Lecture 00: Introduction

What to Expect from this Course?

- We shall learn the fundamentals of cryptography
  - Topics: Private-key Cryptography, Pseudorandomness, MACs, (possibly) Hashing, Public-key Cryptography, Digital Signatures, (possibly) Basics of Multi-party Computation
- Coding is encouraged to develop intuition
  - You can use sage (similar to Python) for coding. You can use the free platform cocalc to write and compile sage code
- Lectures are highly interactive
  1. Old video lectures are online on Brightspace
  2. Old in-person lectures are online on Brightspace

Who am I?

- Name: Hemanta K. Maji
- Research Interests: Cryptography, Information Theory, Theoretical Computer Science
- Office: LWSN 1177
- Office Hours: By email

- We shall use Ed Stem for this course to ask and answer questions (joining code is available on Brightspace). Everyone is highly encouraged to use this platform

- Evaluation: (Roughly) Seven/eight homework (40%), one mid-term exam (25%), and a final exam (35%).
- Grading will be done using percentiles.
  - In Fall 2017, Fall 2018, Spring 2020, Fall 2020, Spring 2021, Fall 2022, and Spring 2024, the following grades were given: A+, A, A-, B+, B, B-, C, C-, and F.
  - Roughly 25% of students for A or higher, and
  - Roughly 20% of students got C or below
  - Solving extra-credit problems earns you the instructors' goodwill. So, if your total score is close to a grade threshold, then you might get a higher grade if you have sufficient "instructors' goodwill"
  - In each course offering, a couple of students get an F

- Homework Submission: All homework must be LaTeX-ed
  - We shall provide the LaTeX-files for the questions
  - You can use Overleaf to typeset your solutions
  - How to submit pdfs for evaluation? TAs will get back to you soon
  - We shall use Brightspace
  - Students are highly encouraged to collaborate for homework. However, Every student must typeset their own solutions. Furthermore, please mention the names of all the students whom you collaborated on each question

- Please go over the course policy website for all additional details

Instruction in the Course

- Lecture Notes prepared by me will be uploaded
- Reference Book: Introduction to Modern Cryptography, Second Edition by Jonathan Katz and Yehuda Lindell
- Another good book for reference: A Graduate Course in Applied Cryptography by Dan Boneh and Victor Shoup
- The lectures and the lecture notes will encourage students to work and think on exploratory problems
- A recommended book for building mathematics background: An Introduction to Mathematical Cryptography (Undergraduate Texts in Mathematics) by Jeffrey Hoffstein, Jill Pipher, and Joseph H. Silverman

Introduction to your TAs

- Hamidreza Amini Khorasgani
- Albert Yu
- Office Hours will be finalized after a poll on Ed Stem

Background Needed

- Basic Mathematics, like integration, differentiation,
- Asymptotic Notation, and
- Probability Basics.