

# CTE Industry Certifications Study Guide

5 High-Value Pathways • Grades 10–12

CompTIA IT Fundamentals • ServSafe Food Handler • OSHA 10  
Cosmetology Board Basics • CPR/AED Knowledge Review

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# Test-Taking Strategy Guide

Preparing for industry certification exams requires a strategic approach. These exams test both your factual knowledge and your ability to apply concepts in real-world scenarios. Use the strategies below to maximize your performance on test day.

## Before the Test

- **Create a Study Schedule:** Break down the topics over several weeks. Cramming the night before is rarely effective for comprehensive industry exams.
- **Use Active Recall:** Instead of just re-reading notes, test yourself using the flash cards and practice quizzes provided in this guide.
- **Understand, Don't Just Memorize:** Certification exams often present scenario-based questions. Understanding the 'why' behind a concept is crucial.
- **Simulate the Testing Environment:** Take the practice quizzes under timed conditions without notes to build stamina and identify weak areas.

## During the Test

- **Read Every Word:** Pay close attention to keywords like NOT, EXCEPT, ALWAYS, and NEVER. Missing a single word can change the entire meaning of the question.
- **Eliminate Wrong Answers:** If you aren't sure of the correct answer, eliminate the options you know are wrong. This increases your odds of guessing correctly.
- **Answer What You Know First:** Go through the exam and answer the easiest questions first. This builds confidence and ensures you don't miss easy points due to time constraints.
- **Don't Change Your First Answer:** Unless you have a concrete reason to change your answer, your first instinct is usually correct. Overthinking often leads to errors.
- **Manage Your Time:** Keep an eye on the clock. Calculate how much time you have per question and pace yourself accordingly.

## Handling Different Question Types

- **Multiple-Choice:** Look for the most complete and correct answer. Sometimes two options seem right, but one is more comprehensive.
- **Scenario-Based:** Read the scenario carefully, identify the core problem, and choose the solution that addresses the specific safety, technical, or procedural standard.
- **Process of Elimination:** If two options are exact opposites, the correct answer is usually one of them.

**Pro Tip:** Get a good night's sleep before the exam, eat a balanced meal, and arrive early. Anxiety is your biggest enemy on test day—preparation is the best way to beat it.

# Certification Pathway Comparison Chart

Use this chart to compare the five certification pathways covered in this guide. Each certification offers unique benefits and requires different areas of focus.

| Feature                            | CompTIA IT Fundamentals                     | ServSafe Food Handler                       | OSHA 10 General Industry                     | Cosmetology Board Basics                  | CPR/AED Review                                    |
|------------------------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|-------------------------------------------|---------------------------------------------------|
| <b>Industry</b>                    | Information Technology                      | Food Service & Hospitality                  | General Industry / Construction              | Beauty & Wellness                         | Healthcare / Emergency Response                   |
| <b>Career Focus</b>                | IT Support, Help Desk, Cybersecurity Basics | Chef, Server, Food Prep, Restaurant Manager | Safety Coordinator, Manufacturing, Warehouse | Hairstylist, Esthetician, Nail Technician | Lifeguard, Healthcare Provider, General Workplace |
| <b>Exam Format</b>                 | Multiple Choice                             | Multiple Choice                             | Online / Classroom Training                  | Written & Practical                       | Skills Demonstration & Written                    |
| <b>Key Topics</b>                  | Hardware, Software, Networking, Security    | Hygiene, Time/Temp Control, Allergens       | Hazard Recognition, PPE, Fall Protection     | Sanitation, Anatomy, Chemical Safety      | Chest Compressions, AED Use, Choking Relief       |
| <b>Validity</b>                    | Non-expiring (Foundational)                 | 3 Years                                     | Non-expiring (Recommended 5-year refresher)  | Varies by State (Requires CEUs)           | 2 Years                                           |
| <b>Difficulty Level (Gr 10-12)</b> | Moderate                                    | Beginner to Moderate                        | Beginner                                     | Moderate to High                          | Beginner                                          |

## Pathway 1: CompTIA IT Fundamentals (ITF+)

The CompTIA IT Fundamentals (ITF+) certification is an entry-level credential designed for those considering a career in IT. It validates foundational IT concepts, ensuring you understand basic computing, infrastructure, software development, and security. It is the perfect starting point for Grades 10–12 students exploring technology pathways.

