical computing
- **Research Interests**: machine learning with a focus on metric learning, high dimensional data analysis, resource efficiency and learning scenarios that are used in web a biomedical applications

Martin Timothy Wells (https://stat.cornell.edu/people/martin-t-wells)

- **Campus**: Ithaca
- **Concentrations**: *Applied Statistics*: applied statistics; *Statistics*: biometry; decision theory; econometrics; mathematical statistics; sampling
- **Research Interests**: Bayesian statistics; decision theory; empirical legal studies; epidemiology; social statistics; statistical bioinformatics; survival analysis

Yuchen Wu (http://www.engineering.cornell.edu/people/yuchen-wu/)

- **Campus:** Ithaca
- **Concentrations:** *Statistics:* decision theory; mathematical statistics; sampling; stochastic processes
- **Research Interests:** Sampling in statistics and generative AI, High-dimensional statistical inference, Algorithm design under constraints, Data-driven decision making, Random matrix theory, Mechanism design

Xiaolong Yang (http://stat.cornell.edu/people/faculty/xiaolong-yang)

- **Campus**: Ithaca - (Divisional Member)
- **Concentrations**: *Applied Statistics*: applied statistics
- **Research Interests**: proteomics and bioinformatics

Dana Yang (http://stat.cornell.edu/people/faculty/dana-yang)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: decision theory; mathematical statistics; probability
- **Research Interests**: The broad area of high-dimensional statistics and machine learning, including random network analysis, optimality analysis, Bayesian analysis, oracle inequalities, nonparametric estimation, convergence analysis for algorithms, rapidly mixing Markov chains, ethics and safety in machine learning

Christina Lee Yu (http://www.orie.cornell.edu/faculty-directory/christina-lee-yu)

- **Campus**: Ithaca
- **Concentrations**: *Statistics*: engineering statistics; statistical computing
- **Research Interests**: algorithms, statistics and machine learning, data science