CompTIA IT Fundamentals (ITF+) Certification Exam Objectives

EXAM NUMBER: FC0-U61

About the Exam

The CompTIA IT Fundamentals (ITF+) FC0-U61 exam will certify the successful candidate has the knowledge and skills required to identify and explain the basics of:

- **Computing**
- **IT infrastructure**
- **Software development**
- **Database use**

In addition, candidates will demonstrate their knowledge of:

- **Installing software**
- **Establishing basic network connectivity**
- **Identifying/preventing basic security risks**

Further, this exam will assess the candidate's knowledge in the areas of troubleshooting theory and preventive maintenance of devices. This exam is intended for candidates who are advanced end users, considering a career in IT, and interested in pursuing professional-level certifications, such as A+.

Note: This is a pre-professional certification for candidates seeking a career in IT.

EXAM DEVELOPMENT

CompTIA exams result from subject-matter expert workshops and industry-wide survey results regarding the skills and knowledge required of an entry-level IT professional.

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PLEASE NOTE

The lists of examples provided in bulleted format are not exhaustive lists. Other examples of technologies, processes or tasks pertaining to each objective may also be included on the exam although not listed or covered in this objectives document. CompTIA is constantly reviewing the content of our exams and updating test questions to be sure our exams are current and the security of the questions is protected. When necessary, we will publish updated exams based on existing exam objectives. Please know that all related exam preparation materials will still be valid.

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TEST DETAILS

Required exam	FC0-U61
Number of questions	75
Type of questions	Multiple choice
Length of test	60 minutes
Recommended experience	No prior experience necessary
Passing score	650 (on a scale of 900)

EXAM OBJECTIVES (DOMAINS)

The table below lists the domains measured by this examination
and the extent to which they are represented.

DOMAIN	PERCENTAGE OF EXAMINATION
1.0 IT Concepts and Terminology	17%
2.0 Infrastructure	22%
3.0 Applications and Software	18%
4.0 Software Development	12%
5.0 Database Fundamentals	11%
6.0 Security	20%
Total	**100%**

1.0 IT Concepts and Terminology

1.1 Compare and contrast notational systems.

- Binary
- Hexadecimal
- Decimal

- Data representation
  - ASCII
  - Unicode

1.2 Compare and contrast fundamental data types and their characteristics.

- Char
- Strings

- Numbers
  - Integers
  - Floats

- Boolean

1.3 Illustrate the basics of computing and processing.

- Input
- Processing

- Output
- Storage

1.4 Explain the value of data and information.

- Data and information as assets
- Importance of investing in security
- Relationship of data to creating information

- Intellectual property
  - Trademarks
  - Copyright
  - Patents
- Digital products

- Data-driven business decisions
  - Data capture and collection
  - Data correlation
  - Meaningful reporting

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1.5

Compare and contrast common units of measure.

- **Storage unit**
  - Bit
  - Byte
  - KB
  - MB
  - GB
    - TB
    - PB
- **Throughput unit**
  - bps
  - Kbps
  - Mbps
    - Gbps
    - Tbps
- **Processing speed**
  - MHz
  - GHz

1.6

Explain the troubleshooting methodology.

- **Identify the problem**
  - Gather information
  - Duplicate the problem, if possible
  - Question users
  - Identify symptoms
  - Determine if anything has changed
  - Approach multiple problems individually
- **Research knowledge base/ Internet, if applicable**
- **Establish a theory of probable cause**
  - Question the obvious
  - Consider multiple approaches
    - Divide and conquer

- **Test the theory to determine the cause**
  - Once the theory is confirmed (confirmed root cause), determine the next steps to resolve the problem
  - If the theory is not confirmed, establish a new theory or escalate
- **Establish a plan of action to resolve the problem and identify potential effects**
- **Implement the solution or escalate as necessary**
- **Verify full system functionality and, if applicable, implement preventive measures**
- **Document findings/lessons learned, actions, and outcomes**

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2.0 Infrastructure

2.1 Classify common types of input/output device interfaces.

- **Networking**
  - Wired
    - Telephone connector (RJ-11)
    - Ethernet connector (RJ-45)
  - Wireless
    - Bluetooth
    - NFC