**Exam Overview:** The ITF+ exam (FC0-U61) consists of 75 multiple-choice questions. You have 60 minutes to complete it. A passing score is 650 on a scale of 100–900. It focuses on IT literacy and foundational knowledge rather than advanced technical skills.

### Domain 1: IT Concepts and Terminology (17%)

This domain covers the basics of computing, including data representation, the value of data, and troubleshooting methodology.

- **Data Representation:** Computers use binary (base-2) systems, representing data as 0s and 1s (bits). A byte is 8 bits. Common units include Kilobyte (KB), Megabyte (MB), Gigabyte (GB), and Terabyte (TB).
- **Value of Data:** Data is a crucial organizational asset. Understanding data lifecycle (creation, storage, use, sharing, archiving, destruction) is key.
- **Troubleshooting Methodology:** Always follow a structured approach: 1) Identify the problem, 2) Establish a theory of probable cause, 3) Test the theory, 4) Establish a plan of action, 5) Verify full system functionality, 6) Document findings.

### Domain 2: Infrastructure (22%)

Infrastructure encompasses the physical and virtual components that make up a computer system and network.

- **Hardware:** Physical components like the CPU (processes instructions), RAM (temporary volatile memory), Motherboard (connects components), and Storage (HDD/SSD for permanent data).
- **Peripherals:** External devices connected to the computer (e.g., printers, monitors, keyboards, mice).
- **Networks:** A group of interconnected computers. A **LAN** (Local Area Network) covers a small area, while a **WAN** (Wide Area Network) covers a large geographic area.
- **Network Devices:** **Routers** connect different networks and direct traffic; **Switches** connect devices within a single network; **Access Points** allow wireless devices to connect to a wired network.

### Domain 3: Applications and Software (18%)

Software provides the instructions that tell the hardware what to do. This domain explores operating systems and application architecture.

- **Operating Systems (OS):** Manages hardware and software resources. Examples include Windows, macOS, and Linux. Mobile OS examples include iOS and Android.
- **Software Types:** **System software** runs the computer (OS, utilities), while **application software** performs user tasks (word processors, web browsers).
- **Web Browsers:** Software used to access the internet. Browsers render HTML, CSS, and JavaScript to display websites.
- **Software Architecture:** **Client-Server** model involves a central server providing resources to clients. **Peer-to-Peer (P2P)** allows all nodes to share resources equally.

**Key Distinction:** Remember that RAM is volatile (loses data when powered off), while storage like HDDs and SSDs is non-volatile (retains data without power).

## Domain 4: Software Development (15%)

Even if you aren't becoming a programmer, understanding how software is created is essential for IT literacy.

- **Programming Concepts:** A **variable** stores data, a **loop** repeats code, and a **conditional (if/then)** makes decisions based on conditions.
- **Data Types:** Integers (whole numbers), Floats (decimal numbers), Strings (text), and Booleans (True/False).
- **Development Lifecycle:** The process usually follows: Requirements gathering → Design → Development → Testing → Deployment → Maintenance.
- **Interpreted vs. Compiled:** **Compiled** languages (like C++) translate the whole program to machine code before running. **Interpreted** languages (like Python) translate and run the code line-by-line.

## Domain 5: Database Fundamentals (12%)

Databases are organized collections of data. Understanding how they store and retrieve information is a core IT skill.

- **Relational Databases:** Store data in tables (rows and columns) that are linked (related) to one another. Uses SQL (Structured Query Language) for management.
- **Non-Relational Databases (NoSQL):** Store data in flexible formats (like documents or key-value pairs), ideal for unstructured data.
- **Key Terms:** A **record** is a single row in a database table. A **field** is a single column. A **primary key** uniquely identifies each record.

## Domain 6: Security (16%)

Security is everyone's responsibility. This domain covers protecting systems, networks, and data from digital attacks.

- **The CIA Triad:** The core of information security. **Confidentiality** (preventing unauthorized access), **Integrity** (preventing unauthorized modification), and **Availability** (ensuring access for authorized users).

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- **Threats:** **Malware** (malicious software like viruses and ransomware), **Phishing** (fraudulent emails to steal info), and **Social Engineering** (manipulating people to give up confidential information).
  - **Access Controls:** Methods to restrict access. **Authentication** verifies who you are (e.g., passwords, biometrics). **Authorization** determines what you can do.
  - **Encryption:** Converting data into a secret code to prevent unauthorized reading. Data at rest and data in transit should both be encrypted.

