Chapter 1

Scientific Terminology

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Course Information

- Announcements: Email & Moodle
- Discussion & Questions: Email
- Resources:
  - Readings will be announced/distributed on Moodle
- Grading
  - Final Exam 100%

Outline

- Course information
- Chapter 1: Scientific Terminology

Course Content

Chapter 1: Scientific Terminology

- Academic (lecture, tutorial, practical, assignment, …)
- Hardware
- Software

Chapter 2: Written expression techniques

- Taking notes
- Writing report
- Writing a summary and an internship report
- Writing a dissertation

Chapter 3: Oral expression techniques

- Use of modern means of communication (general communication, communication methods, presentation..)

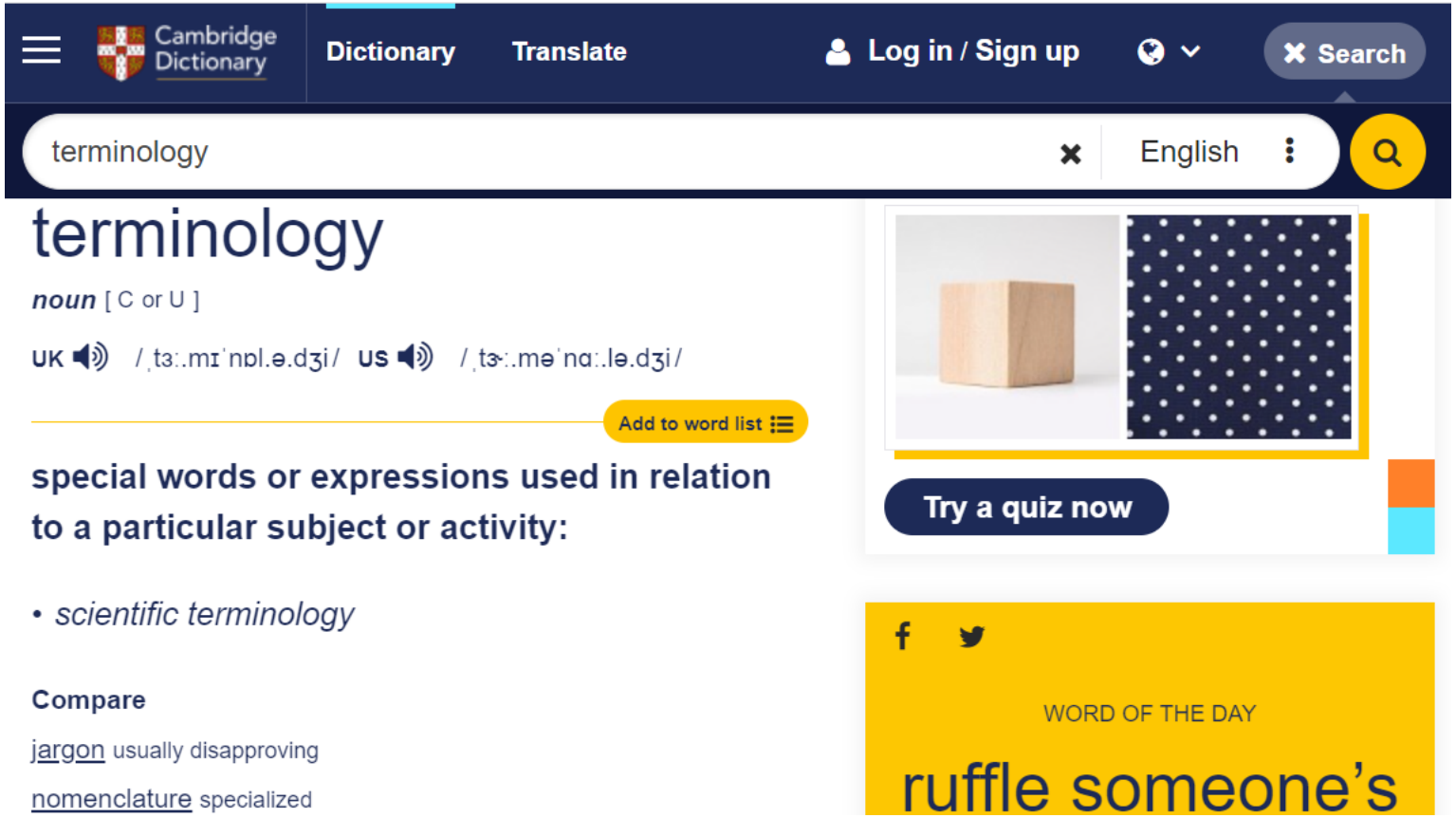
Chapter 4: Expression and communication in a group

