

Course Outline

RSM1382HF

Statistics for Managers

Fall, 2012 – Section A, 64 students

Course Meets: Mon-Fri/ 8:30-10:30am, Term Duration: 10 weeks

Instructor: Dr. Sami Najafi, Room 411
E-Mail: sami.najafi@rotman.utoronto.ca
Homepage: <http://sami-najafi.com/home>
Phone (Fax): 416.946.0895
Office Hours: By appointment

Course Goals

Our goal from this course is to:

1. Become more comfortable with uncertainty
2. Learn how to quantify and present uncertainty
3. Learn the right questions to ask when presented with a data analysis
4. Learn to use Excel to do the data analysis

Practically speaking, by the end of the course you should be able to:

1. Interpret a marketing survey
 - Should we go for the full scale operation?
2. Determine whether men are significantly better paid than women
 - Or does it depend on other factors?
3. Understand and calculate Betas of stocks
4. Analyse how e.g. advertising affect sales
5. Understand how uncertainty of stocks can affect portfolio selection

The other courses that this course is most relevant to include:

1. Marketing Management
2. Decision Models, Operations Management
3. Corporate Finance, Investment Management, Financial Engineering

Course Scope and Mission

The objectives of this course are to provide the statistical foundations required to make informed decisions, backed up by data, and acquire concepts to enable you to understand topics, such as corporate risk, sampling error and forecasting, which are encountered later in the program.

Concepts of variance, covariance and correlation form a corner stone of portfolio analysis. The aim is to give you intuitive confidence in the use of statistical techniques, leaving the computational aspects to the computer, and to make you a critical user of analyses undertaken by others. The course will include many hands-on sessions with statistical software. The emphasis throughout the

course is on concepts, rather than technical detail.

The first part of the course will be devoted to probability distributions, estimation (confidence intervals) and hypothesis testing. These are key concepts in statistical analysis. Because only one variable quantity is considered, these concepts come under the heading "univariate analysis". An example of where a hypothesis test could be used is in testing whether the average monthly return of a security is greater than a given risk-free rate of return.

The second part of the course concentrates on "multivariate analysis" because the focus is on relationships between several variables. For instance, do the returns on a certain stock move in line with market returns?

In general, the main topics to be reviewed include:

- Common probability distributions, such as normal, and binomial
- Analysis of sample data, including estimation, confidence intervals, deciding on sample size
- Detecting relationships in data, and estimating their regression equations
- Covariance, correlation, and regression analysis

Course Format

The course consists of classroom sessions, exercises (encouraged to be done in small groups), practical case studies with excel as well as readings and exercises to be undertaken individually. Classroom sessions introduce ideas and approaches for tackling real-world problems. Every two weeks students are handed a set of tutorial exercises to answer in small groups. The solutions for each exercise set are given out and discussed in class in two weeks. Practical computer excel cases are conducted either in the class using your own laptops (or in a PC lab given availability) with me and (probably) a tutor to help you with each case. The software used will be Microsoft Excel, and @Risk.

Please do not hesitate to contact me (sami.najafi@rotman.utoronto.ca), if you need to discuss anything.

Optional Readings

The basic readings are from the textbook "Quantitative Methods for Decision Makers", by M. Wisniewski (FT Prentice-Hall, 5th edition). Reading the book before each session is not necessary, but encouraged. The Lecture slides, exercise sets, and other workshop practical case exercises are distributed at the beginning of each session and are later posted on the course-room (given availability) or my own webpage.

Scholar Sessions

In addition to the main lectures, there are 10 scholar sessions held every Tuesday from 4:30pm to 5:30pm at LL1060 in which Justin Chan (my appointed scholar and a second-year Rotman MBA student) will solve extra practice problems designated for that week. Attending the scholar sessions is not obligatory but is recommended. The extra practice problems (together with solutions) will also be posted in R-World (Rotman internal course-room).

Evaluation and Grades

Grades are a measure of the performance of a student in individual courses. Each student shall be judged on the basis of how well he or she has command of the course materials.

		<i>Due Date</i>
One quiz	5%	Nov 1
Group Case Write Up	15%	Nov 22
Mid Term Exam	20%	Nov 19
Individual Assignment	20%	Dec 3
Final Exam	40%	TBA

Course Work & Academic Honesty

Submission of Assignments - Students are required to use the Individual Assignment Cover Page (see RWorld) for all submitted work which will be reviewed by the Instructor. In the case of group assignments, all group members must sign the Group Assignment Cover Page.

Academic Honesty - The University's Code of Behavior on Academic Matters ("Code") applies to all Rotman students. The Code prohibits all forms of academic dishonesty including, but not limited to, cheating, plagiarism, and the use of unauthorized aids. Students violating the Code may be subject to penalties up to and including suspension or expulsion from the University. A copy of the Code may be found at: <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>

The Rotman Code of Integrity

Students are expected to conduct themselves with the utmost integrity during their time at Rotman and, without limiting the foregoing, will:

- Submit only original work, giving credit to others where appropriate;
- Neither give nor receive unauthorized aid in examinations or on assignments;
- Contribute substantially and proportionally to each group assignment;
- Ensure enough familiarity with the entire contents of group assignments so as to be able to sign off on them as original work;
- Accept and acknowledge that assignments found to be plagiarized in any way will be subject to sanctions under the University's Code of Behavior on Academic Matters;
- Represent themselves honestly to members of the Rotman community and to outsiders; and
- Represent Rotman appropriately to the outside world.

