



Research and Development Infrastructure

St. Thomas College Palai


“Creating ecosystem for the promotion of Innovation and Incubation”



Department of Zoology					
Sl. No	Instrument Photograph	Name of the Instrument	Faculty in Charge of the equipment	Technical purpose	Practical purpose or The way it can be useful to the Industry or a startup/entrepreneur
1.		Illuminated Binocular compound microscope	Mathew Thomas	Observation of microscopic specimens	Visualization and detailed examination of microscopic samples without external light source; routinely used for microbiological and biotechnological laboratory works.



2.		Microscopic digital camera	Mathew Thomas	Capture and display images of microscopic specimens	For documentation of research data
3.		BOD incubator	Dr. Jayesh Antony	Biological Oxygen Demand estimation	For testing the purity of water samples
4.		Laminar Air Flow	Dr. Jayesh Antony	Providing sterile condition for cell culture	Can be used for cell and tissue culture and derived products



5.		Rotary shaker	Mathew Thomas	For mixing compounds and solvents	Essential equipment for extraction of compounds from various samples
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Department of Physics

6.		X-ray diffractometer	Dr. Ginson P. Joseph	Structural analysis of materials	Structural characterization of materials
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7.		Thermogravimetric and differential thermal analyzer	Dr. Ginson P. Joseph	Thermal analysis of samples	Thermal studies of samples
8.		Nanomaterials synthesis workstation	Dr. Ison V. Vanchipurackal	Synthesis of nanomaterials	Synthesis of variety of nanomaterials in a safe environment. The materials can be used for the fabrication of optoelectronic devices including solar cells, lasers, LEDs, etc.

9.		Spin Coating unit	Dr. Ison V. Vanchipurackal	Growth of thin films for various applications	Controlled growth of thin film samples for variety applications.
10.		High temperature oven	Dr. Ison V. Vanchipurackal	Controlled heating of samples	Heating purposes of samples

11.		High temperature furnace	Dr. Ison V. Vanchipurackal	High temperature heating of samples	Crystallization of samples using annealing
12.		Centrifuge	Dr. Ison V. Vanchipurackal	Precipitation of samples	Purification of samples

Department of Botany

13.



Photomicrography




Taking
microscopic
photographs

14.



Rotary evaporator

Removal and
recovery of
solvents

15.		Tissue culture racks		Micro-propagation of plants	Tissue culture industry
16.		HPLC		Isolation of trace elements	Phytochemistry
17.		BOD Growth chamber		Tissue culture	Tissue culture industry

18.		Deep freezer		Maintaining DNA and Protein at very low temperature	DNA isolation
19.		Gel Documentation		Interpret Gel electrophoresis	DNA isolation

Department of Vocational Education

20.



Laboratory Oven

Laboratory ovens are ovens for high-forced volume thermal convection applications

It can be useful to researchers for annealing, die-bond curing, drying, Polyimide baking, sterilizing, and other industrial laboratory functions.




21.





Laminar Air Flow




Tissue culture





A laminar flow cabinet used in a tissue culture lab to prevent contamination of semiconductor wafers, biological samples, or any particle sensitive materials





22.		Incubator		Maintain microbiological cultures or Cells	In the medical, pharmaceutical, and other cell culture researchers
23.		Autoclave		Sterilization of various medial and cultures.	These are widely used in hospitals, Operation Theater (OT), microbiology laboratory
24.		Water Bath		To heat samples in the lab	Microbiology researchers are using this instrument for Maintaining cell lines or heating flammable chemicals that might combust if exposed to open flame

25.	 A digital microscope with a black body and a white base. The base has the text 'CXL mono' printed on it. It features a large objective lens at the top and a camera lens on the side. The microscope is mounted on a wooden surface.	Digital Microscope		Observing Specimen	Research, medicine, forensics
28.	 A stainless steel OTG (Oven Toaster Griller) oven. It has a glass door with a silver handle and control knobs on the right side. The oven is sitting on a dark surface.	OTG Oven		Food Processing	New food product development




Department of Chemistry

29.		Infrared Spectrometer	Dr. Sajeew Martin George & Dr. Thomas V Mathew	Infrared spectrum of a sample	To study and identify chemical substances or functional groups in solid, liquid, or gaseous forms.
30.		UV-Visible Spectrophotometer.	Dr. Sajeew Martin George & Dr. Thomas V Mathew	UV-Visible spectrum of a sample	Used in analytical chemistry for the quantitative determination of different analytes, such as transition metal ions, highly conjugated organic compounds, and biological macromolecules.
31.		Vacuum Rotary Evaporator	Dr. Sajeew Martin George & Dr. Thomas V Mathew	A kind of evaporation instrument	Used in chemical laboratories for the efficient and gentle removal of solvents from samples by evaporation.

