Teaching Tomorrow's Technology.
CompuScholar

Computer Science Foundations

For Indiana's Course# 4565 -

Computing Foundations for a Digital Age

Course Syllabus and Planner

Course Overview

CompuScholar's **Computer Science Foundations** curriculum teaches introductory computer science concepts using the Python language. Other introductory programming courses are not required. Students merely need to have typical computer usage skills prior to starting this course.

Students can meet all requirements for Indiana's **4565 - Computing Foundations for a Digital Age** in one semester by completing a subset of the full **Computer Science Foundations** course.

Your **Computer Science Foundations** edition has been tailored to 4565 by removing nonessential chapters and lessons, leaving only the required subset for 4565. Teachers and students should simply complete all remaining chapters and lessons in sequence. See "Course Navigation for Indiana's 4565" below for more information.

Detailed alignments to 4565 requirements can be found on our Indiana curriculum page:

https://www.compuscholar.com/schools/standards/states/indiana

Course Material

The course material is designed to appeal to a variety of students, from traditional learners who thrive on written text to audio-visual students who enjoy a multimedia format. All content is delivered through an online system that allows students to work seamlessly both in the classroom and at home.

The course consists of the following student-facing elements:

- **Instructional Videos** – optional (not required), but enjoyed by many students as an audio-visual introduction and reinforcement of the lesson topics.
- **Lesson Text** – required reading, contains full topic details and live coding exercises
- **Quizzes and Exams** – multiple-choice and automatically graded by our system
- **Homework Exercises** - coding and other challenges recommended (but not required) for additional practice
- **Chapter Activities** – hands-on projects, submitted for a grade

Teachers additionally have access to:

- **Teacher's Guides** – for each lesson, with suggested classroom discussion questions
- **Quiz and Exam Answer Keys** – PDFs for quick reference
- **Activity Solution Guides** – fully coded activity solutions for each chapter activity

Programming Environment and Device Requirements

CompuScholar provides an in-browser Python coding environment. This online feature may be used by students to complete the Python coding exercises and activities. When using the online coding environment:

- **No local software installation is needed.**
- **The Python activities can be completed from any web browser on any device (including Chromebooks and tablets).**

Later, optional chapters contain a mixture of activities. Teachers may select any of these topics for students as desired to meet specific state requirements. Some optional activities can be done in CompuScholar's online environment, while others are completed offline on a local computer.

Project Grading

Each chapter normally contains one or more hands-on, graded activities. The Python coding activities **are fully auto-graded by the CompuScholar system**. Teachers have complete control over the auto-graded results.

Some activities in other chapters, especially those not involving a programming project, result in creative student work or work that is completed offline. The teacher is responsible for grading those creative or external projects.

Course Navigation for Indiana's 4565

CompuScholar's full **Computer Science Foundations** course is a two-semester experience that can meet a wide variety of requirements for introductory programming in many states. It also supports AP Computer Science Principles (AP CSP) classrooms.

Your edition has been **reduced to a single semester**, containing only essential materials needed to meet all requirements for **4565 - Computing Foundations for a Digital Age**. The following chapters and lessons remain to meet 4565 standards.

- **Chapter 1 - Computing Concepts**
- **Chapter 2 - Networking**
- **Chapter 3 - Fundamentals of Python**
- **Chapter 4 - Working with Data**
- **Chapter 5 - Input and OUtput**
- **Chapter 6 - Making Decisions**
- **Chapter 7 - Finding and Fixing Problems**
- **Chapter 8 - Loops**
- **Chapter 9 - Lists**
- **Chapter 11 - Working with Strings**
- **Chapter 12 - Creating Functions (Lessons 1, 2, and the Activity only)**
- **Chapter 15 - Designing Algorithms**
- **Chapter 17 - Understanding Data**
- **Chapter 18 - Impact of Computing**
- **Chapter 19 - Legal and Ethical Concerns**
- **Chapter 20 - Cybersecurity (Lessons 2 and 3 only)**
- **Chapter 26 - Operating Systems (Lessons 2 and 3 only)**
- **Supplemental Chapter 3: Additional Topics**

Teacher materials may contain notes about meeting standards for AP CSP, and those notes can be ignored in 4565 classrooms.

Course Planner

The following pages contain a suggested timeline for completing the minimal course content needed to meet **100% of Indiana's 4565 - Computing Foundations for a Digital Age** requirements in a **single semester.**

A normal school semester consists of 18 calendar weeks or 90 days of school. Each "day" listed below represents one typical class period of 45 – 60 minutes. In most cases, students will complete 1 lesson per day (including the quiz and hands-on "Work with Me" exercises), 1 day per Chapter Activity, and 1 day per Chapter Test. Chapter Homework may be completed in or out of the classroom as desired. Some classes may move faster or slower than the suggested pace.

Chapter Exams are 20-question, multiple choice tests that may not take an entire class period. To save time, teachers might start new lessons directly after a completed exam. Some lessons or activities might also not take a full class period and can be combined.