Chapter 1: Scientific Terminology

- Introduction
- Academic terminology
- Terminology Related to Hardware
- Terminology Related to Software

Terminology

- Specific language, words, and expressions used within a particular field, subject, or discipline.



Why terminology is important ?

- **Clarity of Communication:** Understanding the specific terminology of a field enables effective and precise communication among professionals

- **Facilitates Learning:** Familiarity with the terminology accelerates the learning process, making it easier to grasp complex concepts and ideas within the domain

- **Efficient Collaboration:** It facilitates smoother collaboration among experts within the field, as they share a common language and understanding

- **Professional Credibility:** Demonstrating knowledge of specialized terminology establishes professional credibility and expertise in the respective field

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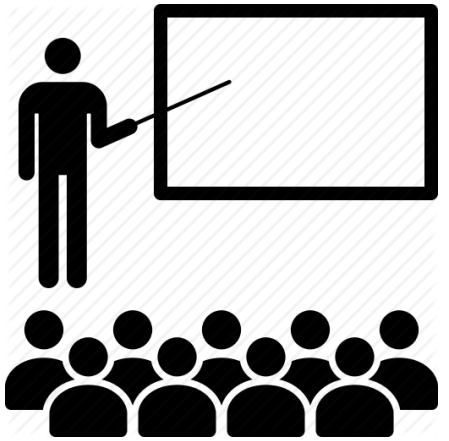
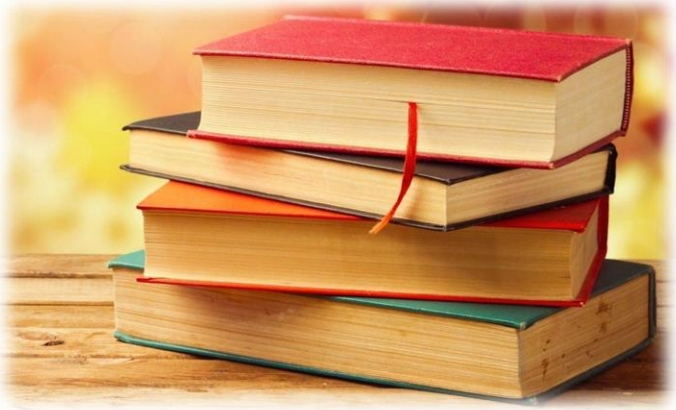
Academic Terminology (1)

- **Campus:** the physical location where a university is situated, including its buildings, grounds, and facilities.
- **Freshman**: A student in their first year of college or university.
- **Undergraduate**: Student pursuing a bachelor's degree.
- **Degree**: Academic qualification earned upon completion of a program.
- **Graduate Student**: Pursuing advanced studies beyond a bachelor's degree.



Academic Terminology (2)

- **Lecture:** A formal presentation by an instructor to teach a specific topic.
- **Tutorial:** Small-group session for interactive discussions and additional learning.
- **Practical (Lab):** Hands-on session where students apply theoretical knowledge.
- **Seminar:** Intensive discussion on specific topics in a small group.
- **Workshop:** Interactive session for skill development.
- **Assignment:** Task or project given to assess understanding.



Academic Terminology (3)

- **Semester:** A specific period of academic study, typically lasting half of an academic year.
- **Core Curriculum:** A set of required courses providing a foundational education across various disciplines.
- **Prerequisite:** A course or condition that must be completed before a student is allowed to take a more advanced course.
- **Transcript:** official record of a student's academic performance.
- **Plagiarism:** Using someone else's work without proper attribution.

