

# Computer Science III: Databases

Databases introduces students to the basic concepts of databases including types of databases, general database environments, and the importance of data to the business world. Discussion with hands-on activities will include database design, normalization of tables, and development of tables, queries, reports, and applications.

Students will be familiarized with the use of ANSI standards Structured Query Language. Discussions will include database administration and data maintenance. Students will be introduced to data concepts such as data warehousing, data mining, and BIG data.

Students will develop a business application using database software such as Microsoft Access. Students will be required to demonstrate skills such as team building, work ethic, communications, documentation, and adaptability.

- Recommended Grade Level: 11, 12
- Required Prerequisite: Computer Science I and Computer Science II
- Credits: 2 semester course, 2 semesters required, 1-3 credits per semester, 6 credits maximum
- Curriculum: CodeHS.org.
- Language: SQL
- Requirement: Chromebook or laptop, windows 10, Internet connection.

## Content

Unit 1: Hour of SQL

Unit 2: SQL Part II

Unit 3: SQL Functions

Unit 4: Data Aggregation

# Computer Science III: Cybersecurity

Cybersecurity introduces the secure software development process including designing secure applications, writing secure code designed to withstand various types of attacks, and security testing and auditing. It focuses on the security issues a developer faces, common security vulnerabilities and flaws, and security threats.

The course explains security principles, strategies, coding techniques, and tools that can help make software fault tolerant and resistant to attacks. Students will write and analyze code that demonstrates specific security development techniques. Students will also learn about cryptography as an indispensable resource for implementing security in real-world applications.

Students will learn foundations of cryptography using simple mathematical probability. Information theory, computational complexity, number theory, and algebraic approaches will be covered.

- Grade Level: 11, 12
- Required Prerequisite: Computer Science I and Computer Science II
- Credits: 2 semester course, 2 semesters required, 1-3 credits per semester, 6 credits maximum
- Curriculum: CodeHS.org
- Language: HTML, JavaScript, SQL
- Requirement: Chromebook or laptop, windows 10, Internet connection.

## Content

Module 1: What is Cybersecurity? (1-2 weeks/5-10 hours)

Module 2: Digital Citizenship and Cyber Hygiene (1-2 weeks/5-10 hours)

Module 3: Project: PSA (1 week/5 hours)

Module 4: Programming Fundamentals (JavaScript) (2-3 weeks/10-15 hours)

Module 5: The ABCs of Cryptography (1-2 weeks/5-10 hours)

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Module 7: System Administration (3-4 weeks/15-20 hours)

Module 8: Software Security (3-4 weeks/15-20 hours)

Module 9: Project: Security Assessment Report (1 week/5 hours)

Module 10: Networking Fundamentals (3-4 weeks/15-20 hours)

Module 11: IT Infrastructure (2-3 weeks/10-15 hours)

Module 12: Project: Troubleshooting Project (1 week/5 hours)