**Scheller College of Business at Ga Tech**

**Quantitative Analysis for Business MGT 2255**

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**Text Book**

# Spreadsheet Modeling and Decision: A Practical Introduction to Management Science by Cliff T. Ragsdale. Published by Cengage, 7-th edition,2014 ISBN-13: 978-1285418681,ISBN-10: 1285418689

**Required Materials:**

**Laptop with Microsoft Excel** for every class. Georgia Tech in coordination with Microsoft provides Office 365 Pro Plus **for free**. It is a full version Office available for offline use. You can install Office on up to five machines. Please, if you don’t have Excel in your Laptop yet, check the website: <http://office365.gatech.edu>

**Technical Skills**

Basic proficiency in MS Excel is required.

**Lynda Online Learning Resources**

All Georgia Tech students have free access to Lynda online learning resources, which is a professional online learning website that normally requires a paid subscription. There are hundreds of videos just on Excel. To log in, go here: <http://lynda.gatech.edu/>

Once logged in you can see a search for Excel-related videos here: <https://www.lynda.com/Excel-training-tutorials/192-0.html>

This list of videos can be filtered for “business” and “beginner”, as well as many other filters: <https://www.lynda.com/Excel-training-tutorials/192-0.html?category=business_29%2cbeginner_337>

**Prerequisite**

MGT 2250 Introduction to Management Statistics or equivalent

**Course Description**

This course focuses on business decision-making processes using quantitative concepts and techniques. The course will often employ software tools, particularly Microsoft Excel, in class discussions, cases, and assignments. Furthermore, the class discussions, cases, and assignments will exemplify diverse applications of the concepts and techniques to areas such as Supply Chain and Operations Management, Information Technology Management, Finance, Marketing, Accounting, Human Resources, and Strategy.

The material is approached from a managerial rather than technical perspective, that is, with a focus on how to apply decision technology, and how to interpret the results for guiding management action. Course will be divided into two units: Analytical Tools and Statistical Tools.

Students will achieve the following goals:

* Learning general classes of quantitative decision models and techniques.
* Developing an ability to formally and mathematically structure business problems and analyze them in a logical manner.
* Understanding sensitivity of problem information and parameters.
* Improving your ability to structure rational decision-making.
* Analyze a wide array of quantitative decision problems with the help of spreadsheet models.

This is not a course in mathematics, although mathematics is used in the course as the language for formally defining models and as means of finding solutions. The focus is on the basic structure and logic of the models, not on their mathematical details and proofs. The requirements for particular mathematical operations should be within your capability. The most important is the foundation to deal with abstract symbols and relationships in basic algebra, geometry, probability, and statistics.

Since the course relies on spreadsheets as a platform for model building, basic familiarity with Microsoft Excel is assumed. These include developing and copying formulas with relative and absolute cell addresses, using the function and chart wizards, knowing basic statistical functions.

**After successful completion of this course students will be able to:**

* Formulate and solve LP model for variety of real world problems.
* Develop a project scheduling and a critical path.
* Use the expected value criterion and Bayesian theory to arrive at a decision strategy and

describe that decision strategy.

* Categorize and analyze queuing situations in manufacturing and services.
* Set up simulation model for stochastic business problems.
* Formulate Regression model to find out relationship between two or more variables

**Course Schedule:**

This is a tentative sequence of chapters. During the semester, some minor changes may occur.