- **Peripheral device**
  - USB
  - FireWire
  - Thunderbolt
  - Bluetooth
  - RF

- **Graphic device**
  - VGA
  - HDMI
  - DVI
  - DisplayPort
  - Mini DisplayPort

2.2 Given a scenario, set up and install common peripheral devices to a laptop/PC.

- **Devices**
  - Printer
  - Scanner
  - Keyboard
  - Mouse
  - Camera
  - External hard drive
  - Speakers
  - Display

- **Installation types**
  - Plug-and-play vs. driver installation
  - Other required steps
  - IP-based peripherals
  - Web-based configuration steps

2.3 Explain the purpose of common internal computing components.

- **Motherboard/system board**
- **Firmware/BIOS**
- **RAM**
- **CPU**
  - ARM
    - Mobile phone
    - Tablet
  - 32-bit
    - Laptop
    - Workstation
    - Server
  - 64-bit
    - Laptop
    - Workstation
    - Server

- **Storage**
  - Hard drive
  - SSD
- **GPU**
- **Cooling**
- **NIC**
  - Wired vs. wireless
  - On-board vs. add-on card

2.4 Compare and contrast common Internet service types.

- **Fiber optic**
- **Cable**
- **DSL**

- **Wireless**
  - Radio frequency
  - Satellite
  - Cellular

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2.5 Compare and contrast storage types.

- **Volatile vs. non-volatile**
- **Local storage types**
  - RAM
  - Hard drive
    - Solid state vs. spinning disk
  - Optical
- Flash drive
- **Local network storage types**
  - NAS
  - File server
- **Cloud storage service**

2.6 Compare and contrast common computing devices and their purposes.

- **Mobile phones**
- **Tablets**
- **Laptops**
- **Workstations**
- **Servers**
- **Gaming consoles**

- **IoT**
  - Home appliances
  - Home automation devices
    - Thermostats
    - Security systems

- Modern cars
- IP cameras
- Streaming media devices
- Medical devices

2.7 Explain basic networking concepts.

- **Basics of network communication**
  - Basics of packet transmission
  - DNS
    - URL-to-IP translation
  - LAN vs. WAN
- **Device addresses**
  - IP address
  - MAC address

- **Basic protocols**
  - HTTP/S
  - POP3
  - IMAP
  - SMTP
- **Devices**
  - Modem
  - Router

- Switch
- Access point
- Firewall

2.8 Given a scenario, install, configure and secure a basic wireless network.

- **802.11a/b/g/n/ac**
  - Older vs. newer standards
  - Speed limitations
  - Interference and attenuation factors
- **Best practices**
  - Change SSID
  - Change default password

- Encrypted vs. unencrypted
  - Open
    - Captive portal
  - WEP
  - WPA
  - WPA2

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3.0 Applications and Software

3.1 Explain the purpose of operating systems.

- **Interface between applications and hardware**
- **Disk management**
- **Process management/scheduling**
  - Kill process/end task
- **Application management**
- **Memory management**
- **Device management**
- **Access control/protection**
- **Types of OS**
  - Mobile device OS
  - Workstation OS
- Server OS
- Embedded OS
  - Firmware
- Hypervisor (Type 1)

3.2 Compare and contrast components of an operating system.

- **File systems and features**
  - File systems
    - NTFS
    - FAT32
    - HFS
    - Ext4
- **Features**
  - Compression
  - Encryption
  - Permissions
  - Journaling
  - Limitations
  - Naming rules
- **File management**
  - Folders/directories
  - File types and extensions
  - Permissions
- **Services**
- **Processes**
- **Drivers**
- **Utilities**
  - Task scheduling
- **Interfaces**
  - Console/command line
  - GUI

3.3 Explain the purpose and proper use of software.

- **Productivity software**
  - Word processing software
  - Spreadsheet software
  - Presentation software
  - Web browser
  - Visual diagramming software
- **Collaboration software**
  - Email client
  - Conferencing software
  - Instant messaging software
- Online workspace
- Document sharing
- **Business software**
  - Database software
  - Project management software
  - Business-specific applications
  - Accounting software

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3.4 Explain methods of application architecture and delivery models.

