**CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A), HYDERABAD - 500 075**

**LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP**

**Name of the Department**: **Civil Engineering**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | Environmental Engineering Lab (Smt. K. Manasa) | **List of Major Equipment / Facilities** |
| | | 1) Online Air Quality Monitor |
| | | 2) Muffle furnace |
| | | 3) Colorimeter |
| | | 4) BOD Incubator |
| | | 5) Combined Air Sampler |
| | | 6) COD reactor |
| | | 7) Hot Air Oven |
| | | **List of Experimental Setup in each Laboratory** |
| | | NIL |
| 2 | Solid Mechanics Lab (Sri T. Vasudeva Rao) | **List of Major Equipment / Facilities :** |
| | | 1) Mechanical Universal testing machine (UTM-100 T) |
| | | 2) Digital Universal Testing machine (UTM-1000 kN) |
| | | 3) Impact Testing machine |
| | | 4) Vickers hardness testing machine |
| | | 5) Brinell's hardness testing machine |
| | | 6) Rockwell hardness testing machine |
| | | **List of Experimental Setup :** |
| | | 1) Loading frame |
| | | 2) **Beams**: a) Simply supported; b) Cantilever; c) continuous and d) propped Cantilever |
| | | 3) Laminated spring |
| | | 4) Helical spring |
| 3 | Transportation Engineering (Sri G. Viswanath) | **List of Major Equipment / Facilities**: |
| | | 1) Ductility test |
| | | 2) Aggregate crushing value test |
| | | 3) Los Angeles abrasion test |
| | | 4) Marshall stability test equipment |
| | | 5) Dorry Abrasion Testing Machine |
| | | 6) California Bearing Ratio Test |
| | | 7) Benkelman Beam |
| | | **List of Experimental Setup in each Laboratory**: |
| | | 1) Penetration test |
| | | 2) Ductility test |
| | | 3) Softening point test |
| | | 4) Specific gravity test |

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| | | 5) Viscosity test |
| | | 6) Flash and fire point test |
| | | 7) Aggregate shape test (flakiness & elongation) |
| | | 8) Water Absorption test |
| 4 | **Fluid Mechanics, Hydraulics and Hydraulic Machines Laboratory (Sri. E Maheshwar Reddy)** | **List of Major Equipment / Facilities** |
| | | 1) Pelton Wheel Turbine |
| | | 2) Francis Turbine |
| | | 3) Kaplan Turbine |
| | | 4) Centrifugal Pump |
| | | 5) Reciprocating Pump |
| | | 6) Tilting flume |
| | | 7) Venturimeter and Orifice meter |
| | | 8) Mouth Piece and Orifice |
| | | 9) Notch Apparatus |
| | | 10) Impact of free jet |
| | | 11) Major Losses and Minor Losses in pipes |
| | | 12) Bernoulli's Principle Setup |
| | | **List of Experimental Setup in each Laboratory:** |
| | | 1) Mouth Piece Apparatus |
| | | 2) Orifice Apparatus |
| | | 3) Notch Apparatus |
| | | 4) Venturimeter and Orificemeter Apparatus |
| | | 5) Major Losses and Minor Losses Apparatus |
| | | 6) Major Losses and Minor Losses Apparatus |
| | | 7) Bernoulli's Theorem Apparatus |
| | | 8) Impact of free jet Apparatus |
| | | 9) Reynolds Experimental Apparatus |
| | | 10) Hemispherical tank |
| | | 11) Curved channel |
| | | 12) Venturiflume Apparatus |
| | | 13) Hydraulic Jump Apparatus |
| | | 14) Measurement of Viscosity Apparatus |
| | | 15) Stability of Floating Body Apparatus |
| | | 16) Hydrodynamic forces on Flat/Curved Surface |
| | | 17) Gear Pump |
| | | 18) Self-Priming Pump |
| | | 19) Pelton Wheel Turbine |
| | | 20) Francis Turbine |
| | | 21) Kaplan Turbine |
| | | 22) Centrifugal Pump |
| | | 23) Reciprocating Pump |
| | | 24) Tilting flume apparatus (Open Flow Channel) |
| 5 | **Surveying Lab (Sri. Ramanarayana Sankriti)** | **List of Major Equipment / Facilities:** |
| | | 1) Differential global positioning system (DGPS) / global positioning system |
| | | 2) Total station |
| | | 3) Theodolite |
| | | 4) Auto level |
| | | 5) Dumpy level |

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| | | 6) Plane table |
| | | **List of Experimental Setup in each Laboratory:** |
| | | 1) Ranging, running perpendicular lines and types of offsets by using chain, tape, cross staff. |
| | | 2) Prismatic compass for measuring the area of a given land by using compass traverse. |
| | | 3) Plane table survey - Radiation and intersection methods. |
| | | 4) Levelling - Fly levelling using Auto level. |
| | | 5) Development of L.S. and C.S after obtaining levels by using Auto levels. |
| | | 6) Developing contour maps. |
| | | 7) Measurement of horizontal angles using theodolite. |
| | | 8) Total station operations. |
| | | 9) Traversing by Total station. |
| | | 10) Setting of simple curve with the help of Total Station. |
| | | 11) Study of GPS operations. |
| | | 12) Establishing control points using GPS. |
| | | *13)* Demonstration of Remote Sensing Data processing software |
| **6** | **Concrete Laboratory (Dr. N.R. Dakshina Murthy)** | **List of Major Equipment / Facilities:** |
| | | 1) Vibrating Machine |
| | | 2) Pan / slab vibrator |
| | | 3) Proving ring |
| | | 4) Laboratory Concrete Mixture |
| | | 5) 3000 kN Digital Compression Testing machine |
| | | 6) Concrete Permeability Apparatus |
| | | 7) Ultrasonic Pulse Velocity Apparatus(UPV) |
| | | 8) Vibrating Table (2m) |
| | | 9) Concrete mixer, pan type. |
| | | 10) Hot Air oven. |
| | | 11) Resipod (sulphate resistivity meter) |
| | | 12) Digital R.C.P.T. 6 cell |
| | | 13) Core Cutting Machine. |
| | | 14) Accelerated Curing Tank. |
| | | 15) Concrete Permeability Test Apparatus |
| | | 16) Rebound hammer |
| | | 17) Shake table |
| | | **List of Experimental setup:** |
| | | 1) Specific gravity testing for cement / coarse aggregate/fine aggregate |
| | | 2) Compacting factor |
| | | 3) Test set-up for self compaction concrete |
| | | 4) Test set – up for impact testing of concrete |
| | | 5) Heat of hydration test for cement |
| | | 6) Compresso meter for stress/ strain for concrete |
| | | 7) Bulk density testing for coarse / fine aggregate |

