Week 1: Introduction

Data Science BS Program,
New York City College of Technology
Spring 2026

Agenda

- Course overview & objectives
- Importance of security & ethics
- Historical perspective
- Fundamentals: CIA Triad
- Threat landscape
- Authentication & access control
- Privacy & legal frameworks
- Course requirements & evaluation
- Expectations & academic integrity
- Q&A & next steps

Course Overview & Objectives

Goal: Build security-conscious data scientists

- Understand core security principles and ethical issues
- Learn practical skills in authentication, access control, cryptography and risk assessment
- Explore privacy laws, policies and the implications of data misuse
- Prepare for real-world challenges in data-driven organisations

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Why Data Security & Ethics Matter

- Data breaches and cybercrime are rising
- Public trust depends on privacy protections
- Ethical missteps can harm users and reputations
- Security is a competitive differentiator

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A Brief History of Computer Security

- Early computing and isolated mainframes
- The ARPANET and the first worms
- The evolution of viruses, trojans and ransomware
- Growing complexity and connectedness of networks

Fundamentals: The CIA Triad

Confidentiality *Only authorized users and processes can access data*

Integrity *Data and systems are protected from unauthorized modification*

Availability *Systems and data are accessible to authorized users when needed*

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Understanding Threats & Vulnerabilities

- Malware: viruses, worms, trojans, ransomware
- Social engineering & phishing
- Insider threats & human error
- Web, network and cloud vulnerabilities

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Authentication & Access Control

- Authentication verifies identity
- Authorization defines what you can do
- Access control models: DAC, MAC, RBAC
- Multi-factor authentication & password hygiene

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Privacy & Legal Frameworks

- Privacy principles: notice, consent, purpose limitation
- Key regulations: HIPAA, GDPR, state laws
- Corporate policies and terms of service
- Balancing analytics with user rights

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Course Syllabus & Evaluation

- Textbook: Computer Security: Principles & Practice
- Grading: assignments, labs, project & exams
- Participation & attendance expectations
- Policies: late work, academic integrity

Expectations & Academic Integrity

- Collaborative learning vs. academic misconduct
- Respectful discussion & inclusive participation
- Proper citation of sources
- Professional communication and conduct

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Summary & Next Steps

- Reviewed course structure and importance of security
- Introduced foundational concepts and threat awareness
- Outlined assignments, policies and expectations
- Next week: Cryptography basics and access control models