

Stat 330 Section 2 : Probability and Statistics for Computer Science

Lecture location: Hamilton Hall 0169

Lecture times: MWF 3:10–4:00pm

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Office hours: Tues. 3:45-5:15pm

Prerequisites: Math 166: Calculus II.

Course description: Topics from probability and statistics applicable to computer science. Basic probability; Random variables and their distributions; Stochastic processes including Markov chains; Queuing models; Basic statistical inference; Introduction to regression.

Learning outcomes:

1. Students will acquire knowledge of topics in probability including rules of probability, counting methods, Bayes' rule, random variables, expectation and variance, and common discrete and continuous distributions. Students will be able to apply these knowledge to some engineering applications such as computing system reliability.
2. Students will be acquainted with stochastic processes including Markov processes and be able to conduct basic analysis, e.g. computing average waiting time, of queuing systems such as M/M/1 and M/M/k queue.
3. Students will know fundamental methods for statistical inference such as descriptive statistics, confidence intervals and hypothesis tests.
4. Students will learn about simple linear regression and be able to compute the least square estimates.

Optional Text and references: The optional textbook for this class is *Probability and Statistics for Computer Scientists, Second Edition (2013)*, by Michael Baron. We will cover most of chapters 1-4 and 6-11.

I will provide notes on Canvas that will be the material you are responsible for and will serve as the basis of our lectures.

Course webpage: Canvas (<https://canvas.iastate.edu>) has course information, lecture material, assignments, solutions, exam preparation materials, and access to grades.

Assessment: Your final course grade is computed based on the following proportions: 25% homework, 50% in-semester exams and 25% final exam.

- **Homework:** Homework assignments will be assigned throughout the semester. Assignments are due in the lecture on the due date. Late homework submissions are given half-credit and are only accepted until the lecture following the due date.

For each homework there will typically be 6 problems. Only three of the problems will be graded. Two of these three graded problems will be indicated in advance, and the grader will choose another. The lowest homework score will be dropped.

Homework is to be completed and submitted individually. Group work is encouraged but all answers must be unique to the student.

- **In-semester exams:** There will be three in-semester exams. Only the best two will be counted towards the final course grade (i.e. each of the two are worth 25% of your final course grade). The tentative dates for these exams are **February 12** (Wednesday), **March 11** (Wednesday), and **April 8** (Wednesday), but these dates are subject to change. Each exam is 50 minutes, completed in lecture. If the date of an exam changes, I will give at least one week's notice and make sure the change is announced in lecture and posted on Canvas. Since one in-semester exam will be dropped, I do not give make-up exams.
- **Final exam:** The University has tentatively set the final exam on **May 7** (Thursday) from **2:15–4:15pm**. Note the date and time are subject to change. The final exam is cumulative and may not be taken early under any circumstances.

Dead Week: This class follows the Iowa State University Dead Week policy as noted in section 10.6.4 of the Faculty Handbook:

<http://www.provost.iastate.edu/resources/faculty-handbook>

There will be one homework assignment due during Dead Week.

Academic dishonesty: Academic Dishonesty The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office:

<http://www.dso.iastate.edu/ja/academic/misconduct.html>

Accessibility Statement: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at <http://www.sas.dso.iastate.edu>, by contacting SAS staff by email at accessibility@iastate.edu, or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

Harassment and Discrimination: Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns about such behavior should contact his/her instructor,

Student Assistance at 515-294-1020 or email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance at 515-294-7612.

Religious Accommodation: If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the Dean of Students Office or the Office of Equal Opportunity and Compliance.