



RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Research Facilities



**RAMAIAH
UNIVERSITY**
OF APPLIED SCIENCES

Research Facilities at RUAS

By

Research Division

Research @ RUAS

Ramaiah University of Applied Sciences (RUAS) vision is to be a premier Research and Innovation University of International Stature in the coming decade with the proven Global educational practices. We believe that ***“Research is Neither a First Step nor a Last Step but it is only a Next Step”***. The University has a well-defined Research Promotion Policy since its inception. Recently, the Research Promotion Policy was revised and approved by Board of Governors (BoG) on 31 Mar. 2021. The Faculty Members are intensely involved in updating the Research Facilities in various innovative disciplines. RUAS has the following categories of Research Facilities:

1. Central Instrumentation Facility
2. Animal House
3. Media Laboratory/Studios
4. Business Lab
5. Museum

Central Instrumentation Facility is predominantly utilized for carrying out high-end research work by the Faculty Members and the Students. Currently, the equipment is being added through the Grants obtained from funding agencies. The Department of Pharmacology, Faculty of Pharmacy is a CPCSEA approved unit and licensed for breeding and conduct of animal experiments (CPCSEA Registration No: 220/PO/ReBi/S/2000/CPCSEA/02.05.2016). The Animal House support experiments on small laboratory animals like guinea-pigs, rabbits, rats and mice. The Media Laboratory and Studios are envisaged to create e-contents across all Faculties/Schools and Departments of the University. This has led to the preparation of more than 4,000 e-resources in the form of Learning Management System (LMS) and videos on Laboratory Demonstration. In particular, the Media Laboratory and Studios have expertise in Videography, Photography, Audiography, Model Making and Prototype Development. The Mission of Business Lab is to facilitate data-driven decision-making and Management research for Business and Commerce Students in particular and University Students as a whole. The Faculty of Dental Sciences of RUAS has set up an Oral Pathology Museum which is a combination of both Art and Science by showcasing Oral Specimens for the benefit of student community.

RUAS has created research facilities to imbibe intellectual culture among all the stakeholders within the University ecosystem. In particular, the University consists of state-of-art facilities for research, training as well as teaching purposes. However, the utilization of equipment and testing facilities are cross-disciplinary where all Faculty Members and Students of RUAS are eligible to carry out research. Moreover, the equipment can be extended to outside researchers/industries on a chargeable basis.

Research Facilities at RUAS

Scanning Electron Microscope with EDX Facility



- The SEM is a COXEMI (EM-30) table top model (South Korea)
- SEM with EDX facility
- The SEM has magnification up to 1,00,000x
- Spatial Resolution < 5nm at 30 kV
- Acceleration voltage for SEM is 1-30 kV
- Samples size up to 70 mm (W) x 45 mm (H) can be used for detection with SED (DP) as the detector
- The X-Y/T Transverse movement is 35x35 mm/0-45°

Coordinate Measuring Machine

- Mitutoyo
- Bridge Type
- X axis 500 mm, Y axis 400 mm, Z axis 300 mm
- Maximum measuring speed 8 mm/s
- Resolution 0.0005 mm
- Maximum measurable height 545 mm
- Maximum table loading 180 kg



Low Speed Wind Tunnel



- Wind tunnel type- Suction
- Test section size- 0.6 m × 0.6 m × 2.0 m
- Fan maximum speed- 900 rpm
- Maximum air flow velocity- 35 m/s

Supersonic Wind Tunnel

- Wind tunnel type: Blow down
- Test section size: 50 mm × 50 mm
- Test Mach number: 3.6
- Test time: 30 sec
- Air storage tank volume: 5 m³
- Maximum air storage tank pressure: 12 bar
- Schlieren flow visualization



CNC Vertical Machining Center Model Winner



- Brand Ace Micromatic
- Table Longitudinal Travel: 400 mm
- Rapid Traverse :32 / 32 / 32 40 / 40 / 40
- Feed Rate :1 - 10000 mm / min
- Tool Storage Capacity: 12 Nos.
- Max Tool Dia with All pockets Full :125 mm
- Table Cross Travel:350 mm
- Headstock travel :320 mm
- Spindle Nose Face to Table Top :135-455
- Table Height from Floor :830 mm
- Table size :650 x 350 mm
- Max load on Table Standard :200 / 400 kgf
- Spindle Speed: 60 - 6000 rpm
- Spindle power Std: 5.5 / 3.7 kW

Slant Bed CNC lathe "Jobber XL"

- Swing Over Carriage - 260 mm
- Distance Between Centres – 425 mm
- Maximum Turning Length - 400 mm
- Spindle Size - A2-5, Bore through Spindle - 53 mm, Spindle Speed - 4000 rpm, Spindle Motor Power (Cont / 15 min) - 5.5/7.5 kW
- X-Axis stroke - 165 mm, Z-Axis stroke - 400 mm, X & Z axes rapid - 20 m/min
- No of Tools – 8
- OD Turning tool size - 25 x 25



Cone Beam Computer Tomography



- Sectional: 5x5 FOV, 1144 MGy/cm²
- Maxilla/ Mandible: 10x5 FOV, 612 MGy/cm²
- Full mouth: 10x10 FOV, 1070 MGy/cm²
- Full Skull: 17x 13.5 FOV, 2497 MGy/cm²
- A Panoramic image can be constructed from a CBCT full mouth or full skull scan
- Carestream CS 9300 has a true Panoramic imaging and Cephalometric capabilities that allows us to take the required scans as desired

Thermal Conductivity Analyzer

- Conforms to ASTM D7984
- Thermal Conductivity Range: 0.03 to 10 W/m.K;
- Temperature Range: Room Temperature to 250 °C
- Modified Transient Plane Source (MTPS)
- The MTPS method employs a single-sided sensor to directly measure thermal conductivity and effusivity of materials. The MTPS method has the highest precision, highest sensitivity, shortest test time, and is the easiest to use among all three techniques.
- Solids/Polymers/Composites, Pastes, Liquids and Nano fluids can be measured



Electrophoresis Unit, Submarine

- Midi submarine gel unit has a compact tank reduces the buffer volume required to cover the gel
- The UV-transparent running tray allows the user to image the gel without risk of damage due to handling
- The unit includes buffer chamber, safety lid with cables, UV transparent tray and one each 1.5 mm thick 15 and 20 well comb.