**Core Security Principle: Defense-in-Depth means using multiple layers of security (firewalls, antivirus, strong passwords, user training) so if one layer fails, others still protect the system.**

## ITF+ Exam Day Reminders

- Read each question carefully—look for keywords like 'BEST', 'FIRST', or 'MOST LIKELY'.
- Eliminate the obviously incorrect answers first to improve your odds.
- Manage your time: 60 minutes for 75 questions gives you less than a minute per question. Don't spend too much time on one problem.

# Vocabulary Flash Cards — CompTIA IT Fundamentals

*Cut out or use as a quick reference to review key terms and definitions.*

|                                                                                                                      |                                                                                                                                     |                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Hardware</b>                                                                                                      | <b>Software</b>                                                                                                                     | <b>Operating System (OS)</b>                                                                                                 |
| The physical components of a computer system (e.g., CPU, monitor, keyboard).                                         | The set of instructions or programs that tell the computer hardware what to do.                                                     | System software that manages computer hardware, software resources, and provides common services for programs.               |
| <b>CPU (Central Processing Unit)</b>                                                                                 | <b>RAM (Random Access Memory)</b>                                                                                                   | <b>Hard Drive (HDD/SSD)</b>                                                                                                  |
| The primary component of a computer that performs the basic arithmetic, logic, controlling, and I/O operations.      | Volatile memory that temporarily stores data and machine code currently in use by the CPU.                                          | Non-volatile storage device used for permanent data storage. SSDs use flash memory; HDDs use magnetic disks.                 |
| <b>Motherboard</b>                                                                                                   | <b>Bandwidth</b>                                                                                                                    | <b>Latency</b>                                                                                                               |
| The main printed circuit board (PCB) that connects all components and peripherals of a computer.                     | The maximum rate of data transfer across a given path, measured in bits per second (bps).                                           | The delay before a transfer of data begins following an instruction, often called 'lag'.                                     |
| <b>Router</b>                                                                                                        | <b>Switch</b>                                                                                                                       | <b>IP Address</b>                                                                                                            |
| A networking device that forwards data packets between computer networks, directing traffic on the internet.         | A networking device that connects devices together on a local area network (LAN).                                                   | A numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication. |
| <b>MAC Address</b>                                                                                                   | <b>Protocol</b>                                                                                                                     | <b>Client-Server Model</b>                                                                                                   |
| A unique identifier assigned to a network interface controller (NIC) for use as a network address in communications. | A set of rules governing the exchange of data between devices (e.g., HTTP, FTP, SMTP).                                              | A network architecture where a central server provides resources to multiple client computers.                               |
| <b>Peer-to-Peer (P2P)</b>                                                                                            | <b>Variable</b>                                                                                                                     | <b>Loop</b>                                                                                                                  |
| A decentralized network model where all computers (peers) have equal status and share resources directly.            | A storage location paired with an associated symbolic name, which contains some known or unknown quantity of information (a value). | A sequence of instructions that is continually repeated until a certain condition is reached.                                |
| <b>Boolean</b>                                                                                                       | <b>Algorithm</b>                                                                                                                    | <b>Database</b>                                                                                                              |
| A data type that has one of two possible values (usually True or False).                                             | A step-by-step procedure for solving a problem or accomplishing a task in a finite number of steps.                                 | An organized collection of structured information or data, typically stored electronically in a computer system.             |

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## Practice Quiz — OSHA 10 General Industry

Test your knowledge with these 20 practice questions. Try to answer without looking at your notes first!

**1. At what height does OSHA require fall protection in General Industry?**

- A) 4 feet
- B) 6 feet
- C) 10 feet
- D) 15 feet

**2. What does OSHA stand for?**

- A) Occupational Safety and Health Administration
- B) Operational Safety and Hazard Agency
- C) Office of Safety and Health Administration
- D) Occupational Standards and Health Authority

**3. What is the purpose of the General Duty Clause?**

- A) To provide a minimum wage.
- B) To ensure employers provide a workplace free from recognized hazards.
- C) To mandate the use of PPE at all times.
- D) To outline specific chemical exposure limits.

