



College of Science & Mathematics Student Success Center Tech Science Decision Guide

Computer Science ? Information Technology ? Computer Engineering? Use this guide to assess which tech-science major best aligns with your interests, skills, and career aspirations.

Computer Science

Computer Science is the scientific and practical approach to computation and its applications. It covers theoretical disciplines such as algorithm design, computability theory, information theory and applied disciplines such the design and implementation of hardware and software.

Computer scientists are adept at:

- Algorithm design and optimization.
- Artificial intelligence and machine learning.
- Computational modeling.
- Cybersecurity.
- Data analysis and interpretation.
- Hardware and software development.
- Human-computer interaction.

A representative problem tackled by beginner CS students might involve The RSA (Rivest-Shamir-Adleman) cryptosystem. This cryptosystem is widely used for secure communication in browsers, bank ATM machines, credit card machines, mobile phones, smart cards, and operating systems. Implementing a library that supports core functions needed for developing the RSA cryptosystem and implementing programs for encrypting and decrypting messages using RSA.

Computer Engineering

Computer Engineering merges the realms of hardware and software, entailing the design and development of computer systems and components. Unlike Computer Science, which primarily focuses on the theoretical and practical aspects of computations and algorithm development, Computer Engineering delves into the physical construction and integration of computing devices.

Computer Engineering enthusiasts are adept at:

- Integrating hardware and software components.
- Understanding both digital and analog systems.
- Designing and optimizing computer architecture.
- Developing embedded systems for various applications.
- Balancing system performance and power efficiency.

In essence, while Computer Science majors concentrate on problem-solving through algorithms and software development, Computer Engineering involves a broader spectrum, encompassing the interplay between hardware and software to create functional computing systems.

A representative problem tackled by beginning Computer Engineering students might involve designing a simple digital circuit and programming it to perform a specific task, thereby demonstrating their understanding of both hardware and software interaction.

Information Technology

In broad terms, CS students create while IT students maintain. An IT major is someone who likes computers but does not have a strong interest in programming.

IT enthusiasts are adept at:

- Configure and maintain all user machines.
- Configure and maintain all servers.
- Configure and maintain the networks.
- Assist users with all software and hardware issues.
- Configure and maintain security procedures for all IT infrastructure.
- Identify improvements to IT infrastructure.
- Assist Managers in making decisions using internal data.
- Assist Law Enforcement in detecting illegal activity and presentation of evidence.

A representative problem tackled by beginner Information Technology (IT) students might involve writing a simple script to automate computerized tasks. This demonstrates their ability to use a programming language, understand how it interacts with an operating system, and introduces automation to increase business efficiency.