Vertical Electrophoresis Unit

- Cleaver Scientific provides the omniPAGE range comprises three sizes of gel chamber, Mini 10 x 10cm, Mini Wide 20 x 10cm and WAVE Maxi 20 x 20cm
- Each system have a guaranteed leak proof seal resulting in trouble free and rapid gel casting
- These systems are ideal for running precast or hand cast poly-acrylamide gels for SDS-PAGE or Native PAGE
- Each gel tank system includes a leak free casting option to cast your own polyacrylamide gels and the omniPAGE mini can utilize a wide variety of commercially available precast gels from all major manufacturers



Minus 80 Freezer



- Thermo Scientific -80°C lab freezers are designed to protect samples
- They're also designed to maximize storage capacity by offering a range of upright and chest models to accommodate a variety of laboratory footprint requirements
- Additional features include energy-savings models that meet today's sustainability demands
- Protect samples with the right, energy-efficient ultra-low temperature freezers
- Choose from our TSX, Standard Performance (STP) or Performance platforms

Thermal Cycler

- Single Aluminium alloy block of 32 wells compatible for 0.2ml PCR tubes & strips
- Gradient set up feature is available. Gradient temperature is from range 30- 100°C
- 5" TFT color touch – screen with graphical display provides easy use for setting up and monitoring
- Automatic restart after power failure
- USB drive available for transfer of data and software updating
- Heating Rate : 5°C/sec ; Cooling rate : 4°C/sec
- Control Accuracy : $\pm 0.2^\circ\text{C}$ (30 - 99.9°C)
- Wifi enabled



MINI Electrophoresis Units



- The Mini Gel Tank is a vertical mini-gel electrophoresis system with a unique tank design that has convenient side-by-side gel loading and enhanced viewing during use
- The tank can accommodate up to two gels per run with each gel run in its own separate chamber, making it easy to run just one gel and enabling the use of just enough buffer for one gel
- The tank is compatible with all Invitrogen pre-cast mini gels and SureCast handcast gels
- The Mini Gel Tank can be used for wet tank transfers using the Mini Blot Module
- Two Mini Blot Modules fit into the Mini Gel Tank to allow transfer of two gels at a time. The unique design of the blot module allows for the use of less transfer buffer (only 220 mL per gel)
- This lower buffer requirement keeps the amount of methanol needed to a minimum.

Microtitre Plate Reader

- The modular and upgradeable Thermo Scientific Varioskan LUX multimode reader offers up to five measurement technologies, including Absorbance, Fluorescence Intensity, Luminescence, AlphaScreen, QuantiGene SinglePlex, and Time-Resolved Fluorescence
- It offers features to help you save time and reduce common errors in the lab—including automated dynamic range selection, which adjusts the optimal reading range based on signal intensities, and built-in safety controls



Biosafety Cabinet Class II - Type A2



- Perform daily applications safely and efficiently with simple-to-order Thermo Scientific™ 1300 Series Class II, Type A2 Biological Safety Cabinet Packages
- Package includes cabinet; manual, adjustable height stand; factory-installed UV light; and one set of armrests
- These safety cabinets deliver exceptional design and technology advancements such as: superior protection with proprietary airflow design, exceptional ergonomics for a safe and comfortable environment, and outstanding energy efficiency for operational cost savings

CO₂ Incubator

- The Thermo Scientific CO₂ incubators offer multiple large capacity solutions for higher volume and throughput scale up applications
- The Heracell VIOS 250i CO₂ incubators provide a premium clean room compatible solution where cultures can grow in a controlled, protected environment
- Optional variable oxygen control allows for precise control of the culture environment which is critical particularly with more sensitive cells
- ISO Class 5 HEPA filtration for airborne contamination protection as well as proven, overnight 180°C sterilization cycle keep the environment protected against contamination



Cryopreservation Unit



- Store cells, tissues and biologicals in an economical and biological manner with Thermo Scientific™ Bio-Cane™ Cane and Canister Systems
- Available in four sizes, the system can safely hold samples for up to seven months without replenishing LN₂

Inverted Phase Contrast Microscope

- Cell culture analytics, In Vitro Fertilization (IVF) work, and imaging fluorescence stains are made easy with the TCM 400 and a host of accessories that make the modular system a researchers favorite tool
- High-performance optics configured and a durable, compact footprint make the TCM 400 ideal for modern workstations



Horizontal Laminar Air Flow Cabinet



- Laminar air flow cabinets (also known as laminar clean bench, laminar flow hood, laminar air flow bench) provide an aseptic space to work with a product or specimen, without contaminating it with particulates such as microorganisms
- Air is drawn through a HEPA filter in the laminar flow equipment and blown in a smooth laminar flow towards the user
- Hence the name, laminar flow hood (laminar clean bench, laminar air flow chamber, laminar hood etc)
- For user protection, where chemically hazardous or infectious materials are going to be used in the laminar flow equipment, a biological safety cabinet is required.