**4. When climbing a ladder, you should always maintain:**

- A) 2 points of contact
- B) 3 points of contact
- C) 4 points of contact
- D) A safety harness

**5. What does LOTO stand for?**

- A) Look Out, Turn Off
- B) Lockout/Tagout
- C) Limit Out, Tag Out
- D) Lock Out, Take Over

**6. What type of fire involves flammable liquids like gasoline?**

- A) Class A
- B) Class B
- C) Class C
- D) Class D

**7. What does the 'P' stand for in the PASS method for fire extinguishers?**

- A) Point
- B) Push
- C) Pull
- D) Press

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**8. What does SDS stand for?**

- A) Safe Data Sheets
- B) Safety Data System
- C) Safety Data Sheet
- D) Standard Document Sheet

**9. On a GHS label, which signal word indicates a more severe hazard?**

- A) Caution
- B) Warning
- C) Danger
- D) Alert

**10. What is the last line of defense against workplace hazards?**

- A) Engineering controls
- B) Administrative controls
- C) PPE
- D) LOTO

**11. Which class of hard hat protects against high-voltage electrical conductors?**

- A) Class A
- B) Class C
- C) Class G
- D) Class E

**12. Ergonomics is the science of:**

- A) Fitting the job to the person.
- B) Fitting the person to the job.
- C) Evaluating chemical hazards.
- D) Managing fire safety protocols.

**13. A space that is large enough to enter, has limited entry/exit, and is not designed for continuous occupancy is a:**

- A) Hazardous zone
- B) Permit area
- C) Confined space
- D) Restricted zone

**14. What does GFCI stand for?**

- A) Ground Fault Circuit Interrupter
- B) General Fire Control Instrument
- C) Ground Fault Circuit Indicator
- D) General Facility Current Interrupter

**15. An unobstructed path of exit travel from any point in a building to a public way is known as:**

- A) An aisle
- B) A means of egress

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## Practice Quiz — CPR/AED Knowledge Review

Test your knowledge with these 20 practice questions. Try to answer without looking at your notes first!

**1. What is the correct rate for chest compressions during CPR?**

- A) 60-80 compressions per minute
- B) 80-100 compressions per minute
- C) 100-120 compressions per minute
- D) 120-140 compressions per minute

**2. How deep should you compress the chest for an adult victim?**

- A) At least 1 inch
- B) At least 2 inches
- C) At least 2.5 inches
- D) At least 3 inches

**3. What is the compression-to-ventilation ratio for a single rescuer on an adult?**

- A) 15:1
- B) 15:2
- C) 30:1
- D) 30:2

**4. What is the universal sign of choking?**

- A) Coughing loudly
- B) Clutching the throat
- C) Pointing to the stomach
- D) Holding the chest

**5. If a choking victim can cough forcefully and speak, what should you do?**

- A) Give abdominal thrusts immediately.
- B) Start CPR.
- C) Encourage them to keep coughing.
- D) Do a blind finger sweep.

**6. When performing abdominal thrusts on a conscious choking adult, where should you place your fist?**

- A) On the victim's chest.
- B) Directly over the navel (belly button).
- C) Just above the navel.
- D) Below the ribcage.

**7. What is the first step in using an AED?**

- A) Attach the pads to the victim.
- B) Press the shock button.
- C) Turn the AED on.

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D) Wipe the victim's chest.

**8. Where should you place the AED pads on an adult victim?**

- A) One on the chest, one on the back.
- B) One on the upper right chest, one on the lower left ribs.
- C) Both on the left side of the chest.
- D) One on the forehead, one on the chest.

**9. What must you do before pressing the shock button on an AED?**

- A) Check the victim's pulse.
- B) Ensure no one is touching the victim by shouting 'CLEAR!'.
- C) Remove the AED pads.
- D) Give two rescue breaths.

**10. What protects a lay rescuer from being sued for unintentional harm while providing emergency care in good faith?**

- A) Implied Consent
- B) The 911 Act
- C) Good Samaritan Laws
- D) Actual Consent

**11. How deep should you compress the chest for an infant?**

- A) About 0.5 inches
- B) About 1 inch
- C) About 1.5 inches
- D) About 2.5 inches

**12. Where do you check for a pulse on an infant?**

- A) On the wrist
- B) On the neck
- C) On the inside of the upper arm (brachial)
- D) On the ankle

**13. What technique should you use to give chest compressions to an infant?**

- A) The heel of one hand
- B) Two hands interlaced
- C) Two fingers in the center of the chest
- D) The palm of one hand

**14. What should you do if an unresponsive victim begins to vomit during CPR?**

- A) Stop CPR and wait for EMS.
- B) Roll the victim onto their side to clear the airway, then resume CPR.
- C) Give faster rescue breaths.
- D) Perform abdominal thrusts.

**15. What is the definition of 'Implied Consent'?**

- A) A responsive victim gives you permission to help.

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