|  |  |  |
| --- | --- | --- |
|  | **UNIT I Statistical Tools (18 h)** | Chapters from Text book |
|  | **Module 1 Regression Analysis** |  |
| **Week 1,2,3** | Simple Linear regression to quantify the relationship between two variables. Regression with multiple independent variables. Interpretation of regression result. | Ch 9 |
| Inference in Multiple Regression. | Ch 9 |
| *Online Quiz 1 Multiple Regression in Excel* |  |
| Detecting and dealing with collinearity. Categorical explanatory variables. | Notes posted on T-square |
|  | **Module II Queuing Analysis &Simulation** |  |
| **Week 4,5,6** | Introduction to Queuing Analysis. Characteristics of Queuing System. | Ch 13 |
| Queuing Models. | Ch.13 |
| *Online Quiz 4 Queuing Models with Excel* |  |
| Simulation. | Ch.12 |
| Excel Take-Home Part of Test 1 (online) |  |
|  | ***TEST 1*** |  |
|  |  |  |
|  | **UNIT I Analytical Tools (27 h)** |  |
|  | ***Decision-making under certainty*** |  |
|  | **Module 2 Optimization** |  |
| **Week**  **7,8,9,10** | Introduction to Optimization. Introduction to LP. Graphical Solution. | Ch 2 |
| Using Excel’s Solver tool for solving LP problems. Sensitivity Analysis. Integer LP. | Ch 3,4 |
| *Online Quiz 2 “Sensitivity Analysis with Solver”* |  |
| Application of LP | Ch 6 |
| Excel Take-Home Part of Test 2 (online) |  |
| ***TEST 2*** |  |
|  |  |  |
|  | ***Decision-making under uncertainty*** |  |
|  | **Module 3 Decision Analysis** |  |
| **Week 11,12,13** | Payoff analysis and Utility theory. | Ch 14 |
| Decisions with information updating (Bayesian Analysis). | Ch 14 |
| *Online Quiz 3 “Bayesian Analysis”* |  |
| ***TEST 3*** |  |
| **Week 14, 15** | **Module 4 Project Management** |  |
| Project Management (PERT/CPM). PERT/Cost and Budgeting. | Ch 15 |
| Project Scheduling and Crashing. |  |
|  |  |  |
|  | ***Final Exam: Test 4*** |  |

Academic calendar: <http://www.registrar.gatech.edu/calendar/m/fall.php>,

Final exam schedule: <http://www.registrar.gatech.edu/students/exams.php>

**Grading**

**Your final grade will be assessed as follows:**

|  |  |
| --- | --- |
| **Assignment** | **Points** |
| Quiz 1 | 15 |
| Quiz 2 | 15 |
| Quiz 3 | 15 |
| Quiz 4 | 15 |
| **Test 1** | 70 |
| Excel Take-Home part of Test 1 | 30 |
| **Test 2** | 70 |
| Excel Take-Home part of Test 2 | 30 |
| **Test 3** | 100 |
| **Final Exam. Test 4** | 140 |
| Participation | 50 |
| Total | 550 |

The target assignment for letter grades will be as follows:

**A –** 495points and above;

**B –** 440 -494 points;

**C** – 385 -439points

**D** – 330 -384 points;

**F –** 329 points and below

Relationship between average test score (with any fractional average rounded up) and letter grade: 90-100%= A, 80-89.9% = B, 70-79.9% = C, 60-69.9% = D, below 60% = F.

**Homework:** To help students understand the material and prepare the exams, homework problems will be assigned. Many problems in the exams are very likely related to the homework problems. Assigned homework will not be collected and graded. The solution of homework will be posted on T-square before review session. You are encouraged to work together with other students on homework and review problems as long as you write up your own solutions.

**Tests:** There are 4 proctored tests for this course. All Tests are closed-book and individual efforts**.** Students may bring one page (8 ½ x 11 inches, two sides) of original hand-written or typed formula sheet to the Tests.

Excel Take-Home Part for Test 1 &Test 2 will be assigned and posted on T-square.

All work on the tests is to be your independent work (with you neither giving nor receiving assistance). No late Excel take-home part of test will be accepted.

I will take 2-3 class periods to return an assignment. Short test review session will be offered before each exam

**Final exam** is cumulative closed book, individual effort. Students may bring two pages (8 ½ x 11 inches, two sides) of original hand-written or typed formula sheet (note)to the final exam. Formula sheet with your first and last name will be collected with your final exam pages.

Students must have a photo ID in each exam for verification.

Students are expected to have their own calculator for each exam.

