



Yale SCHOOL OF MANAGEMENT

MBA Syllabus

Course Information

Course Number: MGT 403 01-05

Course Title: Probability Modeling and Statistics

Term and Year: Fall 2019

Class meeting Time, Day:

Blue Cohort: Room 4420 - Tue - Thur 10:10am - 11:30am

Gold Cohort: Room 4200 - Mon - Wed 1:00pm - 2:20pm

Red Cohort: Room 4420 – Tue - Thur 02:40pm - 04:00pm

Silver Cohort: Room 4200 – Mon - Wed 10:10am - 11:30am

Green Cohort: Room 4420 – Tue - Thur 1:00pm - 2:20pm

Course support: Email somcoursesupport@yale.edu

Contact Information

Professor(s)

Part I: Probability Modeling

Name: Nils Rudi (Blue/Green/Red)

Office Location: 3546

Telephone Number: 203-768-7908

Email Address: nils.rudi@yale.edu

Office hours: By appointment

Name: Ed Kaplan (Gold/Silver)

Office Location: 3550

Telephone Number: 203-432-6031

Email Address: edward.kaplan@yale.edu

Office hours: By appointment

Part II: Statistics

Name: Katja Seim (Blue/Green/Red)

Office Location: 3520

Telephone Number: 203-432-5487

Email Address: katja.seim@yale.edu

Office hours: Wed 1:30 – 3:00 pm

Name: Jonathan Feinstein (Gold/Silver)
Office Location: 3556
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Office hours: Wed 2:30 – 4 pm and by appointment

TA(s)
Name:

Lead TA:

Name: Frank Shaw
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Blue Cohort:

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Review Sessions:
PROBABILITY (To be arranged by TAs)

Day	Date	TA Office Hours	Room	TA Workshops	Room

STATISTICS

	Blue/Gold/Red	Silver/Green
Workshops		
Office Hours		

Final Review		

Workshops within the same week will be identical.

Course Material

Textbooks: No textbook required

Here are some suggested books if you would like to learn more about the topics covered in this course.

For Probability:

1) Introduction to Probability, Second Edition, by Charles Grinstead and J. Laurie Snell. A comprehensive introduction to probability with many examples but requires knowledge of calculus.

2) Fundamentals of Applied Probability Theory, by Alvin Drake. Also requiring calculus, this book provides a very physical introduction to probability. Calculus required for some but not all of the material.

3) Applied Probability: Models and Intuition by Arnold Barnett. Loaded with terrific, real examples. Calculus required for some but not all of the material.

For Statistics:

1) Cartoon Guide to Statistics by Larry Gonick and Woollcott Smith. It covers the material in probability and statistics in a nice intuitive way. Used in other programs (e.g. Harvard Kennedy School). Listed on [Amazon.com](https://www.amazon.com) for \$12.

2) Statistics, 4th Edition by David Freedman, Robert Pisani, and Roger Purves. Very nice introductory book, covering basic material: basics of means, medians, differences in means, and basics of regression. Listed on [Amazon.com](https://www.amazon.com) for \$128

3) Introductory Econometrics: A Modern Approach (with Economic Applications Online, Econometrics Data Sets with Solutions Manual Web Site Printed Access Card), by Jeffrey Wooldridge. Contains all the material covered in Statistics on regression as well as more advanced material. Used in many undergraduate and some masters courses. Good solutions manual. All the datasets and analysis are in Stata. Listed on [Amazon.com](https://www.amazon.com) for \$166.

4) How to Lie with Statistics by Darrell Huff and Irving Geis (Paperback - Oct 17, 1993)
Old but great book on how to think critically about statistics and how statistics is reported in the media. Has good examples on the difference between correlation and causality between two variables. Listed on [Amazon.com](https://www.amazon.com) for \$6.

For STATA:

1) A Gentle Introduction to Stata, Third Edition by Alan C. Acock. Covers all the procedures described in the Stata Training Tutorial and most the material covered in the Statistics part of MGT 403: test of means, proportions, multiple regression, etc. Does a good job of bridging the gap between Stata and Statistics. Listed on [Amazon.com](https://www.amazon.com) for \$70.

2) Data Analysis Using Stata, Second Edition by Ulrich Kohler and Frauke Kreuter. It covers more advanced data analysis techniques and how to program in Stata. Listed on [Amazon.com](https://www.amazon.com) for \$50.

Software: The probability part of the course will use Microsoft Excel. The statistics part of the course will use STATA.

Course Description and Objectives

Course Description: Probability and statistics are fundamental to management education. This course introduces you to these subjects in two parts. The first seven sessions (taught by Nils Rudi and Ed Kaplan) introduce probability modeling with Excel as the only software. The second eight sessions (taught by Katja Seim and Jonathan Feinstein) cover hypothesis testing & confidence intervals (3 sessions) and regression (5 sessions), with a mixture of lectures/concepts and hands-on examples with STATA. Assignments, readings, in-class handouts, and lecture notes will be posted on the course website. There is no textbook for this course; suggested references are listed below. Applications of the methods taught in this course will surface in your core courses and electives, and will prove useful for decision-making applications in financial analysis, marketing, economics, operations and human resource management, policy modeling, strategy, and other areas.