Team Behaviors & Protocols

All students are expected to treat teamwork as though they would in a business setting, ensuring professional behavior at all times. Professional behavior in group settings includes (but is not limited to) the following:

- Ensuring all team members voice their opinions, thoughts, and concerns;
- Taking personal responsibility to voice thoughts to benefit the team's learning;
- Contributing to the learning of the team by giving equal time and work quality as others in the group;
- Committing to a standard of work agreed upon by the group; and
- Participating in team projects at a level agreed upon by the entire team.

Accommodation Policy for Missed Assignments/Examinations

In the event that a student misses coursework, a course assessment or an exam due to illness, religious observance or in the case of Morning, Evening or MFin students, work commitments, the student must notify the instructor on or before the day of the missed coursework or course assessment.

The student must also submit the 'Request for Student Academic Accommodation: MBA and MFin Course Assessments and Examinations Form' to the Program Services Office along with supporting documentation as soon as possible or within 48 hours of the due date or date of the assessment, to be considered for accommodation. Once appropriate documentation has been received, the Program Services Office will evaluate the accommodation request. If approval is granted, a

resolution will be determined by the instructor and may take the form of an alternate deliverable, a re-weighted grade calculation, a make-up exam or by rewriting the exam.

Tentative Weekly Schedule

Session	Date	Topic
1	Oct 18	Descriptive Statistics Measures of Central Tendency Skeweness Measures of variability
2	Oct 18	Probability Distributions Normal Binomial Break-Out Session 1 (Solving Problems on Descriptive Statistics)
3	Oct 22	Sampling Confidence Interval
4	Oct 25	Case Workshop 1 Case1: Airline overbooking (Binomial Distribution) Case2: Profit-at-Risk (Monte Carlo Simulation using @Risk) Case3: The Firestone Case (Normal Distribution and Sampling) Case4: Sampling Distributions (Central Limit Theorem)
5	Oct 29	Discussing Firestone's Solution More on Sampling and Confidence Intervals CI when the variance is unknown t-distribution CI for the difference between two means CI for testing equality of two means
6	Nov 1	Break-Out Session 2 (Solving Problems on Sampling and Confidence Intervals)
7	Nov 5	Hypothesis Testing with a Single Sample Hypothesis Testing: CI Approach Hypothesis Testing: T - Statistics A Framework for Using Sample Data to Make Decisions Using Large Samples Types I and II Errors Small Samples P-Values One Tailed vs. Two Tailed A Recipe for HT for Means
8	Nov 8	Measuring Modeling Relationships between Two Continuous Variables Scatter Plots Measuring the Strength of the Relationship Correlation/Covariance Analysis Correlation vs. Causation Building a Simple linear Regression Model Assumptions Required for a Simple Regression Model Regression Diagnostics (Testing for Significant Relations)

9	Nov 12	Break-out Session 3 (Problems on Simple Regression) Review for Midterm Exam Review for Midterm Exam
10	Nov 15	Hypothesis Testing Part II: HT with Two Samples Paired versus Unpaired Samples Paired Data: Testing the Mean Difference Unpaired (Independent) Data: Testing the Mean Difference
11	Nov 19	Midterm Exam
12	Nov 22	Midterm Exam Solutions Discussion Case Workshop 2 Case 5: Financial Return Analysis Case 6: Delivery Times at Red Dragon Restaurant
13	Nov 26	Regression (Part II) Microsoft vs. S&P500 Example Checking Residuals More on Regression Assumptions Common Problems: Residual Non-normality Common Problems: Non-constant Variance (Heteroskedasticity) Common Problems: Non-linear Relationship Transformations (Linearizing Non-Linear Forms) Investigating the Validity of the Regression: Outliers Investigating the Validity of the Regression: Influential Observations Overview: Correlation and Simple Regression Example: CAPM Model
14	Nov 29	Case Workshop 3 Case 7: Heating Cost Analysis (Correlation Analysis, Simple and Multiple Regressions) Case 8: General Public Electric (Non-linear Regression)
15	Dec 3	Measuring Significance and Fit of the Regression Analysis of Variance Coefficient of Determination (R-Square) Adjusted R-Square Using a Regression Model to Make Predictions Measuring Input Variable Significance Extension from simple to multiple regression Sales/Advertising Example Multi-Collinearity Model Selection
16	Dec 6	Break-out Session 4 (Problems on Multiple Regressions) Seasonal Dummy Variables Case Workshop 4 Case9: Winner PLC (Case on Multiple Regression)
17	Dec 10	Case Competition Case 10: Quality Kitchens
18	Dec 13	Case Presentations and the Winning Team (with prize!) Wrap up and summary of the Course and related courses
19	Dec 20	Final Exam