One-Semester Timeline

Days	CompuScholar Chapter and Lab	Notes
	Chapter 1: Computing Concepts	
Day 1	Lesson 1 - Evolution of Computers	
Day 2	Lesson 2 - Computer Hardware	
Day 3	Lesson 3 - Computer Software	
Day 4	**Activity: Using Peripherals**	Activity: teacher-graded
Day 5	**Chapter Exam**	
	Chapter 2: Networking	
Day 6	Lesson 1 - Network Hardware	
Day 7	Lesson 2 - How the Internet Works	
Day 8	Lesson 3 - Internet Scalability & Fault Tolerance	
Day 9	Lesson 4 - Parallel and Distributed Computing	
Day 10	**Activity: Network Analysis**	Activity: auto-graded
Day 11	**Chapter Exam**	

Days	CompuScholar Chapter and Lab	Notes
	Chapter 3: Fundamentals of Python	
Day 12	Lesson 1 - Introduction to Python	
Day 13	Lesson 2 - Running Python Programs	
Day 14	Lesson 3 - Writing Python Code	
Day 15	**Activity: Class Schedule**	Activity: auto-graded
Day 16	**Chapter Exam**	
	Chapter 4: Working with Data	
Day 17	Lesson 1 - Introduction to Abstraction	
Day 18	Lesson 2 - Data Types and Variables	
Day 19	Lesson 3 - Using Numeric Variables	
Day 20	Lesson 4 - Using String Variables	
Day 21	**Activity: Cash Register**	Activity: auto-graded
Day 22	**Chapter Exam**	
	Chapter 5: Input and Output	
Day 23	Lesson 1 - Printing with Parameters	
Day 24	Lesson 2 - Getting Input from a User	
Day 25	Lesson 3 - String Formatting	
Day 26	**Activity: Character Art**	Activity: auto-graded
Day 27	**Chapter Exam**	
	Chapter 6: Making Decisions	
Day 28	Lesson 1 - Logical Expressions	
Day 29	Lesson 2 - The "if" Statement	
Day 30	Lesson 3 - Logical Operators	
Day 31	Lesson 4 - More Complex Expressions	
Day 32	**Activity: Blue Moon**	Activity: auto-graded
Day 33	**Chapter Exam**	
	Chapter 7: Finding and Fixing Problems	
Day 34	Lesson 1 - Types of Errors	
Day 35	Lesson 2 - Troubleshooting Tools	
Day 36	Lesson 3 - Using the Python Debugger	
Day 37	**Activity: Chat-Bot**	Activity: auto-graded
Day 38	**Chapter Exam**	

Days	CompuScholar Chapter and Lab	Notes
	Chapter 8: Loops	
Day 39	Lesson 1 - "For" Loops	
Day 40	Lesson 2 - "While" Loops	
Day 41	Lesson 3 - Break, Continue, and Else	
Day 42	**Activity: Vowel Eraser**	Activity: auto-graded
Day 43	**Chapter Exam**	
	Chapter 9: Lists	
Day 44	Lesson 1 - Lists and Tuples	
Day 45	Lesson 2 - List Functions	
Day 46	Lesson 3 - List Traversal	
Day 47	Lesson 4 - Sequential and Binary Searches	
Day 48	**Activity: Burger Castle**	Activity: auto-graded
Day 49	**Chapter Exam**	
	Chapter 11: Working with Strings	
Day 50	Lesson 1 - Character Data	
Day 51	Lesson 2 - String Functions	
Day 52	Lesson 3 - Input Validation (try/except)	
Day 53	**Activity: Pig Latin Translator**	Activity: auto-graded
Day 54	**Chapter Exam**	
	Chapter 12: Creating Functions	**Complete Lessons 1, 2 and the Chapter Activity only in Indiana 4565 classrooms**
Day 55	Lesson 1 - Writing and Calling Functions	
Day 56	Lesson 2 - Function Inputs and Outputs	
Day 57	**Activity: Verification Function**	Activity: auto-graded
	Chapter 15: Designing Algorithms	
Day 58	Lesson 1 - Designing with Flowcharts	
Day 59	Lesson 2 - Writing Pseudocode	
Day 60	Lesson 3 - Common Math Algorithms	
Day 61	**Activity: Cat and Mouse**	Activity: auto-graded
Day 62	**Chapter Exam**	
	Chapter 17: Understanding Data	
Day 63	Lesson 1 - Extracting Info from Data	
Day 64	Lesson 2 - Challenges with Processing Data	
Day 65	Lesson 3 - Using Data in Programs	
Day 66	Lesson 4 - Data Compression	
Day 67	**Activity: Census Analysis**	Activity: teacher-graded
Day 68	**Chapter Exam**	

Days	CompuScholar Chapter and Lab	Notes
	Chapter 18: Impact of Computing	
Day 69	Lesson 1 - Digital Divide and Bias	
Day 70	Lesson 2 - Effects of Computing Innovations	
Day 71	Lesson 3 - Crowdsourcing and Citizen Science	Activity: teacher-graded
Day 72	**Activity: Impact Study**	
Day 73	**Chapter Exam**	
	Chapter 19: Legal and Ethical Concerns	
Day 74	Lesson 1 - Computing Ethics	
Day 75	Lesson 2 - Computing Laws	
Day 76	Lesson 3 - Intellectual Property	Activity: teacher-graded
Day 77	**Activity: Ethics Illustration**	
Day 78	**Chapter Exam**	
	Chapter 20: Cybersecurity	**Complete Lessons 2 and 3 only in Indiana 4565 classrooms**
Day 79	Lesson 2 - Computer Security	
Day 80	Lesson 3 - Social Engineering	
	Chapter 26: Operating Systems	**Complete Lessons 2 and 3 only in Indiana 4565 classrooms**
Day 81	Lesson 2 - Managing Your OS	
Day 82	Lesson 3 - Managing Your Applications	
	Supplemental Chapter 3: Additional Topics	**Can be completed at any time**
Day 83	Lesson 1 - Machine Learning and Generative AI	
Day 84	Lesson 2 - Structured Data Formats	
Day 85	Lesson 3 - Emerging Digital Trends	
85	**Days, Semester 1**	