Spectrophotometer

- Micro controller based, standalone unit
- 20 X 4 alphanumeric LCD display
- Automatic source optimisation
- 200 – 1100 nm range
- 1nm bandwidth
- %T, ABS, CONC measuring modes
- Single / Multi wavelength and Spectrum / Time Scan operating modes
- Data processing (Stand – alone) Peak – pick, 1st derivative
- Date processing (through optional PC) Peak-pick, Point-pick, Expansion / Overlaying / Averaging / Subtraction / 1st to 4th derivatives of spectra, besides storage and retrieval of data
- Automatic 5- position sample changer. 500 µl sample in 1ml cuvette and 2 ml in 4 ml cuvette



Sigma Vertical Laminar Air Flow Cabinet



- A laminar air flow (LAF) cabinet, also known as a laminar Hood or tissue culture hood, is an enclosed cabinet designed for preventing contamination of biological samples, semiconductor wafers and sensitive materials
- It provides an excellent clean air environment, which is free from contaminant for performing a number of laboratory requirements
- Clean benches are other names of laminar air flow cabinets as the working air environment remains clear due to the high-end filtration process
- Laminar air flow cabinet maintains a unidirectional flow of HEPA-filtered air over the work area and protects the working environment from dust and other air-borne particulates
- Laminar air flow or laminar Hood consists of stainless Steel Cabinet, Filter pad or pre-filter, HEPA Filter, Fan or blower, UV Lamp, Working stations Fluorescent lamp etc.

Binocular Microscope

- Coaxial coarse and fine focus knobs: Tension adjustment on the right side and fine focus knob graduated, stage movement (XY direction) on rack and pinion
- Quadruple revolving nose piece (fixed), plane stage of 120x132 millimeters
- With right hand mechanical stage, Abbe condenser 1.25 (oil immersion) with aperture iris diaphragm and blue filter
- Universal power supply (100V to 240V) for 6V 20W illuminator, 8cc immersion oil, dust cover and mirror unit (plano-concave)
- Binocular observation tube (inclination 45 degree interpupillary distance adjustment range, observation 53-75 millimeters), diopter adjustment on the left



Stereozoom Microscope

- Strong metallic body - powder coated with epoxy protection
- German imported optics & L.E.D light in microscope
- Hi- Definition clarity
- Hassle Free focus
- 2 objectives, 2 lenses
- Free Slides packet
- Microscope cover and thermocol box packing



Olympus CX23 Binocular Microscope

- The Olympus CX23 system provides easy and safe operation throughout the workflow and ensures outstanding optical performance with large field number (FN) 20
- The built-in LED light source provides uniform and stable illumination for long term with low power consumption, and its reduced blue color preserves vivid colors of the sample
- CX23 microscope's unique features accommodate the student and every requirement in the educational setting



Sigma High Pressure Triple Walled Vertical Autoclave

- Vertical autoclave, also known as steam sterilizers and top loading sterilizers, is a sterilizing machine that comes in a cylindrical shape
- These machines help in sterilization of medical equipment, surgical instruments to name a few
- Sterilization is one of the key medical processes in many industries including food and healthcare
- This machine works on the principle of high-pressure steam for sterilizing flasks, medical tools, beakers, etc.
- These are ISO and CE Certified with chamber volumes of 22 liters to 175 liters that accommodate two and three drums accordingly
- These systems are designed for meeting effective sterilization requirements in bacteriological and research laboratories, hospitals and clinics and food and beverage units
- The vertical chamber design maximizes space utilization, while microprocessor control system enables comfortable working all the time you operate the machine



BOD (Biological Oxygen Demand) Incubator



- Double walled modular structure with 80mm thick PUF insulation
- Inside Stainless Steel and Outside Mild Steel Powder Coated OR Stainless Steel
- Observation glass door for quick view and help to avoid temperature variation.
- Heavy-duty latches, door handle with lock & door hinges to maintain a secure and uniform seal
- Racks & trays – Stainless Steel with adjustable height.
- CFC Free R 134 A / R 404 (Eco Friendly) refrigeration system
- Control system (PLC or Microprocessor) with touch screen display 4" HMI with Ethernet
- Temperature overshoot and undershoot of temperature giving audio visual alarm
- Documentation with DQ, IQ, OQ & PQ protocol, Operations and well explained user manuals etc.

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Sorvall ST4 Plus Centrifuge

- This device is used for the separation of fluids, gas or liquid, based on density
- Separation is achieved by spinning a vessel containing material at high speed; the centrifugal force pushes heavier materials to the outside of the vessel
- It is used for research purposes and used to purify cells, sub-cellular organelles, viruses, proteins, and nucleic acids
- This device provides standard high contrast user interface for up to 6 saved programs with simple push-button operation for routine applications. With capacity up to 4L, including 196 blood tubes and 96 15mL conical tubes, AutoLock for fast rotor exchange and 13 available rotors
- Intuitive controls simplify operation and provide detailed information on a wide range of operating parameters and processing status for optimal performance.



