# STA 371G: Statistics and Modeling
## Fall 2017

**Session 1, 04775,   Tuesday & Thursday 11:00 AM - 12:30 PM,  Room: PAR 301**
**Session 2, 04790,   Tuesday & Thursday  2:00 - 3:30 PM,  Room: UTC 1.104**

**Instructor:** Jared S. Murray, Ph.D., Assistant Professor of Statistics
   Office: CBA 6.482 (east side of the building that faces the entrance of Gregory Gym)
   Email: `jared.murray@mccombs.utexas.edu`
   Website: `http://jaredsmurray.github.io/`
   Office Hours: Tuesday & Thursday 3:40-5:00 PM, or by appointment. Please email me
to set appointments; this ensures that I'm prepared for your visit, and that you don't waste
time trying to drop in when I'm not available.

**Teaching Assistants:**
   Rohit Arora, `arorarohit@utexas.edu`, IROM PhD Student
   Office: CBA 3.332L
   Office Hours: Wednesday 4:00 - 5:00PM and Friday TBD

**Course Website:** `https://jaredsmurray.github.io/sta371g_f17/`

**Course Description**: This course introduces statistical methods and data analysis tools
to model uncertainty and make decisions.  After a brief review of basic probability and
statistics, we will discuss decision making, regression models, and time series analysis. Sim-
ulation with statistical software will be incorporated into these topics and used throughout
the semester.  Statistical analysis and modeling will be illustrated with a large number of
real examples, such as those in finance, marketing, economics, politics, and sports. We will
analyze real datasets using the statistical software R. The techniques taught in the course
will also be useful in performing data analysis in other BBA courses.
   By the end of the course, you will be equipped with the necessary statistical knowledge
and skills to solve real-world business problems. Specifically, you will learn how to choose an
appropriate statistical model to analyze business data, perform computation with statistical
software, validate the output of the model, and draw appropriate conclusions from the
results of a statistical analysis.

**Course Communication**: The course website will be updated regularly.  I will make
announcements via Canvas. **Please make sure your Canvas is set up so that you
get notifications of announcements by email.** You are welcome to email me with
any questions, concerns, etc.  The TA is also available to answer questions about course
material, homework, or exams, but any requests for make-up exams, deadline extensions,
or other policy exceptions should be directed to me via email, not to the TA. I will respond
to emails within 24 hours.

## Materials:

- Text:

  (a) OpenIntro Statistics by Diez, Barr and Çetinkaya-Rundel, 3rd Edition, available for free at http://www.openintro.org/stat/textbook.php. This book provides a review of basic probability and statistics, as well as introductory material on linear regression.

  (b) Business cases for homework assignments and in-class demonstrations:

  1. Amore Frozen Food, UVA-QA-0317
  2. Waite First Securities, UVA-QA-0453
  3. Milk and Money, KEL343
  4. Orion Bus Industries: Contract bidding strategy, IVEY 9B03E005
  5. Oakland A's A, UVA-QA-0282
  6. Oakland A's B, UVA-QA-0283
  7. Northern Napa Valley Winery, Inc, IVEY 9A98E046
  8. Freemark Abbey, Harvard 9-181-027

  You may either purchase these cases individually online or purchase the course packet that contains all eight cases.

  (c) Other readings and class notes will be made available via Canvas and/or the course website.

- Software:

  R and RStudio (free software). I will use R for class demonstrations, and code will be available before class for you to follow along. This will help you better understand randomness and uncertainty, and practice your data analysis skills.

  The ability to code in R is a highly marketable skill and I encourage you all to avail yourselves of this chance to learn some R coding. However, your exams will **not** require you to code in R (although you will have to understand key commands and appropriately interpret its output). Your homework will require you to use some statistical software and while you are free to use the software of your choice, we will only provide support for R. Additional R resources are available on the course website.

### Tentative Course Schedule:

This schedule represents my current plans and objectives. The time spent on any particular topic may vary slightly from what is outlined below. Such changes, communicated clearly, are not unusual and should be expected.

