

# STAT 303 - STATISTICAL METHODS (Section 501)

Spring 2019, Texas A&M University

**Instructor:** Dr. Moumita Karmakar

**Office:** Blocker building, fourth floor, Room 446

**Office Hours:** Monday & Wednesday 11:00 am -12:00 pm or by appointment

**Email:** [mkarmakar@stat.tamu.edu](mailto:mkarmakar@stat.tamu.edu). You should include STAT 303-501 in the subject.

**Teaching Assistant:** Shubhadeep Chakraborty

**Office:** Blocker building, fourth floor, Room 445

**Office Hours:** Thursday 10:00 am -11:00 am

**Email:** [shubhadeep@stat.tamu.edu](mailto:shubhadeep@stat.tamu.edu). You should include STAT 303-501 in the subject.

## Course meeting times and places:

Section	Day	Time	Location
501	Tuesday and Thursday	11:10 am —12:25pm	Blocker 150

## Prerequisites:

- Math 141, 147, or Math 166 or equivalent is a prerequisite.
- This course requires students to use elementary mathematics and logical reasoning.

**Help Session Hours:** You can get help with your homework and course notes in 162 Blocker. During the help session hours, graduate statistics students (at least 2) will be available to help you with your homework. The help session hours are given below.

- M/T/W/TR: 10:00 am -12:00 pm; 1:00 pm -3:00 pm; 5:00 pm - 7:00 pm

## Course website:

- All STAT 303 materials will be disseminated through Ecampus. Go to [www.ecampus.tamu.edu](http://www.ecampus.tamu.edu).
- You can also log into Howdy and find the ecampus tab on the right. All email correspondence from my side will be made via ecampus.

**Examination schedule:** There will be 2 midterm examinations and a final examination.

Exam	Date and time
I	Thursday, February 21, BLOC 150
II	Thursday, April 11, BLOC 150
Final	Thursday, May 2, 3:00pm – 5:00pm, BLOC 150

Exam 2 results will be out before your Q-drop date, Monday, April 15.

**Learning Objectives:** By the end of the semester, the student should be able to:

- Identify appropriate graphs, summary statistics, and inferential statistics for real-world contexts.
- Interpret graphs and statistics in real-world contexts.
- Calculate summary and inferential statistics.
- Infer appropriate conclusions about populations based on data.
- Explain and compare properties of summary and inferential statistics.
- Combine concepts in new ways to solve various problems.

**Time and Effort:** It should be emphasized that this course will cover a great deal of material at a rapid pace. As a rule of thumb, you should expect to spend a minimum of 2 hours for every hour spent in class reviewing material covered in lecture and homework. Students who have had difficulty in previous quantitative courses, or who have not had such a course in several semesters, may find that this course requires a considerable amount of preparation and extra study time, and should plan accordingly.

**Quizzes/Class Participation:**

- During class there will be quizzes on every Thursdays unless mentioned otherwise. I will set a classroom open book Quiz for 15 mins at the end of the Thursday's class. Quizzes will be on TopHat.
- There are **NO quiz make-ups** under any circumstances. If a student is absent, s/he will receive an automatic zero for the quiz that day.
- The two lowest quizz scores for everyone will be dropped.

**Homework:**

- Unless specified otherwise, homework will be posted every Thursday and will be due following Thursday at 11:59 pm. Homework is to be submitted online through TopHat. Details will be given in class.
- Although discussion among fellow classmates is allowed, the homeworks you submit must be your own work, consistent with the university rules on academic integrity.
- Late submissions **WILL NOT** be entertained. There will be **NO MAKEUP** homework assignments under any circumstances.
- The two lowest homework score for everyone will be dropped.

**Required materials:**

- The course notes are posted in eCampus and must be printed out and brought to each class. The lecture notes will be self-contained and you are not required to buy any book.
- Textbook: *Statistics: The Art and Science of Learning from Data*, 4th ed, by Agresti & Franklin (**not required**)
- A calculator that has a square root function, logarithm operation, and can do calculations to at least 5 decimal places is necessary. Advanced calculators are allowed but you may not use the advanced features in an exam.

- For EACH exam you will need to bring a **8.5 × 11 GRAY Scantron**. Coffee stained, torn and wrinkled sheet do not scan so they're NOT GRADED!!!
- You will need an account with [Top Hat \(https://tophat.com/\)](https://tophat.com/) to complete class quizzes and homework assignments on your phone or laptop. You can visit the Top Hat Overview (<https://success.tophat.com/s/article/ka25A0000007GUCQA2/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center, which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system. An email invitation will be sent to you by email, but if don't receive this email, you can register by simply visiting our course website: <https://app.tophat.com/e/077121>. Our Join Code is 077121. An account costs 26 for 4 months or 38 for 12 months. If you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email ([support@tophat.com](mailto:support@tophat.com)), the in app support button, or by calling 1-888-663-5491.