| S. No. | Name of the Laboratory / Workshop | Details |
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| 7 | **Geo Technical Engg. Lab (Dr. Angshuman Das)** | **List of Major Equipment/Facilities:** |
| | | 1) Electromagnetic Sieve shaker |
| | | **2)** Universal automatic compactor |
| | | 3) Standard Penetration test (SPT) with accessories |
| | | 4) Permeability apparatus |
| | | 5) Relative density apparatus with complete accessories |
| | | 6) Plate load test apparatus |
| | | 7) 20 tonnes truss |
| | | 8) Hot Air oven (605x605x605) stainless steel |
| | | 9) Proctor Compaction apparatus |
| | | 10) Auger Outfit (Post Hole Type) with 50mm dia. and 75mm dia |
| | | 11) Direct shear apparatus |
| | | 12) Vane Shear apparatus |
| | | **List of Experimental Setup:** |
| | | 1) Core Cutter with hammers |
| | | 2) Liquid limit device with counter and one casagrande grooving tool |
| | | 3) Liquid limit cone penetrometer |
| | | 4) Sand pouring cylinder (HS:14.10) |
| | | 5) Shrinkage limit apparatus |
| | | 6) Proctor penetrometer |
| | | 7) Specific Gravity Bottels |
| | | 8) Pycnometer |
| 8 | **Engg. Geology Lab (Smt. Aswari Sultana Begum)** | **List of Major Equipment/Facilities:** |
| | | 1) Rock forming minerals |
| | | 2) Physical mineralogy |
| | | 3) Minerals of 50 Nos. showing habit minerals |
| | | 4) Showing luster & col |
| | | 5) Minerals speamenta |
| | | 6) Minerals specimens from Almirock |
| | | 7) Building stones |
| | | 8) Building ornamental |
| | | 9) Building ornamental stones |
| | | 10) Gems & Semi Gems |
| | | 11) Museum show specimens |
| | | 12) Gems & Semi Gems |
| | | 13) Metallic ovens set |
| | | 14) Rock specimens |
| | | 15) Rock specimens |
| | | 16) Rock specimens |
| | | 17) Structural Models |
| | | 18) Geological Charts |
| | | 19) Crystallography Models |
| | | 20) Crystal models of lock framing models |
| | | 21) Engineering models |
| | | 22) Digital DC Resistancy Meter with Accessories |
| | | 23) Geological Maps |

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| | | 24) Clinometers Compass |
| | | 25) Electronic weighing machine |
| | | 26) Hot plate |
| | | 27) Measuring Cylinder |
| | | **List of Experimental Setup in each Laboratory**: |
| | | 1) Rock forming minerals |
| | | 2) Physical mineralogy |
| | | 3) Minerals of 50 Nos. showing habit minerals |
| | | 4) Showing luster & col |
| | | 5) Minerals speamenta |
| | | 6) Minerals specimens from Almirock |
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| | | 23) Geological Maps |
| | | 24) Clinometers Compass |
| | | 25) Electronic weighing machine |
| | | 26) Hot plate |

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# HYDERABAD - 500 075

## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: Mechanical Engineering**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | RESEARCH LABORATORY | **List of Major Equipment / Facilities** |
| | | i) Nano UTM 25 KN, Lubrication & Friction Tester, Ultrasonic Flaw Detector, Image Analyzer S-W, |
| | | ii) DELL Precession Work Station |
| | | iv) Monocular metallurgical microscope model METZ 56 |
| | | v) Hydra 645 3D-Printer With MK450 Extruder |
| | | **List of Experimental setup** |
| | | Value added lab |
| 2 | ADDITIVE MANUFACTURING LAB | **List of Major Equipment / Facilities** |
| | | i) Raise 3D N2 Plus 3D Voume: 305 X 305 X 610 Printer, |
| | | ii) Raise 3D N2 Plus 3DPrinter Volume: 305 X 305 X 610 |
| | | iii) Next Engine HD 3D Scanner |
| | | iv) Flash Forge Inventor 3D Printers, Build Volume: 230 X 150 X 160 mm3 |
| | | v) Form Labs SLA Base 3D Printer. Build Volume: 145 X 145 X 175 mm3 |
| | | vi) Markforged Onyxpro 3D Printer. Build Volume: 320 X 132 X 154 mm3 |
| | | vii) G3D Plexi 3D printer, Vo.235x235x250, dual extruders |
| | | **List of Experimental Setup in each Laboratory** |
| | | Value added lab |
| 3 | APPLIED THERMO DYNAMICS LAB | **List of Major Equipment / Facilities** |
| | | i) TD 4/4 A Engine test rig with hydraulic dynamometer (Imported)(30 KW at 4000 RPM)(Tec Equipments,UK) |
| | | ii)VCR petrol Engine |
| | | iii) 4 Stroke Multicylinder petrol engine |
| | | iv) Bajaj 2 stroke petrol engine |
| | | v) Four stroke single cylinder diesel engine with electrical dynamometer |
| | | vi) Two -stage Reciprocating Air compressor |
| | | vii) Single cylinder four stroke with CRDI engine (Dual fuel mode) with CNG system and accessories |
| | | **List of Experimental Setup in each Laboratory** |
| | | 1. Valve timing diagram and Port diagram.<br>2. Performance characteristics of a multi-cylinder petrol engine.<br>3. Morse test on multi cylinder petrol engine.<br>4. Performance test on a variable compression ratio petrol engine.<br>5. Performance test on single cylinder diesel engine<br>6. Heat balance test on single cylinder diesel engine.<br>7. Volumetric efficiency, isothermal efficiency of multi -stage reciprocating air compressor. |
| 4 | CAD/CAM LAB | **List of Major Equipment / Facilities** |
| | | i) Vertical Machining Centre ( Denford,U.K), MASTER CAM 5.5<br>ii) V.M.C TRIAC, MTAB XL-TURN<br>iii) SOLID WORKS-18<br>iv) DIGIMAT ACADEMIC RESEARCH SOFTWARE |