- **Application delivery methods**
  - Locally installed
    - Network not required
    - Application exists locally
    - Files saved locally
  - Local network hosted
    - Network required
    - Internet access not required
  - Cloud hosted
    - Internet access required
    - Service required
    - Files saved in the cloud
- **Application architecture models**
  - One tier
  - Two tier
  - Three tier
  - n-tier

3.5 Given a scenario, configure and use web browsers.

- **Caching/clearing cache**
- **Deactivate client-side scripting**
- **Browser add-ons/extensions**
  - Add
  - Remove
  - Enable/disable
- **Private browsing**
- **Proxy settings**
- **Certificates**
  - Valid
  - Invalid
- **Popup blockers**
- **Script blockers**
- **Compatible browser for application(s)**

3.6 Compare and contrast general application concepts and uses.

- **Single-platform software**
- **Cross-platform software**
  - Compatibility concerns
- **Licensing**
  - Single use
  - Group use/site license
  - Concurrent license
- Open source vs. proprietary
- Subscription vs. one-time purchase
- Product keys and serial numbers
- **Software installation best practices**
  - Reading instructions
  - Reading agreements
  - Advanced options

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4.0 Software Development Concepts

4.1 Compare and contrast programming language categories.

- **Interpreted**
  - Scripting languages
  - Scripted languages
  - Markup languages
- **Compiled programming languages**
- **Query languages**
- **Assembly language**

4.2 Given a scenario, use programming organizational techniques and interpret logic.

- **Organizational techniques**
  - Pseudocode concepts
  - Flow-chart concepts
    - Sequence
- **Logic components**
  - Branching
  - Looping

4.3 Explain the purpose and use of programming concepts.

- **Identifiers**
  - Variables
  - Constants
- **Containers**
  - Arrays
  - Vectors
- **Functions**
- **Objects**
  - Properties
  - Attributes
  - Methods

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5.0 Database Fundamentals

5.1 Explain database concepts and the purpose of a database.

- **Usage of database**
  - Create
  - Import/input
  - Query
  - Reports
- **Flat file vs. database**
  - Multiple concurrent users

- Scalability
- Speed
- Variety of data
- **Records**
- **Storage**
  - Data persistence

5.2 Compare and contrast various database structures.

- **Structured vs. semi-structured vs. non-structured**
- **Relational databases**
  - Schema
  - Tables
    - Rows/records

- Fields/columns
  - Primary key
  - Foreign key
- Constraints
- **Non-relational databases**
  - Key/value databases
  - Document databases

5.3 Summarize methods used to interface with databases.

- **Relational methods**
  - Data manipulation
    - Select
    - Insert
    - Delete
    - Update
  - Data definition
    - Create
    - Alter
    - Drop
    - Permissions
- **Database access methods**

- Direct/manual access
- Programmatic access
- User interface/utility access
- Query/report builders
- **Export/import**
  - Database dump
  - Backup

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6.0 Security

6.1 Summarize confidentiality, integrity and availability concerns.

- **Confidentiality concerns**
  - Snooping
  - Eavesdropping
  - Wiretapping
  - Social engineering
  - Dumpster diving

- **Integrity concerns**
  - Man-in-the-middle
  - Replay attack
  - Impersonation
  - Unauthorized information alteration

- **Availability concerns**
  - Denial of service
  - Power outage
  - Hardware failure
  - Destruction
  - Service outage

6.2 Explain methods to secure devices and best practices.

- **Securing devices (mobile/workstation)**
  - Antivirus/Anti-malware
  - Host firewall
  - Changing default passwords
  - Enabling passwords
  - Safe browsing practices
  - Patching/updates

- **Device use best practices**
  - Software sources
    - Validating legitimate sources
    - Researching legitimate sources
    - OEM websites vs.
      third-party websites
  - Removal of unwanted software

- Removal of unnecessary software
- Removal of malicious software

6.3 Summarize behavioral security concepts.

- **Expectations of privacy when using:**
  - The Internet
    - Social networking sites
    - Email
    - File sharing
    - Instant messaging
  - Mobile applications

- Desktop software
- Business software
- Corporate network
- **Written policies and procedures**
- **Handling of confidential information**
  - Passwords
  - Personal information

- Customer information
- Company confidential information

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6.4 Compare and contrast authentication, authorization, accounting and non-repudiation concepts.