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Information and Communications Technology

- ICT encompasses technologies used for communication and information processing.
- A set of technological tools and resources used for tasks such as transmitting, storing, creating, sharing, and accessing information.
- This includes devices like computers, communication systems, software applications, and networking technologies.

Introduction to Computer Science

- **Definition:** the study of computers and how they can be used

- **Principal areas of study:**
  - Programming: Writing instructions for computers to perform tasks.
  - Algorithms: Step-by-step procedures for solving problems.
  - Data Structures: Organizing and managing data for efficient processing.
  - Artificial Intelligence: Creating intelligent systems that can learn and make decisions.
  - Cybersecurity: Protecting computer systems and networks from threats.

Importance of Computer Science

- **Driving Technological Innovation:** Computer Science fuels advancements in technology, from smartphones to artificial intelligence.
- **Empowering Industries:** It plays a crucial role in finance, healthcare, entertainment, and more.
- **Solving Complex Problems:** Computer Science provides tools to tackle challenges in various domains.
- **Enabling Communication and Connectivity:** The internet and communication technologies are built on computer science principles.

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Computers

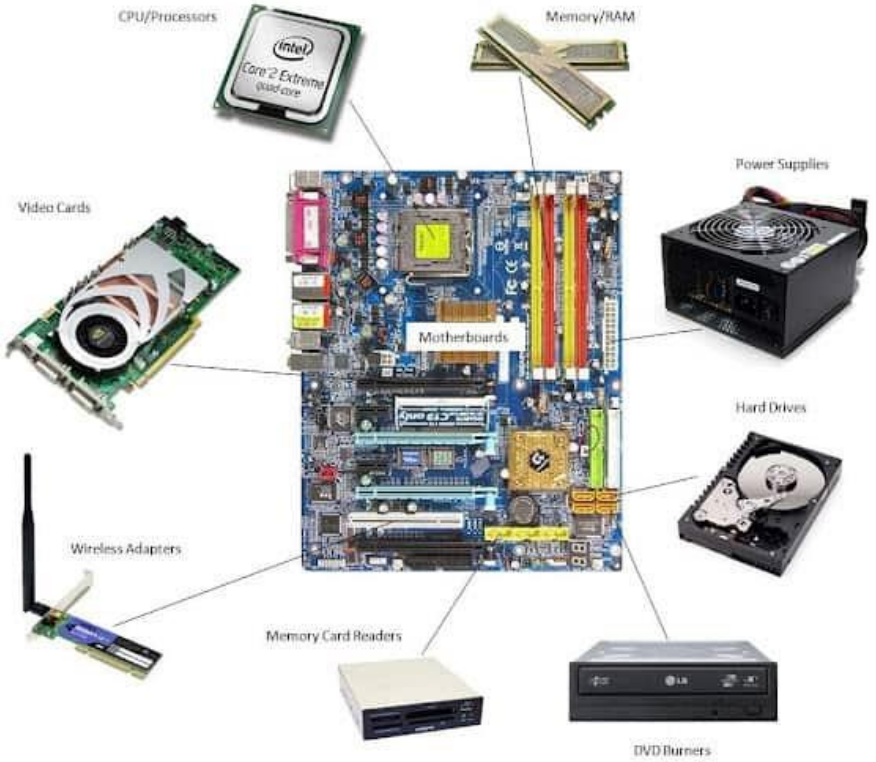
- A computer is an electronic device that processes data and performs tasks according to a set of instructions.
  - Components: Central Processing Unit (CPU), Memory, Input/Output Devices.

- Types of Computers
  - Personal Computers (PCs), Supercomputer, mainframe, Tablets and Smartphones, …

- Computers consist of two main components:
  - Hardware includes physical parts: Motherboard, CPU, RAM, Graphics Card Storage Device, Network Card.
  - Software comprises programs and instructions: OS, browsers, games.

Motherboard

- Basic computer component consisting of printed circuit boards and connection ports.
- Supports all hardware components (RAM, graphics card, processor, sound card, etc.).
- the role of the motherboard is to centralize and process the data exchanged in a computer with the help of the processor
- The motherboard manages the hard disk, keyboard, mouse, and network USB ports...

