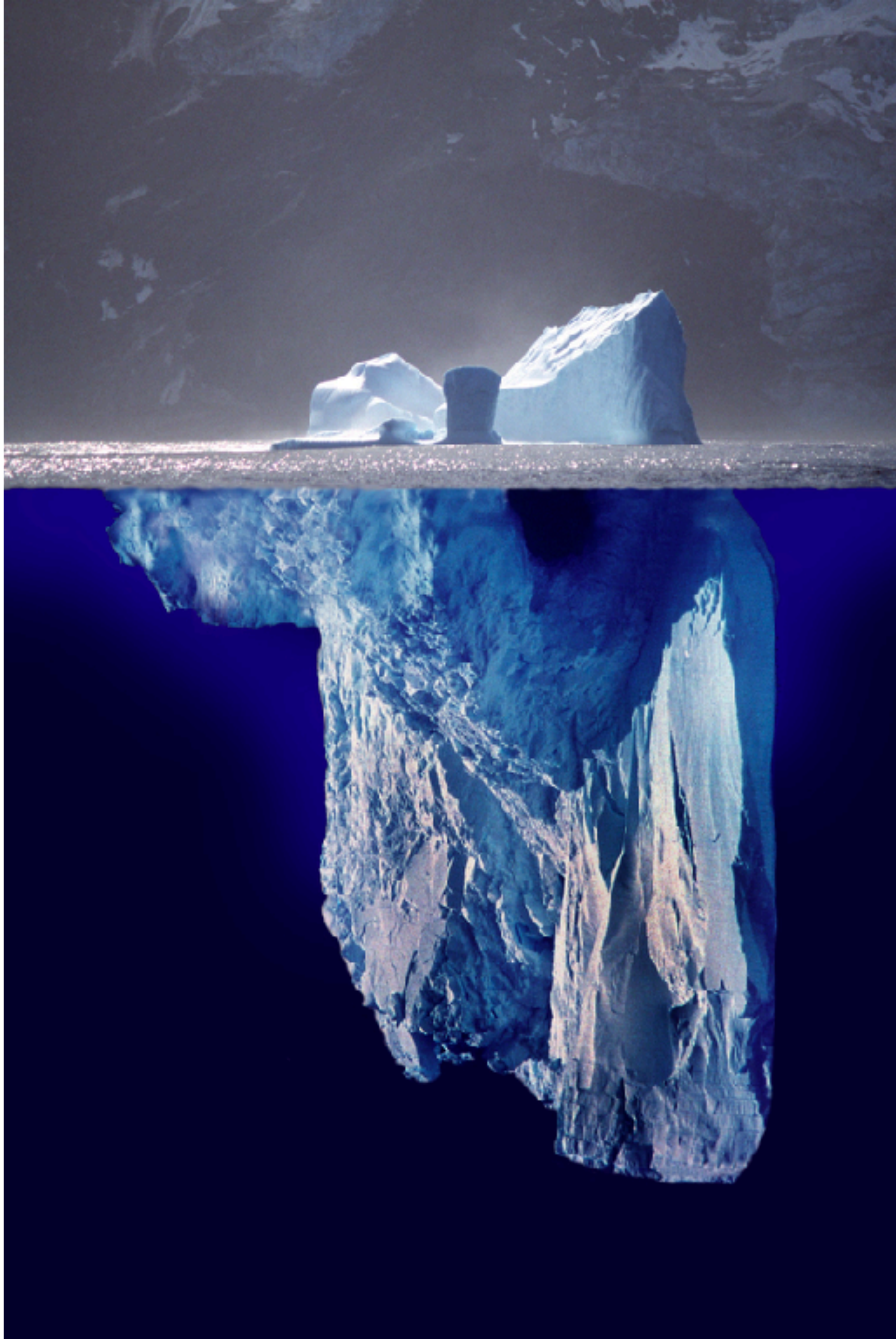
CS 465
Computer Security

Instructor: Daniel Zappala

Tip of the Iceberg

This class will introduce you to the important field of computer security.

- Principles and patterns
- Way of thinking
- Lifelong learning
- Relevant to you both personally and professionally — whether you are a software developer, data analyst, technology user, security expert



Learning Objectives

- Gain a breadth of knowledge in computer security
    - Understand basic security terminology and use it accurately in technical discussions
    - Understand the kinds of threats facing people and systems and the technology to address those threats
    - Understand the limitations of technology in creating a secure system

Learning Objectives

- Understand the basic principles of cryptography and how cryptographic building blocks can be assembled to provide security services
  - Remove the mystery of cryptography and replace it with knowledge of basic principles
  - Understand the use of cryptography in existing security protocols
  - Be able to explain how a protocol meets a given set of security requirements

Learning Objectives

- Understand the basic principles of secure software design
    - Avoid common design and development errors
    - Understand basic usage of standard cryptographic primitives

Learning Objectives

- Develop leadership skills
  - Be able to make sound technical decisions in the design and acquisition of security technology
  - Develop technical and communication skills needed for leadership roles
  - Be ready to conduct security research in industry or graduate school

Learning Objectives

- Promote a code of ethics that is compliant with the law and in accordance with gospel principles

Topics of Study

- Cryptography
  - symmetric key cryptography
  - public key cryptography
  - cryptographic hash functions
  - MAC

Topics of Study

- Systems
  - SSL/TLS (HTTPS)
  - Secure email
  - Passwords

Topics of Study

- Software Security
  - Buffer overflow
  - Password cracking
  - SQL injection
  - Cross-site scripting
  - Social Engineering

Logistics

- Class web site: cs465.internet.byu.edu
- Learning Suite: submit assignments, get grades
- Class discussions: Piazza (link on class web site)

Logistics

- Reading — each day reading assigned, please follow along, lectures will assume familiarity with the material
- Homework — due before class most Tuesdays
- Projects — due at midnight, see class schedule
- Exams — 2 midterms + final
- Late Policy — see class website

Logistics

- Study in groups is encouraged — discuss problems, how to solve them, but do your own work
    - Write you own solution
    - Don’t view anyone else’s code
- Workload — about 6 hours per week
    - First lab is time consuming — start now
    - Workload diminishes during the semester

Code of Ethics

- You commit to
  - Ethically study computer security for educational purposes
  - Refrain from using the knowledge gained to knowingly probe and attack computer security systems, unless having first received written permission from the owners or operators of those systems
  - Carefully consider ethical issues as knowledge of computer security increases
  - Strive to formulate a personal code of ethics of the highest integrity

Code of Ethics

- Unethical practices include
  - cracking passwords to gain unauthorized access
  - deliberately spreading viruses or Trojan horses
  - conducting a denial of service attack
  - attempting buffer overflow attacks
  - impersonating another person on a computer system you do not own

Code of Ethics

- Failure to comply could result in
    - Suspension of computer privileges in the CS Department
    - Expulsion from BYU
    - Possible criminal prosecution