

# 70-208: Regression and Forecasting

Spring 2017  
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*Instructor:* John Gasper  
*Office:* CMUQ 2160  
*Email:* gasper@qatar.cmu.edu

*Course Time / Location:*  
Sunday, Tuesday, Thursday: CMB 1185

Section W 09:30AM - 10:20AM;

Section X 10:30AM - 11:20AM

*Office Hours:*  
Sunday & Tuesday 1:00-2:30pm, and by appointment

In general, I have an open door policy: if my door is open and I'm not meeting with someone, you are welcome to come in and meet with me. If my door is closed, I am not available (out of the office, working, etc). On non-teaching days, I'm often quite busy with research and not available. I highly encourage you to **set up an appointment** to make sure I will be available.

*Teaching Assistants:*

TA: Tehseen Niaz (tniaz@qatar)

**office hours** TBA

CAs: Yousuf Akhlaq (yousufakhlaq@cmu)

Awais Shamim (ashamim@andrew)

*Required Textbook:*

- *Statistics for Business* by Stine and Foster

## Course Description and Goals

This course is an introduction to the widely used and powerful methods of Regression and Forecasting. Building on the foundations introduced in 70-207, this is an applied course focusing on the statistical analysis of the relationships between two or more random variables. It is my goal that at the end of the semester you will learn ways to aid managerial decision making by applying a scientific approach and quantitative analysis. Topics covered include: simple linear regression, multiple regression, prediction, variable selection, residual diagnostics, time series, and forecasting.

This is an applied course for Business Administration students and will make heavy use of actual datasets. There are many excellent software packages available to do these analyses. For this course we will use Excel with the add-in StatTools. For more advanced analyses, I highly recommend R; it is freely available, widely used, and very powerful.

## Attendance and participation

It is easy to take the attitude that your job (and mine) is accomplished with your mastery of the material of the course, and consequently that I need not bother with whether you show up for class. Realistically, we know that in general the vast majority of students who feel they don't need to come to class are mistaken, but only find that out, to their shock, as they do poorly on exams. *You learn these techniques by doing these techniques.* I will expect you in class and I expect you on time. This not an “easy” course and a large part of the lecture material will not come from the text. The exams will cover both sets of material.

This semester we will using “clickers” in the course. Once these are assigned to you, you are required to bring your clicker to every class. I will be using these to take attendance for the course. If you forget to bring your clicker and we use it that day, you will be counted as absent. If you lose your clicker, you will be counted absent for the remainder of the semester. I would *highly* encourage you to put your name on the clicker.

## Cell phones and laptops

We will be in the computer lab the entire time this semester. However, that does not mean that you should feel free to use the computer for whatever you please (facebook, checking news, problem sets for other classes). This is disrespectful to me but more importantly to your fellow students. We'll be moving at a very fast pace and it's hard to concentrate and keep up if someone near you is doing something else.

I also ask that you turn off your cell phone during class – use airplane mode. If there is an emergency and you might need to be contacted, please talk to me before class. Otherwise there should be no reason to hear a phone ring or see someone send a text. Text messages and phone calls during class are very distracting and disrespectful to me and your other students. **If you are surfing the internet, texting, etc, during class you will be asked to leave.**

## Course Logistics

This course has both a Blackboard and a Piazza site. Both sites should be set up and functioning. Handouts, problem sets, updated syllabi and announcements will be posted to Blackboard and you are responsible for checking the site regularly. The TAs and I will maintain the Piazza discussion board. If you have any questions about the techniques, problem sets, etc, ask them on the discussion board. It has been my experience that one of the best ways to learn something is to try to explain it to someone else. So I will expect you to try to answer the questions that other students ask; doing so will aid the participation element of your grade, and, while unofficial, will aid you if you're near a borderline at the end of the semester.

I welcome questions during class: if you have a question or a comment, please let me know. I will generally pause after each slide and ask if there are any questions – please feel encouraged to raise questions during class. In addition, please seek out help from the TAs. We are here to help you learn the material.

## Grades

Each student's grade for the course will be based on the following:

1. *Homework Exercises* 5%
2. *Midterm Exams* 15% each (total 45%)
3. *Comprehensive Final Exam* 30%
  - You are allowed to use the notes you take during the class on these exams. You will also be allowed the use of a basic calculator (you won't need it). **Laptops and calculators on phones (etc.) are not allowed.**
4. *Quizzes* 4% each (total 20%)

The only way to learn the material is to do it. There will be roughly seven problem sets distributed that will be graded on a “check-minus / check-plus” system where credit will be given for completing the problem set. A check will mean that you've reasonably attempted the problems; a check-plus is awarded for exemplary work (i.e., I could use it as a solution set next year) and a check-minus for a poor and deficient attempt. Solution sets will be posted and *you will be responsible for checking that your work is correct*. There will be no personal extensions to the homework deadlines because I will post the solutions right after the homework deadline. On the top of the first page of the assignment, you **must list everyone you worked with on the assignment**. Submit one PDF file to the Blackboard site, and include your name in the document and your Andrew ID within the file name, for example: ‘*Homework 1 - gasper.pdf*’