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| | | **List of Experimental Setup in each Laboratory** |
| | | 1. Part modeling of various machine components<br>2. Format of drawing sheet, title block, Generating and editing drawings<br>3. 4 Assembly modeling of Stuffing Box<br>4. 5 Assembly modeling of Screw Jack<br>5. 6 Assembly modeling of Crosshead<br>6. Production drawing of components and indicating tolerances on size and geometrical form, Position; Indicate Surface finish, surface treatments if any and writing process sheet for anyone component<br>7. 8 Contouring on CNC Milling Machine.<br>8. Rectangular & Circular Pocketing on CNC Milling Machine<br>9. 10 Step Turning and Taper Turning on CNC Lathe Machine<br>10. Multiple Turning on CNC Lathe Machine<br>11. Design a product and Manufacture / generate CNC Machining tool path for its components |
| 5 | CENTRAL WORKSHOPS | **List of Major Equipment / Facilities** |
| | | i) Surface plate (Granite)1000 x 1000mm,<br>ii) Power saw machine, Mortising machine RPM 1440 HP3, Tenanting<br>iii) Sand testing equipment<br>iv) BOSCH tool kit<br>v) GI sheet cutting machine<br>vi) Stir Casting Machine |
| | | **List of Experimental Setup in each Laboratory**<br>**Carpentry**<br>1. plane the given wooden piece to required size<br>2. lap joint on the given wooden piece according to the given dimensions.<br>3. a dove tail-joint on the given wooden piece according to the given dimensions.<br>**Exercises in Tin Smithy**<br>1. make a rectangular box from the given sheet metal with base and top open. Solder the corners.<br>2. make a scoop.<br>3. make a pamphlet box.<br>**Exercises in Fitting**<br>1. make a perfect rectangular MS flat and to do parallel cuts using Hacksaw<br>2. make male and female fitting using MSflats-Assembly1<br>3. make male and female fitting using MSflats-Assembly2<br>Exercises in<br>**House Wiring**<br>1. Wiring of one light point controlled by one single pole switch, a three pin socket controlled by a single pole switch, and wiring of one buzzer controlled by a bell push |

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| | | 2. Wiring of two light points connected in series and controlled by single pole switch. Verify the above circuit with different bulbs. Wiring of two light points connected in parallel from two single pole switches and a three pin socket<br>3. Stair case wiring-wiring of one light point controlled from two different places independently using two 2- way switches<br>**Casting:**<br>1. Moulding sand testing: GCS, GSS, DCS and DSS<br>2. Moulding sand testing: Permeability and shatter index.<br>3. Finding out the GFN and Moisture content for a given sand sample.<br>4. Melting and Pouring of Aluminum. |
| 6 | DYNAMICS & VIBRATION LAB | **List of Major Equipment / Facilities**<br>i) Gyroscope,<br>ii) Governors, Cam profile, static and dynamic balancing, Whirling of shafts etc<br>iii) Universal Vibration Apparatus<br>iv) Impact Hammer<br>v) Handheld Shaker<br>vi) Smart Shaker<br>**List of Experimental Setup in each Laboratory**<br>1. Plot the follower displacement vs angle of rotation curves for different cam follower pairs.<br>2. Gyroscopic effect on a rotating disc.<br>3. Determination of the frequency of torsional vibrations.<br>4. Static and Dynamic balancing in a rotating mass system.<br>5. Effect of varying mass on the centre of sleeve in Porter governor.<br>6. Effect of varying the initial spring compression in Hartnell governor.<br>7. Undamped torsional vibrations of double rotor system.<br>8. Longitudinal vibrations of helical coiled spring.<br>9. Uundamped forced vibration of spring mass system.<br>10. Force damped vibration of spring mass system.<br>11. Critical speed of the given shaft with the given end conditions (Whirling of Shafts).<br>12. Frequency response of spring mass system with damping.<br>13. Eequivalent link parameters and centre of mass of connecting rod theoretically and validate the result by experiment by choosing suitable methods and devices. |
| 7 | ENGINEERING GRAPHICS LAB | **List of Major Equipment / Facilities**<br>i) HP Pro 3330 MT Desktop systems-138 Nos,<br>ii) 20 KVA Online UPS with 1/2 hour backup,<br>iii) 10KV online UPI Techsel Make |

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| | | **List of Experimental Setup in each Laboratory**<br>1.Introduction to CAD package: Settings, draw, modify tools, dimensioning and documentation<br>2. Construction of Conic Sections by General method<br>3. Orthographic projection: Principles, conventions, Projection of points<br>4. Projection of straight lines: Simple position, inclined to one plane<br>5. Projection of straight lines inclined to both the planes (without traces and mid-point)<br>6. Projection of planes: Perpendicular planes<br>7. Projection of planes: Oblique planes<br>8. Projection of solids: Simple position<br>9. Projection of solids: Inclined to one plane<br>10. Sections of solids: Prism, pyramid in simple position<br>11. Sections of solids: Cone and cylinder in simple position<br>12. Isometric projections and views<br>13. Conversion of isometric views to orthographic projections and vice versa. |
| 8 | HEAT TRANSFER LAB | **List of Major Equipment / Facilities**<br>i) Emissivity measurement apparatus,<br>ii) Parallel flow & counter flow heat exchanger,<br>iii) Pin fin apparatus<br>**List of Experimental Setup in each Laboratory**<br>1. Thermal conductivity of composite wall.<br>2. Convective heat transfer coefficient under Natural and Forced convection phenomena using pin-fin apparatus.<br>3. Emissivity of a given plate.<br>4. Stefan-Boltzmann constant.<br>5. Heat transfer coefficient in parallel and counter flow heat exchanger.<br>6. Performance parameters of an alternative fuel on a vertical stroke single cylinder diesel engine. |
| 9 | MACHINE TOOLS ENGINEERING LAB | **List of Major Equipment / Facilities**<br>i) GNM2-Lathe-04,<br>ii) Tiger-Lathe-04,<br>iii)MK(Mysore Kirloskar) Lathe-04,<br>iv)GEDEE WEILER Lathe-02,<br>v)Universal milling machine,<br>vi)HMT Lathe with force measurement interfaced to the system<br>vii)PSG Lathe-02,<br>viii) Lathe Tool Dynamometer<br>ix)Drill Tool Dynamometer<br>x)Milling Tool Dynamometer |

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| | | **List of Experimental Setup in each Laboratory**<br>1. Facing and plain turning operations on lathe.<br>2. Step turning and knurling on lathe machine.<br>3. Taper turning on lathe.<br>4. Drilling and boring on lathe.<br>5. Thread cutting on lathe<br>6. Influence of process parameters on MRR in turning operation.<br>7. Grinding of single point cutting tool.<br>8. Gear cutting using (a) Plain Indexing. (b) Compound indexing using universal dividing head.<br>9. Measurement of cutting forces during machining on lathe machine and milling machine.<br>10. shear angle experimentally in turning operation.<br>11. Grinding flat surfaces using surface grinding machine and measurement of surface finish.<br>12. Process parameters of electro discharge machining (EDM).<br>13. Design utility component, prepare process sheet for the manufacturing of the same and produce the component in the lab. |
| 10 | METAL FORMING LAB | **List of Major Equipment / Facilities**<br>i) Dies<br>ii) Shearing machine,<br>iii) Power operated hydraulic press 25 T,<br>iv) Hydraulic press Capacity – 50 Tons<br>iv) Semi-Hydraulic Pipe Bending<br>v) Spinning Machine<br>**List of Experimental Setup in each Laboratory**<br>1. Evaluation of Formability of a given sheet material using Erichsen cupping test.<br>2. Progressive die design and manufacturing of washer components using the same on a fly press (capacity 6 Tons) and estimation of forces.<br>3. Compound die design and manufacturing of washer components using the same on double body fly press (capacity 8 Tons) and estimation of forces.<br>4. Combination die design and manufacturing of cylindrical cups using the same on a hydraulic power press (capacity 50 Tons) and estimation of drawing force.<br>5. Study of extrusion dies and demonstration of extruding lead material |
| 11 | MATERIAL SCIENCE AND METALLURGY LAB | **List of Major Equipment / Facilities**<br>i) Metzer – M (Metz – 56) inclined monocular metallurgical microscope (5No's)<br>ii) Metzer – M (Metz – 57) binocular metallurgical microscope (1 No)<br>iii) Master double disk polisher<br>iv) Inverted Binocular Microscope with Camera,<br>v) Rockwell hardness tester , Salt Bath Furnace, Microscopes<br>vi) PC based image analysis system include color ccd camera framer gabber card and full image analyser software |