Course Objectives: The course introduces you to probability and statistics in sufficient depth for you to apply these tools throughout your MBA career and beyond.

Course Requirements

There will be regular homework assignments (posted on our CANVAS website with the due dates shown below).

Your course grade will be a 50/50 weighting of your Probability Grade and your Statistics Grade.

For each Probability homework, only 1 or 2 randomly sampled problems will be graded (although solutions for all problems will be posted). Late homework

submissions will not be accepted, and a grade of ZERO will be recorded for late/missed homework.

Your Probability Grade will be determined in the following manner:

GRADE1 = 20% (Homework) + 80% (Exam)

GRADE2 = 100% (Exam)

PROBABILITY GRADE = maximum {GRADE1, GRADE2}

Note that submitting homework is not required. However, submitting homework can only raise your grade beyond one based solely on the exam. In addition, it is empirically true that those who submit regular homework assignments do better on the exams. Homework is important!

Your Statistics Grade is determined as follows:

The three homework scores are added and the total score counts 25%

EXAM counts 75%

Your FINAL COURSE GRADE = 50% (PROBABILITY GRADE) + 50% (STATISTICS GRADE).

Please see the [Yale SOM Grading Policy](#)

Descriptions of Assignments/Projects/Problem sets

Exams

There will be a final probability exam on Thursday, September 19th 6:00 pm – 8:30 pm and a statistics exam on Monday, October 14th, 2:00pm - 5:30 pm.

Due Dates for Homework Assignments

All probability problem sets will be collected in a clearly marked cohort boxes located AASL (Room 2540).

Assignment	Due Date
Probability Problem Set 1	Tuesday, Sept. 3, 4:30 pm
Probability Problem Set 2	Thursday, Sept. 12, 4:30 pm
Probability Problem Set 3	Tuesday, Sept. 17, 4:30 pm
Statistics Problem Set 1	Monday, Sept. 30, 4:30 pm
Statistics Problem Set 2	Monday, Oct. 7, 4:30 pm
Statistics Problem Set 3	Thursday, Oct. 10, 4:30pm

Yale School of Management Policies

Please see the [Yale School of Management Bulletin](#) for Rights and Responsibilities of students and for information on requesting course recording.

Laptop and Device policy

Usage is not allowed without the express permission of the instructor

Detailed Outline of Class Sessions

Date	Topic	Instructor
Mon. Aug 26	Probability Experiments	Ed Kaplan
Tue. Aug 27	Probability Experiments	Nils Rudi
Wed. Aug 28	Probability Modeling	Ed Kaplan
Thur. Aug 29	Probability Modeling	Nils Rudi
Fri. Aug 30	Random Variables	Ed Kaplan
Tue. Sept 3	Random Variables	Nils Rudi
Wed. Sept 4	Binomial Distribution	Ed Kaplan
Thur. Sept 5	Binomial Distribution	Nils Rudi
Mon. Sept 9	Normal Distribution	Ed Kaplan
Tue. Sept 10	Normal Distribution	Nils Rudi
Wed. Sept 11	Sums of Random Variables and Covariance	Ed Kaplan
Thur. Sept 12	Sums of Random Variables and Covariance	Nils Rudi
Mon Sept 16	Central Limit Theorem and Sampling Distributions	Ed Kaplan
Tue Sept 17	Central Limit Theorem and Sampling Distributions	Nils Rudi
Wed Sept 18	Confidence intervals, Hypothesis Testing & Estimation: I	Jonathan Feinstein

Thur Sept 19	Confidence intervals, Hypothesis Testing & Estimation: I	Katja Seim
Thur. Sept 19	In-class probability exam (6:00-8:30 pm)	Ed Kaplan/Nils Rudi
Mon Sept 23	Confidence intervals, Hypothesis Testing & Estimation: II	Jonathan Feinstein
Tue Sept 24	Confidence intervals, Hypothesis Testing & Estimation: II	Katja Seim
Wed Sept 25	Confidence intervals, Hypothesis Testing & Estimation: III	Jonathan Feinstein
Thur Sept 26	Confidence intervals, Hypothesis Testing & Estimation: III	Katja Seim
Fri Sept 27	Introduction to Regression: I	Jonathan Feinstein
Fri Sept 27	Introduction to Regression: I	Katja Seim
Mon Sept 30	Introduction to Regression: II	Jonathan Feinstein
Tue Oct 1	Introduction to Regression: II	Katja Seim
Wed Oct 2	Multivariate Regression	Jonathan Feinstein
Thur Oct 3	Multivariate Regression	Katja Seim
Mon Oct 7	Multivariate Regression, including Dummy Variables	Jonathan Feinstein
Tue Oct. 8	Multivariate Regression, including Dummy Variables	Katja Seim
Wed Oct 9	Issues in Regression: Causality versus Correlation	Jonathan Feinstein

Thur Oct 10	Issues in Regression: Causality versus Correlation	Katja Seim
Mon Oct 14	In-class Statistics Exam 2:00 pm – 5:30 pm	Katja Seim/Jonathan Feinstein

The instructor reserves the right to modify or change the course syllabus as needed during the course.