Mastery of the material will be gauged via in-class quizzes and exams. There will be five quizzes and three scheduled exams during the semester. The quiz material will be based off of material on the assigned problem sets and lectures. In addition there will be a comprehensive

final exam that will be scheduled later in the semester. The logistics for the exams are still being determined, but I prefer an applied approach to exams. Hence, the exams will almost surely be scheduled in the computer lab. Unless otherwise stated, these exams are open book / notes but no communication between students will be allowed. I generate different data for every student so it is crucial that you use the correct data for your exam; failing to do so will almost surely result in a failing grade.

I know that your schedule during the semester can be hectic. I also know that various events can happen during the semester that make finishing projects on time difficult. I also, however, expect you to know these things as well. I have a no personal extensions and no make-up policy, unless it is a university approved absence. **If you attend 90% of the classes, your lowest quiz score will be dropped when calculating your final grade.** Again, you are required to bring your clicker to every class once it is assigned. I will be using these to take attendance for the course. If you forget to bring your clicker and we use it that day, you will be counted as absent.

## Academic Integrity

You should feel encouraged to talk with your class mates about the problems on the problem sets, but do not copy even parts of someone else's work. The homework is graded on a check system to encourage you to attempt the homework yourself. ***While I highly encourage you to use the Piazza discussion site, if you speak with anyone else (including a TA/CA or the ARC) regarding the homework, I require that you list it.*** Many students also do not realize that using a homework assignment from a previous iteration of the course to aid them in attempting their problem sets is also an academic integrity violation.

The CMU-Q policy on cheating and plagiarism has been updated and I would like to point out the following text: *In all academic work to be graded, the citation of all sources is required. When collaboration or assistance is permitted by the course instructor(s) or when a student uses the services provided by Academic Development, the Global Communication Center, and the Academic Resource Center (CMU-Q), the acknowledgement of any collaboration or assistance is likewise required. This citation and acknowledgement must be incorporated into the work submitted and not separately or at a later point in time. Failure to do so is dishonest and is subject to disciplinary action.*

I am very sensitive to cheating and plagiarism; my policy is that cheating of any kind will not be tolerated. My automatic penalty for any offense is a one letter grade reduction in your final course grade. If you have any doubt about your actions, please ask me. I strongly encourage you to review Carnegie Mellon's policies regarding academic integrity.

## Weekly readings and course outline

Class	Date	Topic	Reading	Assignment
1	15-Jan	Summarizing data		
2	17-Jan	Sample Data & Uncertainty	12	
3	19-Jan	CTL & Normal Probability Model	15	
4	22-Jan	Bivariate Regression	19	PS 1 due
5	24-Jan	Bivariate Regression	19	
6	26-Jan	Curved Patterns	20	Quiz 1
7	29-Jan	Log Transformations	20	PS 2 due
8	31-Jan	Log Transformations	21	
9	2-Feb	Simple Regression Model	22	Quiz 2
10	5-Feb	Simple Regression Model	22	PS 3 due
11	7-Feb	Diagnostics	22	
12	9-Feb	Diagnostics		PS 4 due
13	12-Feb	Exam		EXAM
X	14-Feb	National Holiday - NO CLASS		
14	16-Feb	Multiple Regression	23	
15	19-Feb	Multiple Regression	23	
16	21-Feb	Model Building	24	
17	23-Feb	Model Building	24	PS 5 due
18	26-Feb	Categorical Variables	25	Quiz 3
19	28-Feb	Categorical Variables	25	
20	2-Mar	Categorical Variables	25	
X	5-Mar	SPRING BREAK		
X	7-Mar	SPRING BREAK		
X	9-Mar	SPRING BREAK		
21	12-Mar	Interactions	Handout	
22	14-Mar	Interactions	Handout	
24	16-Mar	Interactions	Handout	PS 6 due
25	19-Mar	Diagnostics and Inference	Handout	Quiz 4
26	21-Mar	Diagnostics and Inference		
27	23-Mar	Diagnostics and Inference	Handout	PS 7 due
28	26-Mar	Exam		Exam
29	28-Mar	Time Series	27	
30	30-Mar	Time Series	27	
31	2-Apr	Time Series	27	
32	4-Apr	Time Series	27	
33	6-Apr	Autoregression	27	
34	9-Apr	Autoregression	Handout	PS 8 due
35	11-Apr	Autoregression	Handout	
36	13-Apr	Autoregression	Handout	
37	16-Apr	Forecasting	Handout	Quiz 5
38	18-Apr	Forecasting	Handout	
39	20-Apr	Forecasting	Handout	
40	23-Apr	Exam		Exam
41	25-Apr	Final Review		
42	27-Apr	Final Review		
	TBA	Final Exam		



# QBA Classroom Conduct Spring 2017

**Carnegie  
Mellon  
University**  
Qatar

The Qatar Business Administration Program maintains high expectations for student classroom conduct. Your professors will hold you to these standards. We believe that these standards create an environment that is most conducive to learning. This behavior also reflects common business culture. As CMU Qatar Business Administration students, part of your business education is to model the behavior that you will demonstrate in the workplace. Your professors may add specific guidelines to some of these expectations in syllabi and course policies, but these points will be the baseline for all of your QBA courses throughout your degree pursuit.