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| | | **List of Experimental Setup in each Laboratory**<br><br>1.Study of: Metallurgical Microscope, Allotropes of Iron, Iron-Iron carbide diagram, Procedure for specimen preparation.<br>2. Observations for the following specimens - i) Low carbon steels, ii) Medium carbon steels,<br>iii) Eutectoid steels, iv) High Carbon steels, v) Stainless steels,<br>vi) Case carburized, vii)HSS, viii) White cast iron, ix) Gray cast iron,<br>x) alleable iron, xi) Spheroidal iron,<br>xii) Al–Si alloy and determination of grain size using Image Analyzer.<br>3. Preparations of the following specimens : i) á " â Brass, ii) Normalised steel iii) Medium carbon steel iv) Nodular cast iron v) Grey cast iron.<br>4.Heat Treatment Processes<br>i) Annealing ii) Normalizing iii) Hardening. |
| 12 | METROLOGY & INSTRUMENTATION LAB | **List of Major Equipment / Facilities** |
| | | i) Tool makers microscope, Measuring project M.P. 320 magnifications<br>ii) Zeiss Measuring Optical Projector MP-320<br>iii) DAK Strain Gauge Starter kit<br>iv) Taylor Hobson Talysurf Surface Roughness Tester S-100 Series<br>v) Optical/Profile Projector 400TE, Computerized Measuring System With 2D Software |
| | | **List of Experimental Setup in each Laboratory**<br>1. Measurement with inside, outside and depth micrometers.<br>2. Measurement with height gauges, height masters.<br>3. Measurement of linear and angular dimensions with Tool maker's microscope – diameter of thin wire and single point cutting tool angle.<br>4. Measurement with dial indicator and its calibration.<br>5. Measurement of angles with sine bar and clinometers.<br>6. Measurement of roundness errors with bench centers.<br>7. Measurement of flatness errors of a surface plate with precision spirit level.<br>8. Measurement with optical profile projector.<br>9. Design of plugand snap gauges for a given component.<br>10. Surface roughness measurement by Taylor Hobson -Talysurf.<br>11. Measurement of gear tooth thickness by gear tooth vernier.<br>12. Displacement measurement with LVDT.<br>13**.** Analyze, assess, measure and document all Measuring attributes of a selected component by using appropriate methods and devices. |
| 13 | WELDING LAB | **List of Major Equipment / Facilities** |
| | | i) Welding Generator 300 Amps,<br>ii) Welding transformer air cooled (Advani),<br>iii) MIG Welding( including CO2 Gas cylinder)<br>iv) Welding Rectifier Throlex (401)(TLG)<br>v) TIG Welding attachment model(ADOR TLG 25/30)<br>vi) Submerged arc welding machine |

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| | | **List of Experimental Setup in each Laboratory**<br>**Welding:**<br>1. Comparison of the bead geometry with DCSP, DCRP and A.C.<br>2. Spot of welding of MS Sheets.<br>3. Plotting cooling curve in TIG welding process.<br>4. Finding out deposition efficiency in SAW Process.<br>5. Weld bead geometry formed in MIG welding. |
| 14 | THERMAL SYSTEM LAB | **List of Major Equipment / Facilities**<br>i) 4S Single Cylinder 3.68 DE, with computer interface,<br>ii) Heat Exchanger Equipment<br>iii) Heat pipe demonstration<br>iv) Coefficient of thermal expansion -Measurement of solids, liquids and gases<br>v) Thermal capacity of solids<br>vi) Determination of Isentropic coefficient of air-Clement Desormes Method<br>vii) Kirloskar 5 HP Diesel engine with computer interfacing<br>viii) Cross flow heat exchanger<br>ix) Multicylinder 4-Stroke Diesel engine |
| 15 | COMPUTATIONAL FLUID LAB | **List of Major Equipment / Facilities**<br>i) HP Z220 Workstation Consisting Of Ram-8GB, HDD-1TB, Graphic Card-1GB,<br>ii) LRD Monitor-18.5"-25 Nos,<br>iii) Altair Hyper WorksV-12 -2 users<br>iv) ANSYS<br>**List of Experimental Setup in each Laboratory**<br>1.Laminar Flow over Flat plate<br>2. Laminar Pipe Flow<br>3. Steady Flow past a Cylinder<br>4. Unsteady Flow past a Cylinder<br>5. Two Dimensional Steady Free Convection<br>6. Forced Convection for pipe cross section<br>7. Study of Hot & Cold Fluid Mix<br>8. Flow analysis of Aerofoil.<br>9. Study of compressible flow through a nozzle<br>10. Partially premixed combustion analysis<br>11. Supersonic flow over a wedge<br>12. Study of flow over wind turbine blade/flow through bifurcation artery |
| 16 | THERMAL ENGINEERING LAB | **List of Major Equipment / Facilities**<br>i) Solar Thermal Training System<br>ii) Solar Concentrator Training System<br>iii) Wind-PV Hybrid Training System<br>iv) Air conditioning Test Rig<br>i) Refrigeration Tutor<br>v) Axial Flow fan<br>v) Centrifugal Blower Test rig<br>vi) Nozzle pressure distribution apparatus<br>vii) Air conditioning Tutor<br>viii) Subsonic Wind Tunnel |