Microprocessor Colony Counter

- The instrument uses the latest microprocessor technology and advanced engineering techniques so as to give enhanced accuracy and reproducibility
- The system has 6 soft touch membrane type keys for ease of operation
- A built-in averaging facility allows the calculation of average colony counts using multiple dishes
- It has the storage facility for 100 result-counts which are retained in the memory even when the instrument is switched off
- Optimum viewing of colonies is aided by peripheral glare free illumination graticuled disc provided in the instrument
- The magnifier magnifies the colony area
- This is an indispensable tool for the microbiologist



Stereo Microscope



- A stereo microscope or dissecting microscope is an optical microscope with a fixed or adjustable magnification (zoom) objective and is designed for observation of samples at relative low magnifications from 2,5 to 90 times (max. 300 times)
- These microscopes consists out of two distinct optical systems providing 2 images, one image for each eye
- Subsequently, the human brain combines the two images to one 3-dimensional image with increased depth of focus
- These microscopes enable examining the specimen with high-performance precision and generate three-dimensional images allowing observation for the highest demanding microscopy applications
- These top-level zoom microscopes are perfect for analyzing all kinds of material surfaces or to observe and prepare biological samples
- These stereo microscopes are supplied with a large choice of stands, with or without LED illumination

Borosil Labquest Steam Distillation

- Borosilicate glass assembly along with SS steam generator for extended unit life
- Process kill switch to halt the process in case of accidental door opening
- Detachable bottom drip tray for extra protection against acidic attack during sample loading
- Anytime alkali addition during the distillation cycle Tube sensor that enables safe operating conditions in event of tube damage
- Reagent refill level sensor to avert reagent dry out
- The magnifier magnifies the colony area
- This is an indispensable tool for the microbiologist



-40o C Deep Freezer



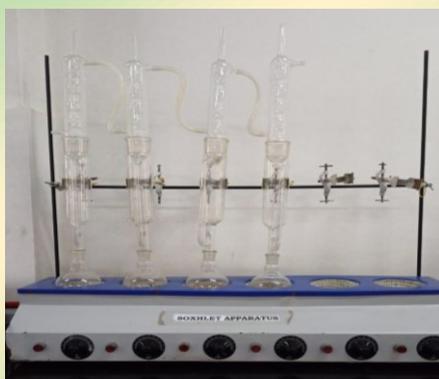
- Laboratory Deep freezers play important role in safe storage of reagents, frozen vaccines and other temperature sensitive specimens for research purposes that require freezing temperature up to -40 degree
- These freezers are ideal for routine storage of samples in the clinical, pharmaceutical and biomedical laboratories. It is CE and ISO certified and designed for deep freezing of temperature minus 40-degree temperature range
- These freezers are ergonomically designed to meet critical freezing storage requirements of life science laboratory, pharmacy and biomedical lab etc.
- These units are designed in either vertical (upright) or horizontal designs
- Each unit is fitted with digital temperature controller for easy temperature settings; other accessories that may include are temperature chart recorder, data logger, buzzer alarm and caster wheels etc.

Muffle Furnace

- A muffle furnace or muffle oven is a furnace in which the subject material is isolated from the fuel and all of the products of combustion, including gases and flying ash
- After the development of high-temperature heating elements and widespread electrification in developed countries, new muffle furnaces quickly moved to electric designs.



Soxhlet Apparatus



- It was originally designed for the extraction of a lipid from a solid material
- Typically, Soxhlet extraction is used when the desired compound has a limited solubility in a solvent, and the impurity is insoluble in that solvent
- It allows for unmonitored and unmanaged operation while efficiently recycling a small amount of solvent to dissolve a larger amount of material

Water Bath

- A water bath is laboratory equipment made from a container filled with heated water. It is used to incubate samples in water at a constant temperature over a long period of time
- It is also used to enable certain chemical reactions to occur at high temperature. Water baths are preferred heat sources for heating flammable chemicals, as their lack of open flame prevents ignition



Lab Fermentor (Capacity: 10L)



- Fermentation is a metabolic process that produces chemical changes in organic substrates through the action of enzymes
- In biochemistry, it is narrowly defined as the extraction of energy from carbohydrates in the absence of oxygen
- In food production, it may more broadly refer to any process in which the activity of microorganisms brings about a desirable change to a foodstuff or beverage
- Fermentor is sterilized using high pressure steam between batches. Strictly speaking, there is often addition of small quantities of chemicals to control the pH or suppress foaming

Hot Air Oven

- Hot air ovens are electrical devices which use dry heat to sterilize. They were originally developed by Pasteur
- Generally, they use a thermostat to control the temperature
- Their double walled insulation keeps the heat in and conserves energy, the inner layer being a poor conductor and outer layer being metallic
- There is also an air filled space in between to aid insulation. An air circulating fan helps in uniform distribution of the heat
- These are fitted with the adjustable wire mesh plated trays or aluminium trays and may have an on/off rocker switch, as well as indicators and controls for temperature and holding time



pH Meter



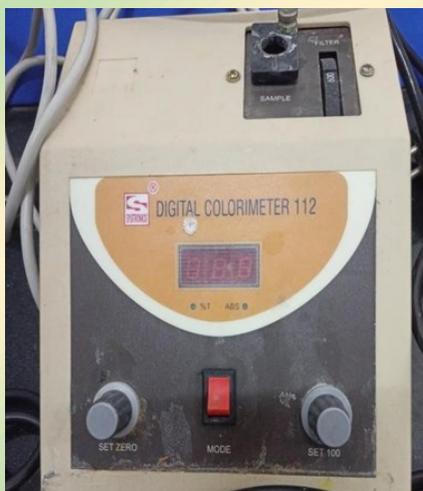
- A pH meter is a scientific instrument that measures the hydrogen-ion activity in water-based solutions, indicating its acidity or alkalinity expressed as pH
- The pH meter measures the difference in electrical potential between a pH electrode and a reference electrode, and so the pH meter is sometimes referred to as a "potentiometric pH meter"
- The difference in electrical potential relates to the acidity or pH of the solution
- The pH meter is used in many applications ranging from laboratory experimentation to quality control