- **Authentication**
  - Single factor
  - Multifactor
  - Examples of factors
    - Password
    - PIN
    - One-time password
    - Software token
    - Hardware token
    - Biometrics
    - Specific location
    - Security questions
    - Single sign-on
- **Authorization**
  - Permissions
  - Least privilege model
  - Role-based access
    - User account types
  - Rule-based access
  - Mandatory access controls
  - Discretionary access controls
- **Accounting**
  - Logs
  - Tracking
  - Web browser history
- **Non-repudiation**
  - Video
  - Biometrics
  - Signature
  - Receipt

6.5 Explain password best practices.

- **Password length**
- **Password complexity**
- **Password history**
- **Password expiration**
- **Password reuse across sites**
- **Password managers**
- **Password reset process**

6.6 Explain common uses of encryption.

- **Plain text vs. cipher text**
- **Data at rest**
  - File level
  - Disk level
- Mobile device
- **Data in transit**
  - Email
  - HTTPS
- VPN
- Mobile application

6.7 Explain business continuity concepts.

- **Fault tolerance**
  - Replication
  - Redundancy
    - Data
    - Network
    - Power
  - Backup considerations
    - Data
      - File backups
- Critical data
  - Database
  - OS backups
- Location
  - Stored locally
  - Cloud storage
  - On-site vs. off-site
- Contingency plan
- **Disaster recovery**
  - Data restoration
  - Prioritization
  - Restoring access

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CompTIA IT Fundamentals (ITF+) Acronyms

The following is a list of acronyms that appear on the CompTIA IT Fundamentals (ITF+) exam. Candidates are encouraged to review the complete list and attain a working knowledge of all listed acronyms as part of a comprehensive exam preparation program.

ACRONYM	SPELLED OUT	ACRONYM	SPELLED OUT
AC	Alternating Current	EMI	Electromagnetic Interference
ACL	Access Control List	eSATA	External Serial Advanced Technology Attachment
AES	Advanced Encryption Standard	ESD	Electrostatic Discharge
AIO	All In One	EULA	End-User License Agreement
APIPA	Automatic Private Internet Protocol Addressing	FAT	File Allocation Table
ARM	Advanced RISC Machines	FAT32	32-bit File Allocation Table
ARP	Address Resolution Protocol	FTP	File Transfer Protocol
ASCII	American Standard Code for Information Interchange	FTPS	File Transfer Protocol over Secure Sockets Layer
		Gb	Gigabit
BD-ROM	Blu-ray Disc-Read-Only Memory	GB	Gigabyte
BIOS	Basic Input/Output System	Gbps	Gigabit per second
CAD	Computer-Aided Design	GHz	Gigahertz
CAM	Computer-Aided Manufacturing	GPS	Global Positioning System
CD	Compact Disc	GPU	Graphics Processing Unit
CD-ROM	Compact Disc-Read-Only Memory	GUI	Graphical User Interface
CD-RW	Compact Disc-Rewritable	HDD	Hard Disk Drive
CPU	Central Processing Unit	HDMI	High-Definition Media Interface
CRUD	Create, Read, Update, Delete	HFS	Hierarchical File System
CSS	Cascading Style Sheets	HTML	Hypertext Markup Language
DC	Direct Current	HTTP	Hypertext Transfer Protocol
DDL	Data Definition Language	HTTPS	Hypertext Transfer Protocol Secure
DDoS	Distributed Denial of Service	ICMP	Internet Control Message Protocol
DDR	Double Data-Rate	IDS	Intrusion Detection System
DHCP	Dynamic Host Configuration Protocol	IMAP	Internet Mail Access Protocol
DIMM	Dual Inline Memory Module	IOPS	Input/Output Operations Per Second
DLL	Dynamic Link Layer	IoT	Internet of Things
DLP	Data Leak Prevention	IP	Internet Protocol
DML	Data Manipulation Language	IPS	Intrusion Prevention System
DNS	Domain Name Service or Domain Name Server	IR	Infrared
DoS	Denial of Service	ISP	Internet Service Provider
DSL	Digital Subscriber Line	Kb	Kilobit
DVD	Digital Video Disc or Digital Versatile Disc	KB	Kilobyte or Knowledge Base
DVD-R	Digital Video Disc-Recordable	Kbps	Kilobit per second
DVD-RW	Digital Video Disc-Rewritable	LAN	Local Area Network
DVI	Digital Visual Interface	MAC	Media Access Control