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| | | **List of Experimental Setup in each Laboratory**<br>1. Thermal conductivity of metal rod.<br>2. Critical heat flux for copper wire in water.<br>3. Convective heat transfer coefficient for condensation and boiling equipment.<br>4. pressure distribution for convergent and divergent nozzle<br>5. overall efficiency of axial flow fan<br>6. overall efficiency of centrifugal blower<br>7. COP of refrigerating tutor<br>8. COP of air conditioning tutor<br>9. Evaluate the effectiveness of cross flow heat exchanger.<br>10. pressure distribution for a cylinder<br>11. pressure distribution for an aerofoil.<br>12. lift and drag coefficient for different contours<br>13. wind tunnel performance by using the modeling and simulation |
| 17 | HEXAGON LAB | **List of Major Equipment / Facilities**<br>i) HP 3330 DESKTOP , 15 Nos<br>ii) CESAR-II,PV Lite, Tank, GT Strudl |
| | | **List of Experimental Setup in each Laboratory**<br>Value added lab |
| 18 | ROBOTICS AND DRONES LAB | **List of Major Equipment / Facilities**<br>1 Arduino UNO<br>2 12V 1A DC Power Supply Adapter<br>3 USB 2.0 printer cable<br>4 DC Motor in micro servo body<br>5 Stepper motor<br>6 Stepper motor board<br>7 Ultrasonic distance sensor<br>8 L298N motor drive<br>9 Geared DC motor<br>10 Single shaft BO motor (60 rpm)<br>11 Rotary encoder<br>12 IR infrared obstacle avoidance sensor<br>13 170 points breadboard<br>14 840 points breadboard<br>15 Metal film resistor and LED kit<br>16 LIPO Rechargable battery<br>17 A2212/13T Brushless motor<br>18 Electronic speed controller (30A ESC)<br>19 Pixwhak drone controller full kit<br>20 Digital Multi Servo Tester ESC CCPM<br>21 "FS-i6S Remote Control 2.4G 10CH AFHDS with FS-IA10B Receiver and Mobile Holder"<br>22 10x4.5 inch-1045/1045R CW CCW Propeller Pair<br>23 "ADEPT Digital Anemometer Wind-Speed Gauge Meter"<br>24 Stemedu TFmini-S lidar range finder sensor module<br>25 Jumper wires<br>26 iMax B6AC Smart Balance Charger 80W<br>26 "Quadcopter Drone Combo with Pixhawk Kit for beginner "<br>27 S550 Hexacopter Combo Kit<br>28 Stand-alone Drone kit with pixhawk4<br>30 Transparent plastic boxes<br>31 Multi purpose mini screw driver kit |

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| | | **List of Experimental Setup in each Laboratory**<br>1. Assembling of robot mechanical components, mounting of motors, sensors, electronic circuits to the chassis.<br>2. Connecting to electronic circuitry: motor drivers, incremental encoders proximity sensors, micro controller,<br>3. Different types of batteries, selection of suitable battery for application, safety precaution.<br>4. Introduction to Linux Command Line Interface: basic file and directory management and other useful commands<br>5. Controlling robot using Python: i) Move robot using Python code, ii) Make robot move in patterns using Python<br>6. Robot programming with Sensor inputs:i) Read sensor data using Python, ii) Visualize sensor data using Python, iii) Code robot to avoid obstacles by using sensor data<br>7. Open CV: i) Create an Image and display an image; ii) Read and change pixel values; iii) Create colored shapes and save image; iv) Extract the RGB values of a pixel; v) Reading and Writing Videos<br>8. Open CV: i) Extraction of Regions of Interest; ii) Extraction of RGB values of a pixel<br>9. Coding robot to work with colors, follow colored objects, identifying shape of the object-oriented<br>10. Projects: i)Making a line follower robot using a Camera; ii) Writing code for a complex function<br>11. Assembly of a drone |

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
# HYDERABAD - 500 075

## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: EEE**

| S. No. | Name of the Laboratory | Details |
|---|---|---|
| 1 | BASIC ELECTRICAL ENGINEERING LAB | **List of Major Equipment / Facilities** |
| | | i. 3kw MG SET DC COMPOUND Generator |
| | | ii. 3kw MG SET DC COMPOUND Generator |
| | | iii. 3kva Alternator MG Set |
| | | iv. 3kw DC Compound Motor |
| | | v. 3 kw DC Series Motor |
| | | vi. 3kw DC Shunt Motor |
| | | vii. 3 HP 3 P HASE Induction Motor |
| | | viii. Single Phase Energy Meter |
| | | ix. Motor- Generator set |
| | | x. CRO Demonstration Kit |
| | | xi. 100 MHz DSO |
| | | xii. Cut-Out Section of Synchronous Machine |
| | | xiii. CRO |
| | | xiv. Regulated power supply |
| | | xv. Cut-Out Section of Induction Motor |
| | | xvi. Cut-Out Section of DC Machine |
| | | xvii. Transient/Steady State response Kit |
| | | xviii. Rectifier |
| | | xix. Single Phase Transformer 210/110v |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Verification of KCL and KVL. |
| | | ii. Verification of Thevenin's theorem |
| | | iii. Verification of Norton's theorem |
| | | iv. Determination of parameters of a choke or coil by Wattmeter Method |
| | | v. Charging and discharging of Capacitor |
| | | vi. Power factor improvement of single-phase AC System. |
| | | vii. Active and Reactive Power measurement of a single-phase system using 3-Ammeter method and 3-Voltmeter method |
| | | viii. Measurement of three phase power in a balanced system |
| | | ix. Calibration of single-phase energy meter |
| | | x. Verification of Turns/voltage ratio of single-phase Transformer |
| | | xi. Open Circuit and Short Circuit tests on a given single phase Transformer |
| | | xii. Load test on DC Shunt motor |
| | | xiii. Speed control of DC Shunt motor |

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| | | xiv. Demonstration of cut-out section of machines like DC machine, Induction machine etc. |
| | | xv. Demonstration of Measuring Instruments and Electrical Lab components. |
| | | xvi. Demonstration of Low Tension Switchgear Equipment/Components |
| **2** | **ELECTRICALMACHINES-II LAB** | **List of Major Equipment / Facilities** |
| | | i)1.Dc series motor set with loading<br>2.DC starter |
| | | ii)1.Dc shunt motor set with loading arrangement<br>2.Dc starter |
| | | iii)1.Dc compound motor set with loading<br>2.Dc starter |
| | | iv) 3 Phase Squirrel Cage Induction Motor |
| | | v) STAR DELTA starter |
| | | vi) 3 phase slip ring motor<br>3.7KW,415V,7.5Amp |
| | | vii) Resistance Starter for the Slip ring Induction Motor |
| | | viii)1 Phase induction motor<br>1.1KW/1.5HP,230V |
| | | ix) **M-G set**<br>1. DC motor 5.2 kw<br>2. alternator 7.5KVA |
| | | x)**M-G set**<br>1.DC motor 5.2 kw<br>2.alternator 7.5KVA |
| | | xi)**M-G set**<br>1.DC Motor (3.7KW,220V,18.6Amps)<br>2.DC Series Generator (3.5KW,220V,15.9Amps) |
| | | xii)**M-G set**<br>1.DC Motor (3.5KW,220V,21Amps)<br>2.DC Shunt Generator (3.5KW,220V,15.9Amps) |
| | | xiii)**M-G set**<br>1.DC Motor (3.5KW,220V,21Amps)<br>2.DC shunt Generator (3.5KW,220V,15.9Amps) |
| | | xiv)3phase synchronous motor (3.5 KVA, 440-415V) |
| | | xv) transformer 1 phase(230/110V) |
| | | xvi)Scott connected transformer 3 phase<br>(440V, 3Φ, &230V, 2Φ) |
| | | xvii) 1.Dc shunt motor set with loading arrangement<br>2.Dc starter |
| | | xviii) Rectifier |
| | | xix) 1phase Loading Rheostat |
| | | xx) 3phase Choke Coil (Inductive load) |
| | | xxi) Potential Transformers |
| | | xxii) 3phase AUTO Transformer |
| | | xxiii) Phase Shifting Transformer |
| | | xxiv) transformer 3 phase |
| | | xxv) 3phase Loading Rheostat |

