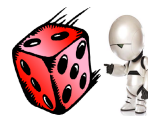


Welcome to CSE 312!

### CSE 312: Foundations of Computer Science, II

- **Instructor**  
Anna R. Karlin ([karlin@cs.washington.edu](mailto:karlin@cs.washington.edu))

**Tas**  
Justin Kotalik  
Jonathan Lee  
Saidutt Nimmagadda  
Varun Mahadevan  
Alex Tsun



### Course website

<http://courses.cs.washington.edu/312/>

We will also be using canvas for some things (e.g. homework turnin)

### CSE 312: Foundations of Computer Science, II

- **Probability and statistics**

- **Books (all online or optional)**

**Introduction to Probability** (2<sup>nd</sup> ed.)

Bertekas and Tsitsiklis

**Mathematics for Computer Science**

Lehman, Leighton and Meyer

**Discrete Mathematics and its Applications**

Rosen [optional]

**OpenIntro Statistics**

Dietz, Barr and Cetinkaya-Rundel

**Introduction to Probability Models**

Sheldon Ross

- **Workload**

Weekly Homework

(Out Wednesday by midnight, due next Wednesday by 11:59pm)  
midterm



### syllabus

- **Probability**

Counting  
Basic probability  
Conditional probability  
Random variables  
Discrete and continuous distributions  
Expectation and variance  
Tail bounds and the central limit theorem

- **Statistics**

Maximum-likelihood estimation  
Bayesian estimation  
Hypothesis testing

- **Applications...**

## Applications

- Machine learning/AI
- Simulation
- Cryptography
- Systems and Queueing Theory
- Big Data
- Data compression
- Communications and error-correcting codes
- Quantum computing

### syllabus

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**Counting** -----  
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Hypothesis testing  
Machine learning