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ACRONYM	SPELLED OUT	ACRONYM	SPELLED OUT
Mb	Megabit	Tb	Terabit
MB	Megabyte	TB	Terabyte
Mbps	Megabit per second	Tbps	Terabits per second
MHz	Megahertz	TCP	Transmission Control Protocol
MITM	Man in the Middle	TCP/IP	Transmission Control Protocol/Internet Protocol
MP3	Moving Picture Experts Group Layer 3 Audio	TKIP	Temporal Key Integrity Protocol
MP4	Moving Picture Experts Group Layer 4	TLS	Thread Local Storage
NAS	Network Attached Storage	UPS	Uninterruptable Power Supply
NDA	Non-Disclosure Agreement	URL	Uniform Resource Locator
NFC	Near Field Communications	USB	Universal Serial Bus
NIC	Network Interface Card	VGA	Video Graphics Array or Video Graphics Adapter
NTFS	New Technology File System	VoIP	Voice over Internet Protocol
OEM	Original Equipment Manufacturer	VPN	Virtual Private Network
OS	Operating System	WAN	Wide Area Network
PB	Petabyte	WAP	Wireless Access Point
PC	Personal Computer	WEP	Wired Equivalency Privacy
PCI	Peripheral Component Interconnect	WIFI	Wireless Fidelity
PCIe	Peripheral Component Interconnect Express	WLAN	Wireless Local Area Network
PII	Personally Identifiable Information	WPA	Wireless Protected Access
PIN	Personal Identification Number	WPA2	Wireless Protected Access 2
POP	Post Office Protocol		
POP3	Post Office Protocol 3		
PSU	Power Supply Unit		
PXE	Preboot Execution Environment		
RAID	Redundant Array of Independent Disks		
RAM	Random Access Memory		
RF	Radio Frequency		
RJ	Registered Jack		
RJ-11	Registered Jack Function 11		
RJ-45	Registered Jack Function 45		
ROM	Read-Only Memory		
SaaS	Software as a Service		
SATA	Serial Advanced Technology Attachment		
SD Card	Secure Digital Card		
SFTP	Secure File Transfer Protocol		
SID	System Identifier		
SMB	Server Message Block		
SMTP	Simple Mail Transfer Protocol		
SNMP	Simple Network Management Protocol		
SOHO	Small Office, Home Office		
SQL	Structured Query Language		
SSD	Solid State Drive		
SSID	Service Set Identifier		
SSO	Secure Sign-On		
SSL	Secure Sockets Layer		

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CompTIA IT Fundamentals (ITF+) Proposed Hardware and Software List

CompTIA has included this sample list of hardware and software to assist candidates as they prepare for the CompTIA IT Fundamentals (ITF+) exam. This list may also be helpful for training companies that wish to create a lab component for their training offering. The bulleted lists below each topic are sample lists and not exhaustive.

EQUIPMENT
- Workstations – unpackaged workstations
- Wireless router
- Cable modem
- Laptop
- Basic printer
- External storage devices
    - Hard drive
    - Solid state drive
- Tablet/smartphone
- Power strip/UPS
- Physical networking devices

SPARE PARTS/HARDWARE
- Flash drive (for backup)
- Various cable types

TOOLS
- ESD wrist band (for demonstration)
- Internet connectivity

SOFTWARE
- OS media
    - Windows
    - Linux
- Unconfigured OS images
- Anti-malware software
- Productivity software
- Collaboration software
- Browser software
- Backup software
- Database software
- Software development packages (IDE)