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| | | **List of Experimental Setup in each Laboratory** |
| | | i)Three-phase T/F (Scott connection) |
| | | ii)Single –phase Induction motor |
| | | iii)Speed Control of 3 phase Induction motor V/F Control method |
| | | iv)No –load test of slip ring induction motor |
| | | v)No –load test, blocked rotor test on 3 –phase squirrel cage Induction motor |
| | | vi)Power factor improvement of induction motor using capacitors |
| | | vii)Voltage regulation of alternator by 1)Synchronous impedance method 2)Ampere –turn method. |
| | | viii) Voltage regulation of Alternator by Zero Power factor method |
| | | ix) Synchronization of three phase Alternator to bus bar using dark lamp method |
| | | x) V and invested V curves of synchronous motor |
| **3** | **ELECTRICAL MACHINES-I LAB** | **List of Major Equipment / Facilities** |
| | | i)3kw MG SET DC COMPOUND Generator |
| | | ii) 3kw MG SET DC SHUNT Generator |
| | | iii) 3kva Alternator MG Set |
| | | iv) 3kw DC SHUNT Motor |
| | | v) 3 kw DC Series Motor. |
| | | vi) 3kw DC Shunt Motor. |
| | | vii) 3 HP 3 P HASE Induction Motor. |
| | | viii) 1phase Transformer. |
| | | ix) 3kw MG SET DC SHUNT Generator. |
| | | x) 3phase AUTO Transformer . |
| | | xi) Rectifiers. |
| | | xii) Loading rheostat. |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) OCC and load characteristics of separately excited DC generator. |
| | | ii) OCC and load characteristics of DC shunt generator. |
| | | iii) Swinburne's test on DC shunt machine . |
| | | iv)Brake test on DC series motor |
| | | v) Hopkinson's test on two identical dc shunt machines. |
| | | vi) Separation of stray losses of DC shunt machine. |
| | | vii) Load test on single phase transformers. |
| | | viii) Sumpner's test on two identical single-phase transformers. |
| | | ix) Study of three-phase transformer connections. |
| | | x) Load characteristics of DC compound generator. |
| **4** | **CONTROL SYSTEM LAB** | **List of Major Equipment / Facilities** |
| | | i. D.C servomotor kit |
| | | ii. A.C servomotor kit |
| | | iii. Frequency response of compensating network |
| | | iv. Synchro Transmitter and Receiver |
| | | v. Stabilizer 10 KVA |
| | | vi. Stabilizer 10 KVA |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) characteristics of D.C servomotor |

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| | | ii)D.C servomotor A.C servomotor |
| | | iii) D.C servomotor synchro pair |
| | | iv) Temperature ON/OFF control system |
| | | v)D.C position control system |
| | | vi) Step response of second order system |
| | | vii) characteristics Magnetic amplifier |
| | | viii)Lead & lag compensating networks |
| | | ix)Linear system simulator |
| | | x)Step angle measurement for Stepper motor |
| **5** | **ANALOG ELECTRONICS CIRCUITS LAB** | **List of Major Equipment / Facilities** |
| | | i)CROs 30MHz -04nos |
| | | ii) DSOs 50MHz-06 nos |
| | | iii) Function Generators 10MHz- 10 Nos |
| | | iv) Regulated Power Supply- 10 |
| | | **List of Experimental Setup in each Laboratory** |
| | | i)V-I characteristics of (Silicon ) diode |
| | | ii) Zener diode characteristics and its application as a voltage regulator. |
| | | iii) Half Wave and Full Wave rectifier with and without filters |
| | | iv) Characteristics of BJT and MOSFET |
| | | v) Design of biasing circuits for BJT |
| | | vi) Design of biasing circuits for MOSFET |
| | | vii) Frequency response of common emitter BJT Amplifier |
| | | viii) Measurement of OP-Amp parameter |
| | | ix) Design of integrator and differentiator using OP-Amp |
| | | x)Design of active filters |
| | | xi) Generation of Triangle and square Waveforms using OP-Amp |
| | | xii) Design of Clampers using OP-Amp. |
| | | xiii)Design of Clippers using OP-Amp |
| | | xiv) Analysis of hysteric comparator using Schmitt Trigger |
| | | xv)Design of 555 Timer in Astable Mode |
| **6** | **DIGITAL ELECTRONICS LAB** | **List of Major Equipment / Facilities** |
| | | i. Digital IC Trainer- 15Nos |
| | | ii. Analog to Digital converter- 6 Nos |
| | | iii. Digital to Analog converter-6 Nos |
| | | iv. CROs 30 MHz- 3 Nos |
| | | v. 2:1,4:1 Mux using gates- 6Nos |
| | | vi. 1:8 De-mux & Decoder using 74138 IC |
| | | vii. SISO and SIPO using IC 7474 |
| | | viii. PISO and PIPO using IC 7474 |
| | | **ix.** Ring and Jonson counter using IC 7476 |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Verify (a) Demorgan's Theorem for 2 variables. |
| | | ii) The sum-of product and product-of-sum expressions using gates. |
| | | iii) Design and implement (a) Full Adder using basic logic gates. (b) Full subtractor using basic logic gates |

