

Al- Mustaqbal University
College of Science
Medical Physics Department
First Stage



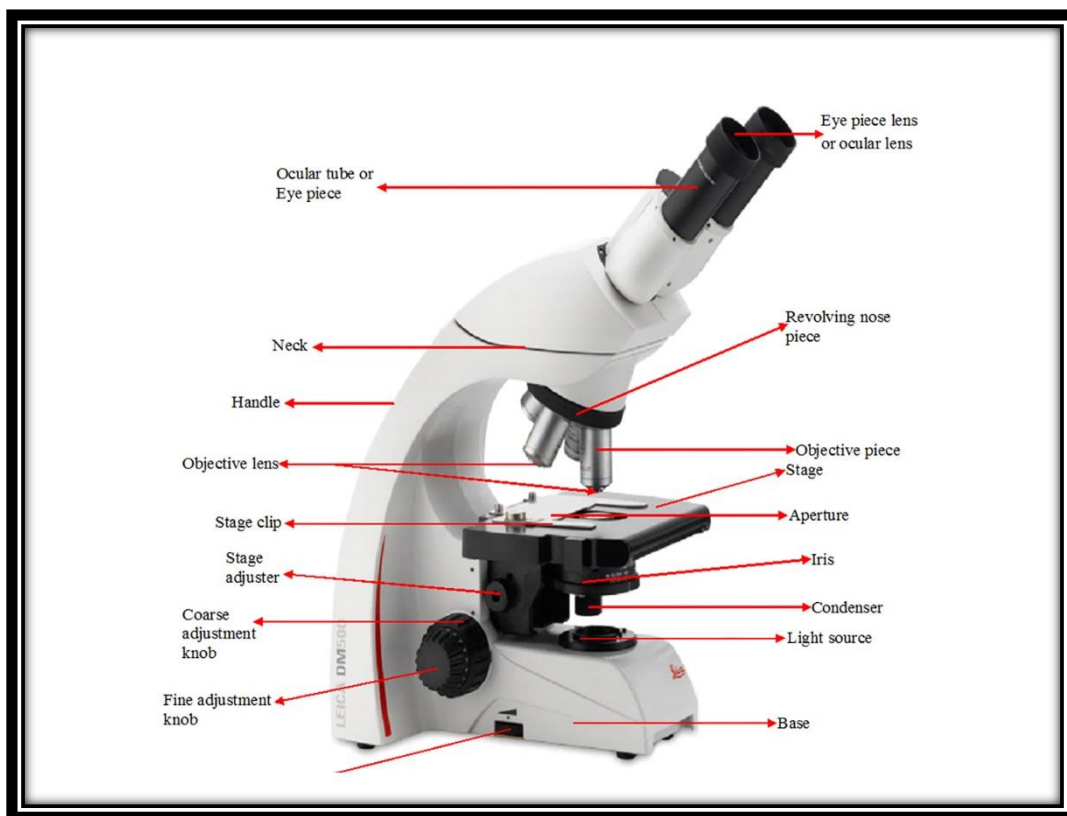
General biology

Lecture (Lab): 2 **laboratory of machines**

Lecturer: M.SC Summer Hussein
2025 – 2026

labarotary of machines**1- Microscopy**

is the technical field of using microscopes to view objects and areas of objects that cannot be seen with the naked eye (objects that are not within the resolution range of the normal eye). There are three well-known branches of microscopy: optical, electron, and scanning probe microscopy, along with the emerging field of X-ray microscopy.



Figure(1) Microscopy

2- Incubator

A laboratory incubator is pretty much the same thing. It is essentially a box that provides a particular kind of environment within it, maintaining certain atmospheric conditions like temperature, humidity and gaseous mix.

Some bacteria and other living stuff need that kind of precise atmosphere to grow; and you can put them in an incubator and set the climate inside accordingly to help their growth. Like most lab machines.



Figure(2) Incubator

3- Autoclave

An autoclave is not a lab machine that helps in doing experiments, but it is highly essential in any microbiology or medical labs . Cleaning and sterilization are probably the most important part of safety in biological works.



Figure(3) Autoclave

4- Centrifuge

A centrifuge machine is basically a slanted rotating platform that can hold some tube-like glassware (or plasticware) and spin them at a high velocity so that the liquid inside them presses down hard on the bottom of the tubes. Any particles suspended in the liquid – like red cells in the blood – fall down in the bottom while the clear solution gathers above.

That means whenever you want to separate particles from liquids (and don't want to wait a century to have them fall naturally), you'll want a centrifuge . They are available in various sizes – some can hold tiny milliliter-volume tubes only.



Figure(4) Centrifuge

5- Water Bath

A laboratory water bath can heat substances slowly and keep that temperature for a long time, as long as you keep the switch on. You can also use it to heat flammable substances that one just can't hold over a burner. They come in various capacities and capabilities such as circulating water baths or shaking water baths.



Figure(5) Water Bath

6- Hot Air Oven

You cannot put everything in an autoclave. For example, what about things made of paper or similar stuff that you can't get wet? Or maybe you want to sterilize some powder, or something that melts in water like a tablet? Or, what if the material is flammable? To sterilize such material, you have to use the dry heat as only a hot air oven can provide. It works just like an autoclave, except here you use heated air instead of steam. This has the added benefit of generating even more heat – like three hundred degrees! There is literally no living thing that will

survive that kind of heat for a sustained time. An autoclave heats up plain air in a heating chamber and circulates it in the chamber, assaulting any living organism and oxidizing them into inertness.



Figure(6) Hot Air Oven