Microscope

- A microscope is a laboratory instrument used to examine objects that are too small to be seen by the naked eye
- Microscopy is the science of investigating small objects and structures using a microscope
- Microscopic means being invisible to the eye unless aided by a microscope. The microscope often referred to as the light microscope, is a type of microscope that uses visible light and a system of lenses to magnify images of small subjects
- A simple microscope works on the principle that when a tiny object is placed within its focus, a virtual, erect and magnified image of the object is formed at the least distance of distinct vision from the eye held close to the lens



Digital Calorimeter



- A calorimeter is an object used for calorimetry, or the process of measuring the heat of chemical reactions or physical changes as well as heat capacity
- Differential scanning calorimeters, isothermal micro calorimeters, titration calorimeters and accelerated rate calorimeters are among the most common types
- A simple calorimeter just consists of a thermometer attached to a metal container full of water suspended above a combustion chamber
- It is one of the measurement devices used in the study of thermodynamics, chemistry, and biochemistry

Moisture Analyzer

- A moisture analyzer or moisture analyzer balance can be a portable or fixed moisture meter for moisture determination according to an established moisture measurement principle
- A halogen moisture analyzer balance uses the heat from the halogen lamp or halogen light bulb to dry a material sample



Animal House



- The Animal House support experiments on small laboratory animals like guinea-pigs, rabbits, rats and mice
- The Animal House has created Standard Operating Procedures (SOPs) to ensure quality and consistency in reviewing research proposals of PG Students/Ph.D. Scholars and Faculty Members
- The facility has obtained five sponsored research projects and contributed more than 150 publications
- Young Faculty Members are benefitted with first-hand experience to conduct animal experiments with all safety precautions and can propagate research culture within the Faculty and University as a whole

Business Lab

- The Mission of Business Lab is to facilitate data-driven decision-making and Management research for Business and Commerce Students in particular and University Students as a whole
- The learning cases may be pertaining to Resource Management, Optimization, Unlocking Gender Inequality, Closing the Skill Gap, Business Plan, Financial Modelling, Analytics
- The learning cases may be pertaining to Resource Management, Optimization, Unlocking Gender Inequality, Closing The Skill Gap, Business Plan, Financial Modelling, Analytics
- Students develop a great potential and capability for Research, Learning and Innovation through experiential learning using technology



Media Laboratory and Studios



- The Photography Studio enables students to learn the basics of product photography to capture images utilizing both natural and artificial light
- Students are taught the techniques and strategies for integrating principles of composition and design into their images and working with the principles associated with light and optics
- The studio consists of multiple working tables, backdrops, cameras, lighting fixtures, light boxes, diffusers, tethers, props and assorted stationary for students use in the lab

Product Ergonomic Studio

- This ergonomics studio prepares students to create human centric design solutions through application of ergonomic factors
- The studio houses measuring tables, scientific anthropometric measurements instruments, anthropometric scales, books and various products ranging from hair dryers to automotive interiors
- Students are taught fundamentals of ergonomics, human body structure and function, posture, movement and biomechanics, physiological and psychological aspects



Print Making and Painting Studio



- Transferring finished works of art or illustration on to different materials such as fabric and paper is an important process in creating objects of commercial value. Techniques such as woodcut, etching, engraving, and screen-printing are taught to the students
- The quality of the outcome is closely monitored by the faculty and the students are given individual attention in helping them realise their designs
- The students are surrounded by beautiful murals and art works done by the students as soon as they enter the painting studio

Carpentry Studio

- Bench vise 24 no's – Particularly used for attach directly to a workbench to hold the work piece during operations such as sawing, planing, and drilling
- Carpentry tools – Used for planing and shaping
- Wood Lathing machine 2 no's – Used for wood turning



Foam Modeling Studio



- There is a fundamental difference in viewing the design concepts in a computer screen and experiencing it in real life
- The three dimensionality of form prototyping is required to receive touch and feel feedback which is very essential in understanding the form of a concept
- Forms can be built in different materials such as poly-urethane foam, thermocol, clay etc

Industrial Clay Studio

- The knowledge of handling different tools are used for different materials is imperative for creating quality outcome
- Handling tools such as clay tools, carving tools, wire cutting and moulding tools
- The Ceramic studio also houses state of the art pottery wheels and furnaces required for baking and glazing



Concept Studio



- Design students have to showcase their designs to gain adequate feedback from peers, faculties and experts and hence improve themselves in the process
- This studio houses the best projects done by the past and current students
- Any important guests visiting the universities tour this studio providing a scope of recognition and employment opportunities for the students

Pace Lab

- Any product designed with the intention of mass production, has to be tested for feasibility and manufacturability before it is ready for real life fabrication
- Product Design includes digital form generation and exploration, material selection and is used in creating realistic renders for which excellent computer resources are very much essential
- Students can model the products and create several iterations, apply material finish for realistic renditions of their imaginations by using software's such as CATIA, sketchbook pro, coral painter



Fashion Design Laboratories



- Evolutionary and innovations in the production of textiles, apparels and clothing has opened the gate way for intelligent fashion in the forth coming years
- Centre of Excellence for Garment Design, Garment Manufacturing and Quality Control was established in the department of Fashion Design, FAD by Handloom and Textiles Department
- Sewing Machine Manual - Floral Face Plate and Arm Side Cover, Lever Type Stitch Regulator for Forward and Reverse Stitch Control, Auto Tripping Spring Loaded Bobbin Winder for Uniform Winding of Bobbin, Sheet Metal Bobbin Winder

Textile Processing and Quality Testing Lab

- Textile testing is a key in gauging product quality, ensuring regulatory compliance and assessing the performance of textile materials
- It is a vital basic tool during the processing of a textile raw material into the product
- Textile testing refers to the procedures adopted to determine quality throughout the textile product chain and the application of engineering facts and science to determine the quality and properties of a textile product