### Grading policy:

20% Homework
10% Quizzes
20% Each midterm exam
30% Final exam

A: 90–100%   B: 80–89.99%   C: 70–79.99%   D: 60–69.99%   F: Below 60

In case of a student having a score in a fuzzy region between two letter grades, the following will be taken into consideration: (1) consistency in submitting homework assignments, (2) level of participation in class activities, and (3) improvement in examination scores as the semester progresses. Once the final exam grades have been calculated and submitted, I will not change any grades unless I've made a grading error.

- You will NOT be allowed any extra credit projects, etc. to compensate for a poor average. Everyone must be given the same opportunity in this class. Individual exams WILL NOT be curved.
- No exam may be taken early or made up, except if you provide a university excused absence with appropriate documentation.

**TENTATIVE LIST OF TOPICS:** Introduction, Describing data, Basic probability, Random variables, Normal distribution, Binomial distribution, Sampling distribution, Confidence interval, Hypothesis testing, Data collection, Chi- square tests, Comparing two means, Correlation & regression.

NOTE: The list and order of topics is tentative, I may alter the order and length of time spent on any particular topic.

### Your responsibilities:

- Completing all homework problems posted in Top Hat.
- Reading all my e-mails in a timely manner, i.e. check your e-mail at least every other day.
- Taking all exams. If you miss an exam it is your responsibility to contact me ASAP.
- Asking for help when you need it and not waiting until the end of the semester. Practice active learning instead of waiting until the day before an exam to attempt to learn the material.

**Classroom policy:** Please turn off electronic devices (cell phones, ipods, etc.) while in the classroom, except possibly for in-class work. Questions are encouraged, especially to help clarify points in the lecture.

**Attendance policy:** Class attendance is an individual students responsibility. Students are expected to attend classes and to complete all assignments.

**Absence and makeup exam policy:**

- If you missed an exam, see the university rule on Attendance website  
Rule 7: <http://student-rules.tamu.edu/rule07>
- If you must miss an exam because of a university excused absence or due to illness or circumstances beyond your control, notify me in writing or by email (before, if feasible, otherwise within two working days after you return). If your absence is approved, I will notify you on how you may make up the exam.
- If you miss an exam and your reason for missing the assignment or exam is not accepted, then you will receive a score of 0 for the assignment or exam.
- A temporary grade of I (Incomplete) at the end of a semester indicates that the student has **completed the course with the exception of a major quiz, final exam, or other work**. The instructor shall record an I for your grade only when the deficiency is due to an authorized absence or other cause beyond the control of the student.

**STATEMENT ON DISABILITIES:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

**COPYRIGHT NOTICE:** The handouts used in this course are copyrighted. By “handouts”, I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

**Academic Integrity Statement:** I aim to treat you fairly. I expect you to treat me and your fellow students fairly. I take academic honesty seriously, and expect you to do so as well. You should be aware of the Honor Council rules and procedures, the Honor Code, and the definitions of “academic misconduct” at [aggiehonor.tamu.edu/RulesAndProcedures/HonorSystemRules.aspx](http://aggiehonor.tamu.edu/RulesAndProcedures/HonorSystemRules.aspx)

**“An Aggie does not lie, cheat, or steal or tolerate those who do.”**

## Tentative weekly plan:

This is only a tentative schedule. I may alter the order and length of time spent on any particular topic to accommodate this particular class of students. This schedule is presented here to give you an idea of the flow of the course. Exam Days are Fixed.

- Week 1: - (1/15) Syllabus Day, Introduction, Sample vs. population, descriptive vs. inferential  
- (1/17) Variables: Qualitative & Quantitative, Graphs
- Week 2: - (1/22) Mean and Median; Measures of spread: standard deviation  
- (1/24) IQR, box plots, Scatterplots, Correlation
- Week 3: - (1/29) Data collection  
- (1/31) Basic Probability
- Week 4: - (2/5) Conditional probability (two by two table)  
- (2/7) Discrete probability distribution
- Week 5: - (2/12) Continuous probability distribution: Normal distribution; empirical rule  
- (2/14) Z scores; calculating probability using standard normal table
- Week 6: - (2/19) Review  
- (2/21) Exam one or Midterm one
- Week 7: - (2/26) Sampling distributions: means  
- (2/28) Sampling distributions: proportions
- Week 8: - (3/5) Confidence Intervals (CI): proportions  
- (3/7) Confidence Intervals (CI): means
- (3/11-3/15) Spring Break
- Week 9: - (3/19) Hypothesis Tests (HT): proportions  
- (3/21) Hypothesis Tests (HT): means, Equivalence of CI & HT in decision making
- Week 10: - (3/26) Finish HT  
- (3/28) 2-sample CI for means (independent samples)
- Week 11: - (4/2) 2-sample HT for means (independent samples)  
- (4/4) 2-sample CI and HT for proportions; (independent samples)
- Week 12: - (4/9) Review  
- (4/11) Exam two or Midterm two
- Week 13: - (4/16) Two by two contingency table; Chi-square test of independence  
- (4/18) Finish Chi-square test of independence; Regression

Week 14: - (4/23) Finish Regression; correlation and  $R^2$   
- (4/25) Finish correlation and  $R^2$

Week 15: - (4/30) Review for Final Exam  
- [May 2, Final Exam](#)