32.		Muffle Furnace	Dr. Sajeew Martin George & Dr. Thomas V Mathew	For high-temperature applications	Used to heat a material to significantly high temperatures while keeping it contained and fully isolated from external contaminants, chemicals or substances.
33.		Vacuum Oven	Dr. Sajeew Martin George & Dr. Thomas V Mathew	To remove moisture, gas, and other possibly volatile chemicals	Used for delicate drying processes, such as drying tiny parts or removing flammable solvents.
34.		Conductometer	Dr. Sajeew Martin George & Dr. Thomas V Mathew	To measure the electrical conductivity in a solution	Used for finding the end point accurately and errors are minimized as the end point is being determined graphically.
35.		Potentiometer	Dr. Sajeew Martin George & Dr. Thomas V Mathew	To measure the EMF	To study the EMF (electromotive force) of a given cell, the internal resistance of a cell and also it is used to compare the EMFs of different cells.




36.		pH Meter	Dr. Sajeew Martin George & Dr. Thomas V Mathew	To measure hydrogen-ion activity	An electric device used to measure hydrogen-ion activity (acidity or alkalinity) in solution.
37.		Polarimeter	Dr. Sajeew Martin George & Dr. Thomas V Mathew	To measure the angle of rotation	Used to measure the angle of rotation caused by passing polarized light through an optically active substance.
38.		Melting point Apparatus	Dr. Sajeew Martin George & Dr. Thomas V Mathew	To measure the melting point	Used to determine the identity of the compound based on what temperature it turns from a solid to a liquid.
39.		Colorimeter	Dr. Sajeew Martin George & Dr. Thomas V Mathew	To measure the transmittance and absorbance of light passing through a liquid sample.	Used to measure the absorbance of wavelengths of light at a particular frequency (color) by a sample.




Department of Biotechnology

40.		Gel Doc	HOD	DNA visualization	DNA Studies
41.		PCR	HOD	DNA amplification	Various DNA based analysis
42.		CO2 incubator	HOD	Cell Culture	Cell line studies

43.		UV spectrophotometer	HOD	DNA, Protein Analysis	Molecular Studies
44.		Phase contrast microscope	HOD	Live Cell visualization	Bacteriological studies
45.		Autoclave	HOD	Sterilization	For media preparations

Department of Biochemistry

47.		Laminar air flow– Horizontal	Dr. Ratheesh M	Mainly used for maintaining sterilize working environment i.e., to prevent contaminations of biological samples or any particle sensitive materials.	It mainly used in life science research, microbiology, IVF, IUI and histopathology / pathology lab, plant tissue and animal cell culture and pharmaceutical industry
48.		Deep freezer (-20)	Dr. Ratheesh M	Used for storage of temperature sensitive biological samples (tissue, serum, cell supernants, lyophilised cultures), chemicals and assay kits.	Storage of biological samples, vaccines, serums, medical specimens at sub-zero temperatures. These chambers are ideal for long term storage & manufactured as per GMP norms.
49.		Hot air oven	Dr. Ratheesh M	Used to sterile the equipments such as glassware's and other materials that are used for microbial studies.	In industries like biotech, pharmaceutical and manufacturing units, it is used for curing, annealing, drying and sterilization. Also, it used as pretreatment of the sample before testing for tension, compression, deformation, deflection etc

50.		Water bath (30 ⁰ c-110 ⁰ c)	Dr. Ratheesh M	Incubation of samples in water at constant temperature	<p>Heating baths may be used in molecular biology and biology laboratories for the following:</p> <ol style="list-style-type: none"> 1. To carry out reactions at a specific temperature, often around 30-40°C, to mimic mammalian's internal temperature conditions for optimum enzyme activity. 2. To warm-up media and parenteral solutions before injections
51.		Bench top centrifuge	Dr. Ratheesh M	Used for separate or concentrate substance suspended in a liquid medium by density.	Bench top centrifuges offer versatility and convenience, and can be equipped many ways to support tissue culture, DNA/RNA research, cell harvesting, subcellular separations, and many other applications.
52.		Double distillation unit <i>(funded by Glowderma Pvt. ltd. Mumbai)</i>	Dr. Ratheesh M	Distiller for producing distilled water for laboratory research.	Industry and laboratory grade sterile double distilled water can be produced