**Makeup Policy for Tests.** There will be NO makeup tests except for absences required by Georgia Tech (submit documentation). If you miss one mid-semester exam and notify me with an approved (at my discretion) absence, the weight of that exam will be added to the total weight of the other mid-semester exams so you will not have the impact of a zero for the missed exam. If you miss more than one mid-semester exam, you will receive a zero for the additional mid-semester exams you miss. Missing the final exam will result in a zero grade for the final exam.

**Name Tent.** I will attempt to learn your name as soon as possible. To help me in this effort, you will need to complete a name tent and **place it in front of you for** **EVERY CLASS (especially on Exam Days).** If you misplace your name tent, please make another one. You will not be allowed to remain in the classroom if you do not have a name tent in front of you.

**Academic Honor Code.** Georgia Tech has an Honor Code that engages both faculty and students in a pact that they will maintain and uphold the integrity of the academic process. Students in this class are expected to adhere to the Georgia Tech Honor Code. Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please see The Georgia Institute of Technology 2015-2016 Catalog at <http://www.catalog.gatech.edu>. Refer specifically to section 18b entitled “Academic Honor Code” at <http://www.catalog.gatech.edu/rules/18b.php> for the principles, policies, and procedures governing issues of academic integrity. Georgia Tech Honor Code requires that every instance of academic misconduct be reported to the Office of Student Integrity (OSI). This reporting is required even if a resolution or sanction has been agreed upon by the professor and student without a hearing with OSI. Please keep this reporting requirement in mind at all times.

**Classroom Environment.** Class does entail a certain amount of civility. The following outlines the basic rules of respectful behavior that must be followed to permit the classroom to be a positive learning experience for all. Please turn off cell phones. Please, use laptops or other electronic equipment for taking notes, displaying Power Points, or solving cases/assignments for the class; do not talk to your neighbors; and do not read anything other than the class material currently beingdiscussed.

**Communication.** For any detailed discussion of class material face-to-face communication is the most effective way of resolving questions. I am always willing to set up an appointment to answer questions. However, for administrative and logistical questions technological means can be very useful. I will make every effort to respond to emails within 36 hours of receipt Monday – Friday. Emails sent on weekends and holidays may not be answered until the following Monday or weekday.

**Special Accommodations.** Students requesting academic accommodations based on a documented disability are required to register with the Office of Disability Services.  Please obtain a form from their office and turn it in to me at the beginning of the semester.  The Office of Disability Services is located in the Smithgall Student Services Building, Suite 123.  The phone number is 404-894-2563.  <http://disabilityservices.gatech.edu/content/4/contact-us>

**Class attendance.** Class participation refers to regular class attendance; significant contribution to class discussion; and being courteous and professional to both your instructor and your fellow classmates. Contribution to class discussion will require that you prepare for the class lesson ahead of time by reading the material that is to be covered and keeping up with class cases and homework assignments. Any absence will hinder your learning and readiness for the exams. I will take the class participation at every class except the first week of classes. You will get 50 points for exemplary attendance and participation in class. Mid-term update of the participation grade will be posted on T-square. You should sign the list of attendance in the beginning of every class. If you forget to sign in the list of attendance, it means you missed the class and any additional proves of your attendance will not be considered.

In the event of absence, students are responsible for all material, assignments, and announcements presented in class.

Students who are absent because of participation in approved Institute activities (such as field trips and athletic events) will be permitted to make up the work missed during their absences. Approval of such activities will be granted by the Student Academic and Financial Affairs Committee of the Academic Senate, and statements of the approved absence may be obtained from the Office of the Registrar. Students who are absent because of participation in a particular religious observance will be permitted to make up the work missed during their absence with no late penalty, provided the student informs the course instructor of the upcoming absence, in writing, within the first two weeks of class, and provided the student makes up the missed material within the timeframe established by the course instructor. Please, use this link to read Ga Tech class attendance policy [http://www.catalog.gatech.edu/rules/4/#](http://www.catalog.gatech.edu/rules/4/).