Rotary Vacuum Evaporator



- A rotary evaporator is a device used in chemical laboratories for the efficient and gentle removal of solvents from samples by evaporation
- Vacuum evaporators as a class function because lowering the pressure above a bulk liquid lowers the boiling points of the component liquids in it

Probe Sonicator

- This LABMAN equipment is an ultrasonic probe sonicator in which ultrasonic energy is produced by converting the electrical energy into mechanical vibrations
- This probe sonicator is an ideal instrument to accelerate the chemical and or physico chemical reactions, for the purpose of liquid degassing and also for sample cleaning i.e., to removes all dirt & foreign bodies from components which are immersed in the cleaning liquid



Rubber Rolls Sheller



- The rubber roll sheller SH A is used in rice processing plants if the paddy rice is to be shelled carefully at high capacities
- For an optimum shelling process, the circumferential and differential speeds of the rubber rolls can be adapted to different rice varieties
- While the paddy is transported through the gap between the rubber rolls, the rolls are cooled by a fan

Freeze Drier



- Freeze drying is the removal of ice or other frozen solvents from a material through the process of sublimation and the removal of bound water molecules through the process of desorption
- Excellent method for preserving a wide variety of heat-sensitive materials such as proteins, microbes, pharmaceuticals, tissues & plasma

Continuous Band Sealer



- Continuous Band Sealer Machine capable of sealing a wide range of bags such as stand-up pouches (Doypack), gusseted bags, pillow-type bags, sachets, barriers bags
- Typical products being packaged with these units include Aggregates, Coffee, Chemicals, Spices, Soaps, Sauces, Snacks, Cookies, Chocolates, Cereals, Dyes, Grains, MREs, Pastas, Pet Food, Pastries, Flours, Parts, Tortillas, Vegetables, and many other products

Environmental Chamber

- An environmental test chamber artificially replicates conditions which machinery, materials, devices or components might be exposed to
- It is also used to accelerate the effects of exposure to the environment, sometimes at conditions not actually expected
- Thermal Shock testing is used to simulate how materials will react when exposed to changes in extreme climatic conditions, such as going from extremely cold to extremely hot conditions in a very short period of time (usually only few seconds)



Digital bursting strength tester

- The force required for bursting or complete rupture of the board is measured through digital indicator
- The bursting strength defines the material quality as compared to others
- The digital bursting strength tester provides hydraulic load under rubber diaphragm of a specific area of the sample under test



Sieve Shaker



- Sieve shakers are used for separation and size determination of particles
- A typical sieve shaker separates particles by passing them through a series of chambers with mesh filters and agitating the sample in order to obtain complete separation
- Choice of equipment will depend on the type of lab and the samples being processed

Cup and bottle sealer – Hitech Pack

- These advanced cap sealer machines are used for capping bottles and vials
- These capping machines are suitable for a wide range of applications because it is capable to handle bottles and vials of different shapes, sizes and materials



Gerber Centrifuge



- It is used for separating particles from a solution according to their size, shape, density, viscosity and rotor speed
- the particles are usually cells, subcellular organelles, viruses, large molecules such as proteins and nucleic acids
- It works on the basic Theory of Sedimentation

Vacuum packing machine – Hitech Pack

- Vacuum packing is a method of packaging that removes air from the package prior to sealing
- This method involves (manually or automatically) placing items in a plastic film package, removing air from inside and sealing the package
- Shrink film is sometimes used to have a tight fit to the contents



Kalweka All Purpose Equipment



- Kalweka equipment is available with 11 attachments
- All-purpose Lab Model is used in pharma industry for Research & Development
- Comes with Horizontal Drive with different attachments
- Ideal for process optimization of pilot scale up manufacture of pharmaceuticals, food supplements and cosmetics product

Brookfield's Viscometer

- Used to measure product viscosity of various pharmaceutical formulations like solutions, suspensions and semisolid formulations like creams and ointments.
- Used in both controlled stress and controlled rate modes to characterize creep behaviour as well as yield stress and viscosity profiles



Cooling Centrifuge



- The centrifuge spins samples at a fast rate, resulting in heavy components to migrate away from the center axis and lighter components to migrate towards the axis. Centrifuge devices are widely used tools in food processing and medical research for cellular, genetic, biological and protein separation analysis
- Additionally provides the cooling mechanism to maintain the uniform temperature throughout the operation of the sample.

Disintegration Tester

- The primary purpose of disintegration tester is to measure the time taken for a tablet (sample) to totally disintegrate inside a liquid medium
- Disintegration tester allow researchers and quality control technicians to ascertain if a tablet does indeed breakdown inside the human body, and how long it takes to do so
- This can provide information useful to improving and manufacturing pharmaceutical drugs and also confirm that standards of compliance and regulation are being maintained



Dissolution Tester



- In the pharmaceutical industry, drug dissolution testing is routinely performed to provide critical in-vitro drug release information for both quality control purposes, i.e., to assess batch-to-batch consistency of solid oral dosage forms such as tablets and also during formulation development process to predict in-vivo drug release profile

Flame Photometer

- It is used in determination of potassium, sodium, magnesium and calcium in biological fluids like serum, plasma and urine
- Also used for analysis of industrial water, natural water for determining of elements responsible for hard water, soil samples etc.