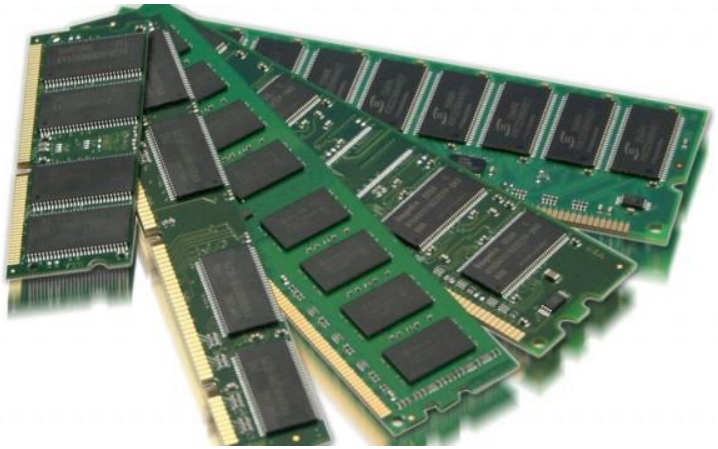


Processor

- The processor is the brain of the computer, orchestrating the exchange of data between the various components (hard disk, RAM memory, graphics card).
- Executes program instructions stored in the memory.
- The processor is characterized by its frequency, i.e. the rate at which it executes instructions.
- A processor clocked at 800 MHz will perform roughly 800 million operations per second.
- The first microprocessor (Intel 4004) was invented by Intel engineers Marcian Hoff and Federico Faggin in 1971.

Random Access Memory (RAM)

- RAM (Random Access Memory) is a temporary (volatile) storage component for the computer.
- The Random Access Memory (RAM) allows to storage and access of information in a quick and temporary manner.
- Its major advantage is that it can be read very quickly compared with a hard disk and other storage components.



Hard disk

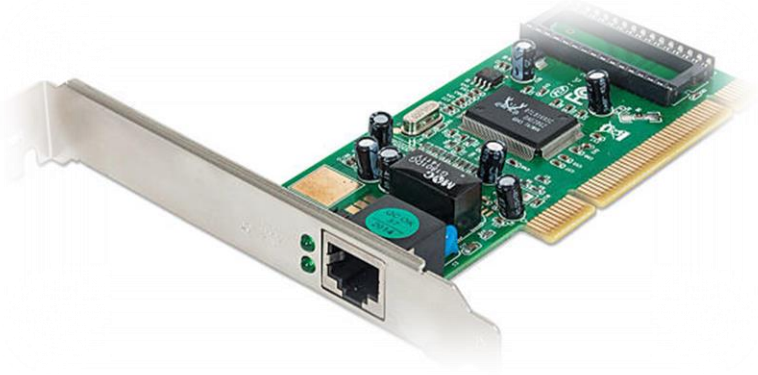
- One of the main components of a computer.
- It's a non-volatile mass memory used to store data permanently.
  - unlike RAM, which is erased each time the computer is restarted.
- Hard disks have a greater storage capacity than RAM.
- The hard disk contains the operating system (OS), your installed programs, and your personal data.
- There are two categories of hard disk: HDD and SSD.

Graphics card

- A graphics card is a hardware component that allows your computer to display images on the screen.
- It is also called a video card, a display adapter, or a graphics processing unit (GPU).
- A graphics card has its own memory and processor that can handle complex graphics tasks, such as rendering 3D scenes, playing videos, and running games
- different types and models of graphics cards. Some of the most popular brands of graphics cards are NVIDIA, AMD, and Intel

Network card

- A device that allows the computer to communicate with other devices on a network, such as the Internet.
- It is installed on the motherboard and connects to the network via RJ45 cable.
- There are different types of network cards: ethernet card, Wi-Fi card, Bluetooth card.



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Internet and Web Technologies (1)

- **Browser:** Software used to access and navigate websites on the internet.
- **URL (Web Address):** A web page's unique address on the internet.
- **Search Engine:** A tool to find information on the web by entering keywords.
- **Cache:** A temporary storage area in a computer's memory for frequently accessed data.
- **Download:** The process of copying files from the internet to a local device.
- **Upload:** The process of sending files from a local device to the internet.
- **Bookmark:** A saved link to a webpage, allowing easy access for future reference.

