

Course Syllabus for CS/SE/STAT 3341

Fall 2016

Instructor information:

Dr. Tristan Whalen | Office: FN 2.206 | Email: tgw100020@utdallas.edu
Fall 2016 Office Hours: M/W 3:00-4:00pm, and by appointment, on school days

Course prerequisites:

MATH 1326 or MATH 2414 or MATH 2419, and
CE/CS/TE 2305, C or better

Grading:

10% Online Homework average
15% Take-Home Quiz average
25% Exam 1
25% Exam 2
25% Exam 3

A+: [97, 100], A: [93, 97), A-: [90, 93)
B+: [87, 90), B: [83, 87), B-: [80, 83)
C+: [77, 80), C: [73, 77), C-: [70, 73)
D+: [67, 70), D: [63, 67), D-: [60, 63)
F: [0, 60)

Required materials:

Textbook: *Probability and Statistics for Computer Scientists*, M. Baron, Chapman & Hall/CRC Press (2014), Second Edition
ISBN 9781439875902

Calculator: A calculator is permitted on all assignments, including homework, quizzes, and exams. Graphing or statistics calculators are acceptable. You will be required to show work on exams and demonstrate conceptual understanding.

Computer and internet access: for online homework, email announcements, and course materials in elearning.

Online Homework:

Assigned using WeBWork. There is no monetary cost to use WeBWork. You will be given login information and instructions in class and in elearning.

Your lowest homework grade will be dropped. There are no make-ups of online homework.

Take-Home Quizzes:

A take-home quiz will be posted in elearning about once per week. You will print the quiz at home, complete it (open book), then turn it in at my office or in class before the deadline.

Your lowest take-home quiz grade will be dropped. There are no make-ups of take-home quizzes.

Exams:

There are three exams that will be given in class on the following dates (Wednesday for 501 or Thursday for 001):

Exam 1: October 5/6 Exam 2: November 2/3 Exam 3: December 6/7

Do not miss an exam! Make-ups will be given only for extraordinary circumstances. Forgetting is not an extraordinary circumstance.

There is not a final exam for this course.

Topics Calendar:

Week	Section(s)	Topic(s)
1 Aug 22-25	1 2.1-2.2	Introduction. Sets, events, and outcomes. Axioms of probability.
2 Aug 29-Sep 1	2.2 2.4	Probability rules. Reliability. Conditional probability, independence, Bayes' Rule, Law of Total Probability.
Monday September 5: Labor Day. University closed.		
3 Sep 6-8	3.1-3.3	Random variables. Random vectors, joint and marginal distributions. Expected value, variance, and standard deviation.
4 Sep 12-15	3.4	The Bernoulli, Binomial, Geometric, and Poisson distributions.
5 Sep 19-22	4.1-4.2a	Continuous random variables. The Uniform, Exponential, and Gamma distributions.
6 Sep 26-29	4.2b-4.3	The Normal Distribution. The Central Limit Theorem.
7 Oct 3-6	EXAM	Monday/Tuesday: Catch up. Wednesday/Thursday: EXAM 1 (Probability Core)
8 Oct 10-13	6.1, 6.3	Introduction to stochastic processes. Binomial processes. Poisson processes.
9 Oct 17-20	6.2	Markov chains.
10 Oct 24-27	7.1, 7.3	Introduction to queuing processes. Bernoulli single-server queuing processes.
11 Oct 31-Nov 3	EXAM	Monday/Tuesday: Catch up. Wednesday/Thursday: EXAM 2 (Advanced Probability Topics)
12 Nov 7-10	8 9.1a	Introduction to statistics. Parameter estimation. Method of moments.
13 Nov 14-17	9.1b 9.2-9.3	Method of maximum likelihood. Confidence intervals.
14 Nov 21-25	BREAK	Thanksgiving Break. No classes Monday Nov 21 to Wednesday Nov 23. University closed Thursday Nov 24 to Saturday Nov 26.
15 Nov 28-Dec 1	9.4 11.1	Hypothesis testing. Introduction to regression. Linear regression.
16 Dec 5-7	EXAM	Monday/Tuesday: Catch up. Wednesday/Thursday: EXAM 3 (Classical Statistics Topics)
The End. There is no final exam.		

***The instructor may change the schedule if necessary.**

Assignment and grade policies:

- I have no plans to offer extra credit.
- I do not give free points or round grades, regardless of whether you are graduating or not, and regardless of whether you are a graduate student or not. I follow the grade standards given above to keep things as fair as possible for all students.
- I do strictly follow the one-drop, no make-up policies on quizzes and homework.
- I do strictly enforce the deadlines on take-home quizzes and online homework. If you are not coming to class, I recommend that you drop off take-home quizzes at my office the night before.
- I do not accept assignments by email. I understand that this would be convenient, but unfortunately for a large class it is not practical.
- It is your responsibility to drop the course if you decide to withdraw.

Classroom policies:

- Attendance is highly recommended. If you choose not to attend class, it is your responsibility to keep up with the material, submit assignments at my office on time, and maintain your grade.
- Attendance is, of course, required on exam days. I will ask you to leave your bags and things at the side or front of the classroom during exams.
- Please put away and silence all mobile devices (smartphones, laptops, etc.) during class. I may ask that you put away your device if I find it distracting in class.
- Avoid leaving class early or coming in late.
- Participation in class is desired and encouraged. Please avoid side conversations. Raise your hand to comment or ask a question.

Instructor email and office policies:

- I encourage you to email me, visit during my office hours, or email to request an office appointment for help with this course.
- Please, put your course number and section number in the subject of every email to me.
- Open door policy: if I am in my office and the door is open, you are welcome to come in and discuss the course with me.

Course content:

Axiomatic probability theory, independence, conditional probability. Discrete and continuous random variables, special distributions of importance to CS/SE and expectation, Central Limit Theorem. Introduction to stochastic processes. Illustrative examples and simulation exercises from queuing, reliability, and other CS/SE applications. Basic statistical inference, parameter estimation, hypothesis testing, and linear regression.

Learning objectives:

Students will learn fundamental rules of probability, discrete and continuous distributions, and statistical methods most commonly used in computer science and software engineering. They will be introduced to stochastic processes, Markov chains, and statistical inference, and they will apply the theory and methods to the evaluation of queuing systems and the computation of their vital characteristics.

The content of this syllabus may change at the discretion of the instructor.

UT Dallas syllabus policies and procedures:

The information contained in the following link constitutes the university's policies and procedures segment of the course syllabus.

<http://go.utdallas.edu/syllabus-policies>