Hardware, Software, Firmware …

Hardware

Any physical part of the computer system. You can pretty much say "If I can touch it, hold it, drop it, then it's hardware" (well, perhaps not such a good idea to try dropping it).

Software

Any computer code or data – the stuff processed by the computer – program files, data files, image files, audio files … and, generally, software can be changed.

Firmware

A special kind of software that cannot be changed: software stored in ROM, for example. BIOS is treated as firmware.

What are the principal elements of hardware within a PC?

Power Supply Unit [PSU]

A standard PC-AT motherboard requires a zero Volt [0V] ground rail, and supply lines at +5V and +12V. It also requires smaller current supplies at -5V and -12V. Modern boards also require a +3.3V rail. These are all DC [Direct Current]
Since mains electricity in the UK is 240V AC [Alternating Current], the PC needs a power supply to convert that to something which will enable the motherboard to work, rather than causing it to burn or explode.
The Power Supply Unit (computer) page on Wikipedia goes into some good detail.

Motherboard

The motherboard is central to any PC. This is the main circuit board which contains the PC's clock and clock battery, BIOS chip, sockets for the CPU and RAM, various controller chips for input/output, memory, interfaces and so on. Many motherboards also contain some kind of audio interface chip and associated sockets for microphone, headphones and loudspeakers. Some also have a video display port.
Motherboards also have a number of sockets, into which either sub-boards or cables can be connected, to enable other devices to be attached. Sub-boards might include video card, expansion cards, network card and any specialised input/output port[1] the user might require.
Modern motherboard interfaces might include a number of SATA ports, several USB2 ports, a few USB3 ports, a video port of some kind, and some still have at least one "old fashioned" PS/2 port for a mouse or keyboard.

Central Processing Unit [CPU]

Sometimes referred to as "the chip", the CPU is the main processor or "brain" of the PC. It is often also the single most expensive component part. High-specification modern CPUs actually contain several processor "cores" – in other words, several very fast processors, capable of sharing the work between them, to make the machine even faster and more efficient.

[1] A port is an interface between a computer and other computers or peripheral devices.

For example, among AMD's current Ryzen processors, the "top" model (as I write this), the Threadripper 2990WX, boasts a staggering 32 cores, each of which can handle two processing threads, giving a massive 64 threads. At a more affordable price, something like the Ryzen 7 model 2700X offers 8 cores with 16 threads, and is more than adequate for an excellent gaming machine or (in my case) a powerful professional music studio. You can check out the latest specification CPUs on the websites of the two main processor manufacturers, AMD and Intel.

Random Access Memory [RAM]

A computer won't do a lot unless it's got somewhere to store the data it is processing. RAM is memory that the computer can access at any point – a bit like the way you can open a book at any page. It can be updated at any time. It is volatile storage – that means, when the computer is powered down (switched off) the contents of RAM are lost.

The first desktop computers (back in the 1970s when I were a lad) had only a few kilobytes of RAM. By the mid 1990s this had increased to a few megabytes. Good modern motherboards will now support typically 64 gigabytes of RAM. As a rough idea, 2GB is adequate for Windows 10 on a netbook, 4GB a reasonable amount for a general-purpose PC or laptop, with rather more for serious gamers, music/video production work, or serious scientific research and statistical analysis.

Hard Disk Drive or Solid State Drive [HDD/SSD]

Since sometime in the mid 1980s, most PCs have used a hard disk drive or HDD as the main non-volatile [or **persistent**[2]] form of storage. Again, like RAM, their storage capacity has increased over the years. In 1982, a 5 megabyte hard drive was considered a great luxury in a school computer room. (Yes, just one of them, shared around a network of 8 or 12 machines!) By the mid 1990s, 200 megabytes or so was considered "comfortable" for a good PC. By about 2002 or so, it was 40 gigabytes. A modern laptop may well have a HDD with 1 terabyte capacity

But size isn't everything. Although still a lot more expensive per gigabyte, solid state drives [SSDs] are vastly faster (and quieter). The immediate advantages are that a PC will boot a lot faster from a SSD than form a HDD; it will save work faster, games that use the disk space while running will run faster, music and video work will have fewer glitches… Another great advantage for a laptop is that SSDs are rather lighter weight than HDDs. Add to that the fact that SSDs have no moving parts, and you'll realise they're a bit more robust, less prone to damage, and (in theory) less likely to wear out (although, at the moment, there are still some electronic components within SSDs which don't last forever).

Clock battery

Even when switched off, disconnected from the power (or with its main battery removed in the case of a laptop) a PC still need for its clock to remain active, and keep the right date and time. To do this, there is a small battery mounted on the motherboard. It will typically last many years. On most workstation motherboards, the battery is a CR2032 – it's about the diameter of a 10p coin, and a little thicker.

[2] Non-volatile [persistent] storage: storage that doesn't lose the data stored in it when the power is removed.

Connections

HDD:

Up to 2003, most PC hard drives used IDE [PATA] parallel connecting ribbon cables to link to the motherboard.
Since 2003 (and certainly since around 2010) almost all manufacturers have moved to SATA connections. They're faster, and, since they use fewer strands of cable they're both cheaper and a good deal tidier inside the computer case. The tidiness factor is important since modern processors require good cooling, and cooling can be better achieved if air can actually flow round inside the PC case.

SSD:

Since they're newer technology, almost all SSDs use SATA connectors.

CD/DVD RW drive:

A great many PCs still use these. Again, on older machines, they'll be IDE [PATA], and on more recent machines SATA.

HDDs, SSDs and CD/DVD RW drives also require connections to the PSU – this is taken care of by cables fitted to the PSU, although they're different for IDE/PATA and newer SATA drives, so you need either a PSU with the right kind of cable, or a rather messy spaghetti of adaptor leads (which, as I've just said, we don't really want!)

Mice and keyboards:

These are almost all connected via USB nowadays (yes, even the wireless ones – they still need a little USB device plugged into the PC to act as transmitter/receiver so they can communicate with the PC.
Since the driver for the USB port isn't always included in BIOS, many motherboards still have one older-style PS/2 keyboard socket, so that a technician can use a PS/2 keyboard as a last resort to try to fix when things go wrong.

Visual Display Unit [VDU]:

I'll leave you to explore and research these – check out:

- VGA
- DVI
    - DVI-I
    - DVI-D
    - DVI-A
- HDMI
- DisplayPort

Pin connectors:

There will also be various small cables from pin connectors on the motherboard to various devices on the front of the PC case. These might include the reset button, an LED (usually green) to show the power is on, an LED (usually red) to show that the hard drive (or SSD) is being read or written to, a connector to a small loudspeaker in the case, for error beep codes at start-up and others.