Internet and Web Technologies (2)

- **Portal**: A webpage, website, or service that acts as a gateway to other websites on the internet.
- **Search Engine**: A tool that enables users to search the internet for specific keywords and locate related websites.
- **Server**: A computer that provides services to other computers, known as clients, in a networked environment.
- **Streaming**: Playing audio or video in real-time directly from a website.
- **VoIP**: Abbreviation for Voice over Internet Protocol, allowing audio communication via the internet instead of traditional telephones.

Internet and Web Technologies (3)

- **Internet Service Provider (ISP):** A company that provides internet access.
- **Cyberspace:** The digital environment where online activities take place.
- **Domain Name:** A unique name that identifies a website on the internet.
- **Bot:** Short for robot, a software application that performs automated tasks, often on the internet.
- **Audioconferencing or Audio Conferencing:** Technology that enables multiple participants to have a conversation over audio channels, often used in remote meetings.
- **Broadband:** High-speed internet connection capable of transmitting large amounts of data.

Data Science and Analytics

- **Big Data:** Large volumes of data that traditional processing methods struggle to handle.
- **Machine Learning:** A subset of artificial intelligence focused on algorithms that learn from data.
- **Data Mining:** The process of extracting valuable patterns or information from large datasets.
- **Business Intelligence (BI):** Technologies, applications, and practices for data analysis.

Virtual Reality (VR) and Augmented Reality (AR)

- **Virtual Reality (VR):** A simulated environment created by computer technology.
- **Augmented Reality (AR):** Overlaying digital information onto the real world through a device.
- **Headset:** The hardware used to experience virtual or augmented reality.
- **Haptic Feedback:** Technology that provides tactile sensations to the user during VR or AR experiences.

Software and Systems (1)

- **Operating System:** Software that manages computer hardware and provides user interfaces.
- **Boot**: The process of starting up a computer and loading the operating system.
- **BIOS**: Basic Input/Output System, firmware used to boot up a computer and initialize hardware components.
- **Firmware**: Software written to a ROM (Read Only Memory) chip by the manufacturers.
- **Freeware**: Software that can be used without payment, though there may be restrictions on distribution.
- **ASCII**: A character encoding standard that represents text in computers. Each character is assigned a unique numerical value.
- **CODEC**: Short for COmpressor / DECompressor or COder / DECoder, used to encode and decode digital media.
- **Open Source**: Software provided free of charge, along with the original source code for modification and improvement.

Software and Systems (2)

- **Compatibility**: Pieces of hardware and/or software capable of being used together without issues.
- **Backup**: A copy of data made to protect against data loss in case of hardware failure, data corruption, or other unforeseen events.
- **Directory**: A location on a disc containing grouped files and subdirectories for organizational purposes.
- **Executable**: A program that has been converted (compiled) into binary machine code and can be run by a computer.
- **Plug-in**: Additional software required by a web browser to run specific elements of a web page.

Programming Related Terms

- **Source Code**: The human-readable form of a computer program before it is compiled into machine code.
- **Compiler**: Software that translates human-readable source code into machine code.
- **Binary File**: A file format that contains data in a format that is not human-readable, often used for storing non-text information.
- **Compression**: A technique that reduces the amount of space required to store data.
- **Bug**: a logical fault in a computer program which causes it to malfunction
- **Debug**: The process of testing and removing bugs or errors from a program.
- **Case Sensitivity**: The distinction between uppercase and lowercase letters in a programming language or software.

Cybersecurity Terminology

- **Vulnerability:** A weakness in a system that can be exploited to compromise its security.
- **Malware**: Software designed to harm or exploit devices or networks.
- **Phishing**: A fraudulent attempt to obtain sensitive information, often through deceptive emails or websites.
- **Authentication:** The process of verifying the identity of a user, device, or system to ensure that they have legitimate access to resources.
- **Firewall**: A network security device that monitors and filters incoming and outgoing network traffic.
- **Encryption**: The process of converting data into a code to prevent unauthorized access.
- Cyberattack