CodeHS
TExES CS (241) Exam Prep Course Syllabus

Introduction

The TExES Computer Science 241 Exam is a comprehensive exam designed to demonstrate that a teacher is highly qualified in teaching computer science. This course prepares teachers to take this exam.

The CodeHS TExES 241 Computer Science prep course is offered entirely online and is made up of a series of learning modules that cover the basics of programming, computer science concepts, algorithms and computational thinking, working with data, demonstrating knowledge of computing systems and networks, and the pedagogy of teaching programming in a blended classroom. Each module is made up of short video tutorials, programming exercises, open-ended responses, debugging problems, and grading practice.

Programming Environment

Teachers write and run programs in the browser using the CodeHS editor.

More Information

Browse the content of this course at codehs.com/course/26880/overview

Course Breakdown (55-65 hours)

Unit 1: Welcome to the CodeHS TExES 241 Prep Course (0.5 hours)	
Topics Covered	- Welcome to the TExES 241 Prep Course - The TExES 241 Exam - Using CodeHS

Unit 2: Introduction to Programming in Java with Karel the Dog (14 hours)	
Topics Covered	- Introduction to Programming - More Basic Karel - Java Programs and the Run Method - Karel Can't Turn Right

	- Methods in Karel - Top Down Design and Decomposition - Commenting Your Code - Super Karel - For Loops - While Loops - If Statements - If/Else Statements - Control Structures Example - More Karel Examples and Testing - How to Indent Your Code

Unit 3: What is Computing? (1 hour)	
Topics Covered	- History of Computers - Computer Organization - Software - Hardware - Future of Computing - Ethical and Social Implications of Computing

Unit 4: Digital Information (2 hours)	
Topics Covered	- What is Code? - Intro to Digital Information - Number Systems - Encoding Text with Binary - Pixel Images - Hexadecimal and Octal Numbers - Pixel Colors - Cryptography

Unit 5: Data (2 hours)	
Topics Covered	- Getting Started with Data - Visualizing and Interpreting Data - Using Spreadsheets with Data - Data Collections and Limitations - Simulation

Unit 6: Internet (2 hours)	
Topics Covered	● Welcome to the Internet ● Internet Hardware ● Internet Addresses ● DNS and Routing ● Packets and Protocols ● Information Literacy ● Cybersecurity ● Malware Types and Prevention ● The Impact of the Internet ● Creative Credit & Copyright

Unit 7: Software (0.5 hours)	
Topics Covered	● Operating Systems Software ● Software and Applications

Unit 8: Project: Troubleshooting (1 hour)	
Topics Covered	● Methodology ● Support Practice

Unit 9: IT Infrastructure (2 hours)	
Topics Covered	● Internal Components ● Peripheral Devices ● Network Devices ● Storage Options ● Network Options ● Network Communication

Unit 10: Project: Digital Forensics (2 hours)	
Topics Covered	● Digital Forensics ● Logs ● File Metadata ● Exit Data

Unit 11: Creative Development (1 hour)	
Topics Covered	- Intro to Software Development - Intro to Design Thinking - Prototype - Test

Unit 12: Collaboration in Computer Science (2 hours)	
Topics Covered	- Collaboration in Computer Science - Whiteboarding - Pair Programming - Pop Coding - Storytelling through Code - Assessing Student Mastery - Assessing with Rubrics

Unit 13: Discrete Math for CS (1 hour)	
Topics Covered	- Sets, Functions, and Relations - Truth Tables & Propositional Logic - Formal Logic Proofs - Permutations & Combinations

Unit 14: Debugging in Java (1 hour)	
Topics Covered	- Basic Debugging in Java - Debugging Tools - Debugging Techniques - Common Java Errors - Common Compiler Errors - Java Outside of CodeHS

Unit 15: Basic Java (8 hours)	
Topics Covered	- Programming Languages - Organizational Techniques - Printing in Java - Variables and Types - User Input - Arithmetic Expressions - Casting

	● Booleans ● Logical Operators ● Comparison Operators ● For Loops ● While loops ● If Statements ● Nested Iterations ● Loop-and-a-Half ● Short Circuit Evaluation ● De Morgan's Laws ● Strings

Unit 16: Methods (3 hours)	
Topics Covered	● Java Methods ● Methods and Parameters ● Methods and Return Values ● String Methods ● Exceptions

Unit 17: Classes & Object-Oriented Programming (8 hours)	
Topics Covered	● Intro to Classes and Objects ● Classes vs. Objects ● Using a Class as a Client ● Writing Classes ● Writing Classes and Instance Methods ● Getter and Setter Methods ● Class Methods and Class Variables ● Method Overloading ● Local Variables and Scope ● Key Terms for Classes ● Objects vs. Primitives ● Inheritance ● Polymorphism

Unit 18: Data Structures (5 hours)	
Topics Covered	● What are Data Structures ● Introduction to Arrays ● Algorithm Performance ● Using Arrays ● 2D Arrays

	● Traversing 2D Arrays ● HashMaps, Stacks, and Queues

Unit 19: Algorithms and Recursion (4 hours)	
Topics Covered	● What is an Algorithm? ● Linear and Binary Search ● Selection, Insertion, and Merge Sorts ● Recursion ● Quick Sort ● Informal Code Analysis ● Random and Pseudorandom Numbers

Unit 20: Robotics (2 hours)	
Topics Covered	● Robotics as a Bridge Between CS and Engineering ● The Robotics Design Cycle ● Algorithmic Thinking for Robots ● Sensor Integration and Intelligent Behavior ● Robotics Simulation and Testing ● Robots in Society and the Classroom

Unit 21: Exploring Game Design (2 hours)	
Topics Covered	● Intro to Games ● Unpacking a Game ● Categorizing Games ● Game Design Document ● Intro to JavaScript ● Variables ● Introducing LIbraries ● Program Structure ● Understanding the Canvas ● Your First Sprites ● The Physics of Sprites

Unit 22: Project: React Native Mobile App (1 hour)	
Topics Covered	● Project Management ● React Mobile App Project

Unit 23: Final Tasks
Topics Covered	● Competency/Standard-Based Quizzes (50 questions each) ● Mock Exam (100 questions) ● Flashcards - Quizlets