FT-IR Spectrophotometer



- FTIR (Fourier Transform Infra-red Spectroscopy) is a precise method used for identifying organic chemicals in a wide range of applications
- It is also possible to identify some inorganic compounds. Paints, resins, adhesives, polymers, drugs and coatings are some of examples
- It could also be used for drug –excipient compatibility studies during formulation development

High Performance Liquid Chromatography

- HPLC is a chromatographic method that is used to separate a mixture of compounds in analytical chemistry and biochemistry so as to identify, quantify or purify the individual components of the mixture
- Extensively used in food and pharmaceutical industry



High Performance Thin Layer Chromatography



- HPTLC technique is widely employed in the pharmaceutical industry in process development, identification and detection of adulterants in herbal products and helps in the standardization of herbal drugs
- HPTLC is an advanced sophisticated form of TLC

Lite Image Microscope

- This microscope uses visible light to detect and magnify very small objects and enlarging them to obtain digital images of the same
- Useful in microbiological examination of the organism and histopathological studies
- It is used for powder analysis of crude drug samples
- Used in histopathology when dealing with tissues, or in smear tests on free cells or tissue fragments



Lyophilizer



- Lyophilization is regularly used to preserve vaccines, pharmaceuticals, and other proteins in dry form totally free from moisture / solvent
- Freeze-drying is also used to preserve special food products, eliminating the need for refrigeration

Multimill

- Multi mill is used for high speed Granulating, Pulverizing, Mixing, Shredding and Chopping, etc., of a wide range of wet and dry materials without special attachments
- This machine utilizes the principle of variable force swing hammer blades having both knife and impact edges rotating with a carefully selected screen to control size reduction



Pelletizer



- Pelletizer is especially useful for making dense granules for controlled-release solid oral dosage forms with a minimum amount of excipients
- Extensively used in food and pharmaceutical industry

Probe Sonicator

- Probe Sonicator is often used to disrupt cell membranes and release cellular contents
- It is used to fragment molecules of DNA
- It is extensively used in nanotechnology for evenly dispersing nanoparticles in liquids and for breaking down particles to nano size



Rotary Tablet Punching Machine



- The equipment is useful for making tablets. Can manufacture tablets for a wide variety of materials like pharmaceuticals, cleaning products, cosmetics
- Different shapes of tablets can be compressed using the powder / granules form of raw materials

Ultra Turrex Homogeniser

- It is used to create a uniform and consistent mixture
- It works by breaking the components and evenly distributing them throughout the solution
- Its yields are typically incorporated into critical products like vaccines, antibiotics, cancer treatment, and pharmaceutical creams



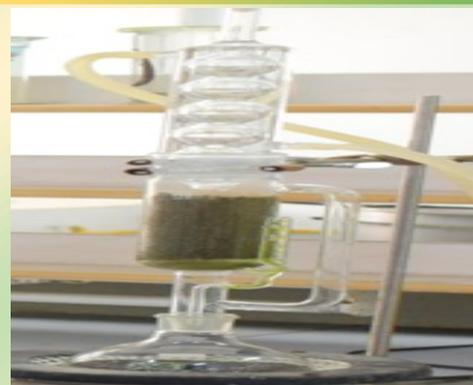
UV Spectrophotometer



- Light with a wavelength range between 190 nm and 800 nm is radiated through the cuvette using a spectrometer and absorption spectrums are recorded
- It is possible to use different broadband UV-Vis light sources
- It is used to estimate the drug concentration in various formulations

Soxhlet Apparatus

- It is the most useful apparatus for solid–liquid extraction in various fields such as pharmaceuticals, Herbal & also foodstuffs
- Nowadays, Soxhlet apparatus is still common and widely used as a reference and standard method in many laboratories for the extraction of oil from various materials



Rotational viscometer - LABMAN



- Viscosity is usually described as the property of a fluid which determines the rate at which local momentum differences are equilibrated
- Rotational viscosity is a property of a fluid which determines the rate at which local angular momentum differences are equilibrated
- If there is a lack of equilibrium between these degrees of freedom, then the rate of equilibration will be determined by the rotational viscosity coefficient

Deep fryer - GVP

- Deep fryers generally have a basket to lower the food into the oil tank and raise it when the food has finished cooking
- Fryer baskets purchased separately are not standardized and when selected, need to fit into the deep fryer



Vacuum Oven - Lawkim



- Vacuum drying is the mass transfer operation in which the moisture present in a substance, usually a wet solid, is removed by means of creating a vacuum
- In chemical processing industries like food processing, pharmacology, agriculture, and textiles, drying is an essential unit operation to remove moisture

Tray drying – ISOTECH Technology Pvt Ltd

- Tray dryer can be electrically heated, and Steam heated
- Tray Dryer comes in 6 trays, 12 trays, 24 trays, 48 trays, 96 trays and 192 trays
- The construction of the machine varies as per requirement of the customer, it can be inside outside MS or GMP model depending upon the product and industry requirement



Smart Dentin Grinder-Kometabio White

The below mentioned grinder was indented for Ph.D. study and after which it will be used in Oral Surgery department for socket preservation using autogenous graft material.

The specifications of the products is as follows:

1. Wattage 300-500W
2. Usage -Hospital
3. Operation mode: Electric and manual
4. Power source-Electricity
5. Portable
6. Phase-Single phase
7. Frequency-50Hz
8. Display -Digital

Other details: Uses extracted teeth to create superior quality, autogenous dentin graft, chairside within 15 minutes.

- Reduces healing time
- Maintains bone mass and ridge height which is necessary for rehabilitation
- Reduce cost
- No fear of graft rejection

It comes with the grinder which has a sieve and 12 autoclavable jars and reagents for graft preparation.

