

# Course Syllabus for CS/SE/STAT 3341

## Spring 2017

3341.001 | 8:30am – 9:45am | GR 3.420

3341.003 | 11:30am – 12:45pm | GR 3.420

### Instructor information:

Dr. Tristan Whalen | Office: FN 2.206 | Email: [tgw100020@utdallas.edu](mailto:tgw100020@utdallas.edu)

Spring 2017 Office Hours: Fridays 12:00 – 2:00pm, and by appointment

- 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 and signature of every email to me.

### Course prerequisites:

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

<b>Grading:</b> 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)
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### 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 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:

Exam 1: Wednesday, February 22      Exam 2: Wednesday, March 29      Exam 3: Wednesday, April 26

Do not miss an exam! Make-ups will be given only for extraordinary circumstances. There is not a final exam for this course.

## Topics Calendar:

Week	Section(s)	Topic(s)
1 Jan 9,11	1 2.1-2.2	Introduction. Sets, events, and outcomes. Axioms of probability. Probability rules.
No classes Monday, January 16		
2 Jan 18	2.2 2.4	Reliability. Conditional probability, independence.
3 Jan 23, 25	2.4 3.1-3.2	Bayes' Rule, Law of Total Probability. Random variables. Random vectors, joint and marginal distributions.
4 Jan 30, Feb 1	3.3 3.4	Expected value, variance, and standard deviation. The Bernoulli, Binomial, Geometric, and Poisson distributions.
5 Feb 6, 8	4.1-4.2a	Continuous random variables. The Uniform, Exponential, and Gamma distributions.
6 Feb 13, 15	4.2b-4.3	The Normal Distribution. The Central Limit Theorem.
7 Feb 20, 22	EXAM	Monday: Catch up. Wednesday: <b>EXAM 1</b>
8 Feb 27, Mar 1	6.1, 6.3	Introduction to stochastic processes. Binomial processes. Poisson processes.
9 Mar 6, 8	6.2	Markov chains.
No classes Monday, March 13 to Sunday March 19		
10 Mar 20, 22	7.1, 7.3	Introduction to queuing processes. Bernoulli single-server queuing processes.
11 Mar 27, 29	EXAM	Monday: Catch up. Wednesday: <b>EXAM 2</b>
12 Apr 3, 5	8 9.1a	Introduction to statistics. Parameter estimation. Method of moments.
13 Apr 10, 12	9.1b 9.2-9.3	Method of maximum likelihood. Confidence intervals.
14 Apr 17, 19	9.4 11.1	Hypothesis testing. Introduction to regression. Linear regression.
15 Apr 24, 26	EXAM	Monday: Catch up. Wednesday: <b>EXAM 3</b>

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

### Classroom policies:

- Attendance is highly recommended.
- Avoid leaving class early (this is very distracting) except for emergencies.
- Please put away and silence all mobile devices (smartphones, laptops, etc.) during class unless you are part of an emergency response team.
- Participation in class is desired and encouraged. Please avoid side conversations. Raise your hand to comment or ask a question.
- On exam days, plan to leave your bags and things at the side or front of the classroom.

### Assignment and grade policies:

- There is no extra credit. Grades are computed using the same standard for everyone as given in this syllabus; in particular there is no rounding or free points.
- One quiz and one homework is dropped for everyone, and there are no make-ups.
- Instructions must be followed for submitting assignments to receive credit.
- It is your responsibility to drop the course if you decide to withdraw. The deadlines are:  
Wed. Jan. 25 for no record    Mon. Feb. 20 for "W"    Mon. Mar. 27 for "WL"

**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>