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| | | iv) Design and implement 4-bit Parallel Adder/ subtractor using IC 7483. |
| | | v) Design and Implementation of 4-bit Magnitude Comparator using IC 7485. |
| | | vi) Realize (a) 4:1 Multiplexer using gates.<br>(b) 3-variable function using IC 74151(8:1MUX). |
| | | vii) Realize 1:8 Demux and 3:8 Decoder using IC74138. |
| | | viii) Realize the following flip-flops using NAND Gates. (a) Clocked SR Flip-Flop (b) JK Flip-Flop |
| | | ix) Realize the following shift registers using IC7474 (a) SISO (b) SIPO (c) PISO (d) PIPO. |
| | | x) Realize the Ring Counter and Johnson Counter using IC7476. |
| | | xi) . Realize the Mod-N Counter using IC7490. |
| | | xii) Design of synchronous counters using flip-flops. |
| | | xiii) Design of Asynchronous counters using flip-flops. |
| **7** | **POWER SYSTEM LAB (UG)** | **List of Major Equipment / Facilities** |
| | | i) Three phase transmission line |
| | | ii) Numerical differential relay kit |
| | | iii) Static differential relay kit |
| | | iv) Buchholz relay test kit |
| | | v) Static over current relay kit |
| | | vi) Oil testing kit |
| | | vii) 3 phase Auto transformer |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Determination of regulation & efficiency of 3-Phasetransmission lines. |
| | | ii) IDMT characteristics of Over-current relay. |
| | | iii) Determination of A, B, C, D constants of 1-Phasetransmissionline. |
| | | iv) Sequence impedance of 3-PhaseAlternators by fault Analysis.(LG,LL & LLL) |
| | | v) Determination of positive, negative and zero-sequence impedance of 3 – Phase transformers. |
| | | vi) Determination of Synchronous machine reactance and Time constant from 3-Phase S.C test. |
| | | vii) Determination of dielectric strength of Transformer oil and Megger. |
| | | viii) Characteristics of Static Over current Relays. |
| | | ix) Measurement of capacitance of 3-corecables. |
| | | x) Determination of positive, negative and zero-sequence impedance of 3 phase Alternator. |
| | | xi) Determination of Voltage distribution and String efficiency of string of Insulators. |
| | | xii) Study of Series-shunt compensation of a long transmission line. |
| **8** | **CIRCUITS AND MEASUREMENTS LAB** | **List of Major Equipment / Facilities** |
| | | i. Phase Shifting Transformer (AE) |
| | | ii. Epstein square Bridge (Zaran) |
| | | iii. Oscilloscopes |
| | | iv. Anderson's Bridge (OSAW) |
| | | v. Maxwell's Inductance Bridge (OSAW) |

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| | | vi. Loading Rheostats |
| | | vii. Transformers |
| | | viii. Voltmeters |
| | | ix. Solar PV Emulator |
| | | x. DC Potential |
| | | xi. Kelvins double bridge |
| | | xii. Digital Strain gauge & LVDT |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Frequency response of RLC series circuit. |
| | | ii. Frequency response of RLC Parallel circuit |
| | | iii. Verification of Maximum power transfer theorem. |
| | | iv. Determination of Z, Y, ABCD & h parameters of two-port network |
| | | v. Measurement of unknown resistance using Kelvin's double bridge.. |
| | | vi. Measurement of unknown Inductance using Maxwell's bridge and validating with LCR meter |
| | | vii. Measurement of unknown inductance using Anderson's bridge and validating with LCR meter |
| | | viii. Measurement of iron losses using Epstein's square bridge. |
| | | ix. Measurement of strain using strain gauge. |
| | | x. Measurement of Displacement using LVDT |
| | | xi. Measurement of unknown voltage using D.C Crompton's potentiometer |
| **9** | **ELECTRICAL SIMULATION LAB-I (UG)** | **List of Major Equipment / Facilities** |
| | | i. HP Make Intel core I3 processor HDD 320GB Ram 2GB @ 3.2Ghz |
| | | ii. Dell Make Intel core I5 processor HDD 1 TB Ram 8GB @ 3.2Ghz |
| | | iii. Matlab- 2022b Campus wide license |
| | | iv. 10KVA UPS (CYBER) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Verification of Basic Theorems 2.Timeresponse of R, L, C circuits. |
| | | ii. Determination of power angle diagram for Salient and Non-salient pole synchronous machine. |
| | | iii. Time Domain Analysis of LTI Systems |
| | | iv. Effect of PID Controllers |
| | | v. Stability Analysis of Unity Feedback Control Systems |
| | | vi. Computation of line parameters |
| | | vii. Modeling of Transmission Lines |
| | | viii. Load Flow Studies. |
| | | ix. Fault Analysis. |
| | | x. Transient stability studies |
| | | xi. Economic load dispatch |
| | | xii. Load Frequency control of single-area and two-area systems |
| | | xiii. Determination of Load Flows using ANNs |
| | | xiv. Economic Load Dispatch using Genetic Algorithm |

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| **10** | **POWER ELECTRONICS LAB (UG)** | **List of Major Equipment / Facilities** |
| | | i. Clamp on Power meter |
| | | ii. Digital Oscilloscopes |
| | | iii. SCR Modules |
| | | iv. 3-Phase Half & Full Controlled Bridge Rectifier |
| | | v. 1-Phase Bridge Inverters |
| | | vi. 1-Phase AC Voltage Controller |
| | | vii. Dual Converter |
| | | viii. Buck-Boost Chopper |
| | | ix. Two Quadrant DC Drive |
| | | x. Closed Loop Control of DC Drive |
| | | xi. Speed Control of 3-phase Wound Rotor Induction Motor |
| | | xii. 1-phase Half Controlled Bridge Converter |
| | | xiii. 3-phase Mc-Murray Bed-Ford Inverter |
| | | xiv. 3-phase IGBT based Inverter |
| | | xv. 1-phase IGBT based inverter |
| | | xvi. Current Commutated Chopper |
| | | xvii. Voltage Commutated Chopper |
| | | xviii. 1-ph Cyclo-Converter |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Study of static characteristics of S.C.R. and to measure latching & holding currents. |
| | | ii) Study the characteristics of BJT, MOSFET and IGBT. |
| | | iii) R, RC and UJT triggering circuits for SCR. |
| | | iv) Study of forced commutation techniques of SCR. |
| | | v) Single-phase half-controlled bridge rectifier with R and RL loads. |
| | | vi) Single-phase fully controlled converter with R, RL & RLE loads and freewheeling diode. |
| | | vii) Three-phase half-controlled bridge rectifier with R and RL loads. |
| | | viii) Three-phase fully controlled bridge rectifier with R and RL loads. |
| | | ix) DC voltage control using Buck and Boost choppers. |
| | | x) Voltage and Current commutated choppers with R&RL loads. |
| | | xi) Single-phase step down Cyclo-converter with Rand RL loads. |
| | | xii) Single-phase A.C voltage controller with R and RL loads. |
| | | xiii) Half and Full bridge inverters with R&RL loads. |
| **11** | **MICRO CONTROLLER & IT'S APPLICATIONS LAB** | **List of Major Equipment / Facilities** |
| | | i. 8086 Micro Processor Trainer Kits |
| | | ii. DAC Interface Card, combined ADC/DAC Interface Card, Traffic Signal Controller, Keyboard and Display Interfacing Cards |
| | | iii. SMPS 8086 Kits |
| | | iv. 8051 Micro Controller Trainer Kits with LCD Display, 64KB memory, 32KB EPROM 8255 port along with PC Compatible Keyboards. |