Cost: 60,000rs

- Conference presentation done using the Smart Dentine grinder for AIP conference, and published in AIP conference proceedings:
- Title: Assessment of inorganic and organic components in demineralized tooth graft material.
- Further to continue the usage of the apparatus in clinical study



Microwave Oven – BOSCH



- A microwave oven is an electric oven that heats and cooks food by exposing it to electromagnetic radiation in the microwave frequency range
- Microwave ovens heat foods quickly and efficiently because excitation is fairly uniform in the outer 25–38 mm

Microwave system

- Microwave-assisted extraction is an efficient method which involves deriving natural compounds from raw plants
- Microwave extraction allows organic compounds to be extracted more rapidly, with similar or better yield as compared to conventional extraction methods



Oral Pathology Museum



- Museum being a combination of both art and science requires skilled workmanship, meticulous planning and execution to exhibit a specimen to its optimal elegance due to its relatively smaller size and fragile nature
- A well-established Oral Pathology Museum is rarely seen due to negligence of Oral specimens, dearth of knowledge in this field and availability of data

3D Printer-Divide by Zero AION 500 MK2

RAMAIAH-GoK
TECHNOLOGY BUSINESS
INCUBATOR

Divide By Zero's
AION 500 MK2

- The revolutionary AION 500 MK2 is a high performance, IOT-enabled 3D printer that offers a professional-level build volume. Armed with patented AFPM (Advanced Fusion Plastic Modeling) technology, the printer renders a stronger and durable output.
- Offering a large build size, ultra-fast print speeds, minimal post processing, and unmatched precision, the AION 500 MK2 is designed for versatility.

PRINTER PERFORMANCE

Technology	patented AFPM technology
Effective Building Volume	500 x 500 x 500mm
Building Speed	300mm/sec
Layer Thickness in mm	Range1: 0.1-0.15 Range2: 0.15-0.25 Range3: 0.25-0.3
Model Materials	ABS, PLA, HIPS, PETG, Carbon fibre, AFPM, AFPM Carbon fibre, Nylon LPA, PCL, TPU

K-tech
INNOVATION
HUB

DIVIDE BY ZERO

Building Volume:

- 500mm*500mm*500mm

Layer Thickness in mm:

- Range1:0.1-0.15
- Range2:0.15-0.25
- Range3:0.25-0.3

Model Materials:

- ABS, PLA, HIPS, PETG
- Carbon Fiber, AFPM

Building Speed:

- 300mm/sec

Present Status:

- Operational

3D Printer-Divide by Zero AEQON 400V3

Building Volume:

- 400mm*300mm*300mm

Layer Thickness in mm:

- Range:0.1-0.25

Model Materials:

- ABS, PLA, HIPS, PETG
- Carbon Fiber, AFPM
- Metafil, Flexible filaments etc

Building Speed:

- 200mm/sec

Present Status:

- Operational

RAMAIAH-GoK TECHNOLOGY BUSINESS INCUBATOR

Divide By Zero's Aeqon 400V3

- India's first mid size single extruder 3D printer with a unique gantry design for easy 3D printing of mid size prototypes.
- Aeqon 400's low-noise operation, quick-load functionality, super-fast slicer and industrial-grade build quality ensure reliable print-cycles.

PRINTER PERFORMANCE

Technology	FDM Technology	Layer Thickness	0.1-0.25 mm
Effective Building Volume	400 x 300 x 300mm	Model Materials	PLA, ABS, HIPS, PET G, Polycarbonate, Wood fill, CARBON FIBRE, Metafil, Flexible Filaments, etc.
Building Speed	200mm/sec		

K-tech INNOVATION HUB **DIVIDE BY ZERO**

3D Printer-HP's Jet Fusion 580 Color 3D Printer

RAMAIAH-GoK TECHNOLOGY BUSINESS INCUBATOR

HP's Jet Fusion 580 Color 3D Printer

- Full spectrum color parts with voxel control
- Accurate, functional parts with intricate detail
- Accelerate design—create, test, iterate in hours

PRINTER PERFORMANCE

Technology	Multi Jet Fusion Technology	Layer Thickness	0.08 mm (0.003 inches)
Effective Building Volume	332 x 190 x 248 mm	Printhead Resolution	1200 dpi
Building Speed	2199 cm ³ /hr (134 in ³ /hr)		

K-tech INNOVATION HUB **hp**

Technology:

- Multi Jet Fusion Technology

Layer Thickness in mm:

- 0.08mm (0.03 inch)

Building Volume:

- 332mm*190mm*248mm

Print head Resolution:

- 1200dpi

Building Speed:

- 2,199cm³/hr

Present Status:

- Operational
- Will be commissioned in 1st Week of October

3D Scanner- Carl Zeiss's COMET LED 2

Sensor Head:

- COMET LED

Measuring Distance:

- 760mm

Camera Resolution:

- 2448*2050

Acquisition Time Preview:

- <1sec

Light Source:

- Blue LED

Present Status:

- Operational

RAMAIAH-GoK
TECHNOLOGY BUSINESS
INCUBATOR

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PRINTER PERFORMANCE

- Technology**
FDM Technology
- Layer Thickness**
0.1-0.25 mm
- Effective Building Volume**
400 x 300 x 300mm
- Model Materials**
PLA, ABS, HIPS, PET G,
Polycarbonate, Wood fill,
CARBON fibre, Metalfill,
Flexible Filaments, etc.
- Building Speed**
200mm/sec

K-tech
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RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Research Division

Ramaiah University of Applied Sciences

University House, Gnanagangothri Campus, New BEL Road,
M S R Nagar, Bangalore, Karnataka, INDIA - 560 054.

Tel. : +91 80 4536 6666 | Fax : +91 80 4536 6677

Email: dd.sr@msruas.ac.in Web: www.msruas.ac.in