**QBA students attend all scheduled classes.** Unless the professor explicitly states that other ways of completing the work are acceptable, you must attend all scheduled classes. If you are unable to attend class, you are expected to contact the faculty member in advance. If you miss class, you are expected to contact your professor at the first possible opportunity. It is your responsibility—not the professor’s—to ensure that any assignments, handouts, notes, etc. are obtained prior to the next scheduled class. Professors will likely add additional detail to their attendance policies, which may include grade implications. Be sure that you understand attendance policies in each of your classes.

**QBA students attend class on time.** In common business culture, punctuality is an important part of showing respect for your colleagues and business partners. Showing up late for a meeting tells the others involved that you do not place much value on their time. QBA students will demonstrate respect for their courses, classmates and professors by arriving for class early enough to get settled and prepared *before* the scheduled meeting time. The consequences of tardiness, absence from class or late work are at the discretion of the professor and may include impact on grades. Specific policies can most often be found in your syllabus. To avoid disruption, professors reserve the right to deny tardy students admission to the classroom. Faculty members are expected to be alert to absenteeism detrimental to a student’s performance and to call such cases to the attention of program administration.

**QBA students remain in class once it has begun.** Just as arriving late for a class, meeting or presentation disrupts, so, too, does leaving in the middle. Professors, managers and speakers may take it as a sign of disrespect or disinterest. You know your class schedule well in advance, so be sure to set your priorities in a way that reflects your responsibility to your educational goals. The class day provides many opportunities for breaks; you should rarely require one in the middle of a class session. In some specific instances, by the policy of your professor, exams and quizzes for example, you may not be allowed to reenter the room if you leave.

**QBA students come to class prepared.** Your professors will expect you to arrive in class prepared for that day's work. You will be expected to have completed the readings, case preparations and other assignments prior to each class session. A Tepper business education is not a passive process; to get the most from your education, you must actively engage the process at every turn. You will have many opportunities to participate in your classes in a variety of ways, and if you have not done the work, you will have little to offer. In some cases, final grades have a class participation component. You can reasonably expect "cold-calling" in some of your classes. Preparation also includes arriving with the materials that you will need. Bringing a notebook, writing implement, texts and other materials signals to your professor and classmates that you are ready to engage that day's topic; arriving empty-handed signals the opposite.

**QBA students use electronics in the classroom only for class purposes.** Laptops are to be closed. When class is in session, you may use your laptop only as directed by your professor. You should not check email, tweet, text, play games, or surf the Internet, any activity that diminishes your or your classmates' engagement with the classroom content and process. If you are unsure whether a given activity is appropriate, ask your professor. *This policy extends to all electronic devices.* Be sure that your phones and tablets are silenced and stowed before the class begins. Professors may add specific limits on the sharing or use of personal electronics in exam situations.

**QBA students adhere to the CMU Policy on Academic Integrity.** As a Carnegie Mellon University, Qatar Business Administration student, you will be held to the highest standards of academic integrity. Your professors and others will help you to fully understand what this means, but in the simplest terms, representing someone else's work as your own or helping someone else to do so violates academic integrity. For example, not crediting a source in a research paper, copying a classmate's homework and sharing answers on a quiz are plagiarism or cheating, violations of the rules of academic integrity. Providing or using unauthorized graded work and answer keys from previous course offerings constitutes "Unauthorized Assistance;" students providing the materials and students receiving the materials *both* are violating academic integrity standards. Taking credit for the work of teammates while contributing none, sometimes called "freeriding," likely violates academic integrity standards in that course. Be aware that the university policy on academic integrity, in addition to providing institution-wide standards, gives instructors the ability to determine what is appropriate in each of their courses. **It is absolutely crucial for students to know the expectations for each of their courses and to ask before they act in instances where the expectations are unclear.**

Your business faculty is dedicated to creating avenues for your academic success; we want you to get the most powerful education you can. However, should you choose to disregard university integrity standards, the faculty is committed to closely following university and campus policies for reporting violations and pursuing appropriate academic disciplinary actions. The university will tolerate no violation. Penalties can severely impact your success in a course or even progress toward your degree. Before you make a bad decision, speak to a professor and find a better path. All of your academic and behavioral responsibilities are detailed in the *Q-Word Student Handbook* and the *CMU Undergraduate Catalog*, both available online. Answers to many of your questions can be found there.