- Weeks 1-5 (8/31-9/28): Review of probability and intro to simulation; Decision making under uncertainty
- Weeks 6-8 (10/3-10/19): Simple linear regression

- Weeks 9-12 (10/24 - 11/16): Multiple linear regression
- Week 14 (11/28 - 11/30): Forecasting and time series
- Week 15 (12/5 - 12/7): Additional topics in modeling and simulation

(Note that week 13 includes an exam and the Thanksgiving holiday.) Midterm exams will be held on **October 10** and **November 21** – see below. The final exam date will be set by the university registrar.

**Grading:**
Homework (15%)
In Class Quizzes (5%)
Midterm Exam 1 (20%)
Midterm Exam 2 (25%)
Final Exam (35%)
There are no pre-set grade cutoffs for this class.

**Homework**: You will be assigned approximately eight homework assignments throughout the semester. You may work in groups to complete homework assignments. Each group may consist of no more than three members. Each group member should turn in their own report, indicating the members of the group. Late homework is not accepted.

**In-class quizzes**: There will be approximately six short in-class quizzes, which will be graded for effort and completeness only. These quizzes are intended to be a quick way for me and you to assess your comprehension of key concepts. You will receive full credit for this portion of your grade if you thoughtfully complete at least 2/3 of the quizzes.

**Exams:**

- Midterm Exam 1 will be on Tuesday, October 10 at 7PM in room GSB 2.124.
- Midterm Exam 2 will be on Tuesday, November 21 at 7PM in room GSB 2.124.
- Both midterm exams will be held in the evening to reduce exam stress.
- The final exam is cumulative and covers basic probability and statistics, linear regression, time series, decision making, and simulation. It will be given during the University's final exam period. The specific date is determined by the University.
- Your lowest midterm exam grade will be replaced by the final exam grade (provided that the final exam grade is higher than at least one midterm exam grade).
- Clerical errors in grading will be corrected without hassle. Other regrading requests must be submitted in writing within one week (7 days) of the exam's return. Keep in mind that the entire exam will be subject to regrading.
- You may bring one, two, and three pages (8.5×11 inch, letter size) of notes and formulas to the first midterm, second midterm, and final exams, respectively.
- You may bring a calculator to the midterm and final exams.

- There is no predetermined grade distribution for this class.

**Quantitative Reasoning Flag:** This course carries the Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

**University of Texas Honor Code:** The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

**Academic Integrity:** Each student in this course is expected to abide by the University of Texas Honor Code. Any work submitted by a student in this course for academic credit will be the student's own work.

You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e-mail, an e-mail attachment file, a diskette, or a hard copy.

Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Code can also be extended to include failure of the course and University disciplinary action.

During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

**Students with Disabilities:** Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259, http://www.utexas.edu/diversity/ddce/ssd/.

**Religious Holy Days:** By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

**Policy on Scholastic Dishonesty:** The McCombs School of Business has no tolerance for acts of scholastic dishonesty. The responsibilities of both students and faculty with regard to scholastic dishonesty are described in detail in the BBA Program's Statement on

Scholastic Dishonesty at http://www.mccombs.utexas.edu/BBA/Code-of-Ethics.aspx. By teaching this course, I have agreed to observe all faculty responsibilities described in that document. By enrolling in this class, you have agreed to observe all student responsibilities described in that document. If the application of the Statement on Scholastic Dishonesty to this class or its assignments is unclear in any way, it is your responsibility to ask me for clarification. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since dishonesty harms the individual, all students, the integrity of the University, and the value of our academic brand, policies on scholastic dishonesty will be strictly enforced. You should refer to the Student Judicial Services website at http://deanofstudents.utexas.edu/sjs/ to access the official University policies and procedures on scholastic dishonesty as well as further elaboration on what constitutes scholastic dishonesty.

**Campus Safety:** Please note the following recommendations regarding emergency evacuation, provided by the Office of Campus Safety and Security, 512-471-5767, http://www.utexas.edu/safety:

- Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.

- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.

- Students requiring assistance in evacuation should inform the instructor in writing during the first week of class.

- In the event of an evacuation, follow the instruction of faculty or class instructors.

- Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.

- Behavior Concerns Advice Line (BCAL): 512-232-5050

- Further information regarding emergency evacuation routes and emergency procedures can be found at: http://www.utexas.edu/emergency.