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| | | v. ARM7 (LPC2148) Microcontroller Trainer Kits 512K Internal Flash Memory and 32+8K RAM with power supply with various interface section on the same board. stepper motor, DC motor, |
| | | vi. 8051 Micro Controller Trainer Kits with LCD Display, 64KB memory, 32KB EPROM 8255 port along with PC Compatible Keyboards. |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Simple 8051 Microcontroller Assembly Language Programs under Different Addressing Modes |
| | | ii. 8051 Microcontroller Assembly Language Programming using Arithmetic and Logical Instructions |
| | | iii. 8051 Microcontroller Interfacing Applications using LED ( Without using SFRs and with SFRs) |
| | | iv. Generation of Waveform using DAC by Interfacing it with 8051 Microcontroller |
| | | v. Stepper Motor Interfacing |
| | | vi. Simple Assembly Language Programs using ARM7 Instruction Set |
| | | vii. Interfacing Applications using LEDs with ARM7 Microcontroller |
| | | viii. Buzzer and Relay Interfacing with ARM7 Microcontroller |
| | | ix. Generation of Waveforms using Internal DAC of ARM7 Microcontroller |
| | | x. DC Motor Interfacing with ARM7 Microcontroller |
| | | xi. Simple Assembly Language Programs using ARM7 Instruction Set |
| | | xii. Interfacing Applications using LEDs with ARM7 Microcontroller |
| 12 | **Electrical Drives Lab (ED)** | **List of Major Equipment / Facilities** |
| | | i. Speed control of dc drive using Thyristor controlled rectifier |
| | | ii. Speed control of dc drive using dc-dc chopper |
| | | iii. Four quadrant operation of dc-dc drives |
| | | iv. Closed loop speed control of dc motor using PID controller |
| | | v. Speed control of single phase induction motor using v/f triac control |
| | | vi. Speed control of three phase induction motor using v/f triac control |
| | | vii. Speed control of three phase induction motor using ac-ac converter |
| | | viii. Regenerative dynamic braking operation of ac drive |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Speed control of DC drive using Thyristor controlled rectifier. |
| | | ii. Speed control of DC drive using DC-DC Chopper. |
| | | iii. Four-Quadrant Operation of DC drive. |
| | | iv. Closed loop speed control of DC motor using PID controller. |
| | | v. Speed control of Three-Phase Induction Motor using V/f control. |
| | | vi. Regenerative/Dynamic braking operation for AC drive. |

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| | | vii. Simulation of Speed control of DC Motor using BJT-H bridge. |
| | | viii. Simulation of Regenerative/ Dynamic breaking operation of DC motor. |
| | | ix. Simulation of Step/ Ramp speed response of DC motor. |
| | | x. Simulation of VSI-fed 3-PhaseInduction Motor drive. |
| 13 | **IoT Lab** | **List of Major Equipment / Facilities** |
| | | i. Arduino UNO boards |
| | | ii. Raspberry pi boards |
| | | iii. 7 Inch LCD Touch ScreenDisplay for Raspberry pi |
| | | iv. ESP8266 Node MCU boards |
| | | v. ESP32 with CAM boards |
| | | vi. HC-05 Bluetooth boards |
| | | vii. Sensor Modules |
| | | i. Characteristics of p-n junction diode, Zener diode and Light Emitting Diode (LED) using Arduino IDE |
| | | ii. Design of half wave rectifier using Arduino /Raspberry Pi |
| | | iii. Temperature measurement using Arduino /Raspberry Pi |
| | | iv. Distance measurement using Arduino /Raspberry Pi |
| | | v. Stopwatch control using Arduino / Raspberry Pi |
| | | vi. Traffic Light Controller using Arduino /Raspberry Pi |
| | | vii. Dark Sensing LED using Arduino/Raspberry Pi |
| | | viii. Design of digital dc voltmeter and ammeter using Arduino /Raspberry Pi |
| | | ix. Design of digital ac voltmeter and ammeter using Arduino / Raspberry Pi |
| | | x. Measurement of power and energy using Arduino / Raspberry Pi. |
| | | xi. Speed control of dc motor using Arduino / Raspberry Pi |
| | | xii. Interfacing of motor using relay with Arduino /Raspberry Pi and write a program to turn ON motor when push button is pressed |
| | | xiii. Interfacing of Bluetooth with Arduino /Raspberry Pi and write a program to send sensor data to smartphone using Bluetooth |
| | | xiv. Uploading of temperature and humidity data from Arduino/Raspberry Pi to thing speak cloud |
| | | xv. Retrieval of temperature and humidity data from thing speak cloud to Arduino/Raspberry Pi |
| 14 | **POWER SYSTEMS LAB (PG)** | **List of Major Equipment / Facilities** |
| | | i. Rectifier for Power Systems |
| | | ii. Distribution Panel |
| | | iii. Micro controller-based percentage differential relay |
| | | iv. Solar PV Emulator |
| | | v. Solar PV training & Research System |
| | | vi. M.G.Set |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Measurement of positive, negative and Zero sequence reactance of synchronous machine. |

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| | | ii. Measurement of Positive, negative & Zero Sequence Reactance of 3-ph Transformer. |
| | | iii. Determination of Regulation and efficiency of a 3-ph Transmission line. |
| | | iv. Determination of ABCD Constants of a 3-ph Transmission line. |
| | | v. Characteristics of a Static over Current Relay. |
| | | vi. Deferential Protection of 1-ph Transformer |
| | | vii. IV-PV Characteristics with series and parallel Combination of Modules. |
| | | viii. Study of OVER Voltage and Under Voltage Relay. |
| | | ix. Study of Microprocessor Based inverse Current Relay Characteristics |
| | | x. Single PV module I-V and P-V characteristics with radiation and temperature changing effect |
| 15 | **Power Electronics Lab (PG)** | **List of Major Equipment / Facilities** |
| | | i. 3-ph Step-Down Cyclo Converter, 3-ph controlled Rectifier, 1-ph Dual converter |
| | | ii. 3-ph Controlled Rectifier |
| | | iii. 3-ph Voltage Controller, MOSFET Based ZVS, ZCS, Buck converter, 1-ph & 3-ph Matrix converter, Design of Fly-back converter |
| | | iv. Speed Control of slip ring induction motor using Stodic Kramer Drive |
| | | v. 3-ph drive V/F Vector controller |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Three-phase half controlled and full controlled bridge rectifiers with R and RL loads. |
| | | ii. Analysis of chopper circuit |
| | | iii. Analysis of single-phase series-resonant inverter |
| | | iv. Three-phase Mc-Murray Bed-Ford inverter with Rand RL loads |
| | | v. Three-phase IGBT inverter with R & RL loads. |
| | | vi. Closed-loop control of permanent magnet DC drive |
| | | vii. Three-phase step down cyclo-converter with Rand RL loads |
| | | viii. Static rotor resistance control of slip-ring induction motor. |
| | | ix. Operation of two quadrant dc drive. |
| | | x. Speed control of SRIM using static Kramer's system |

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
# HYDERABAD - 500 075

## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: ECE**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | **Computer Centre** | **List of Major Equipment / Facilities** |
| | | i. National instruments LabVIEW Software (TEQIP) |
| | | ii. Custom Bundle: NI LabVIEW Academy Hardware Bundle: |
| | | iii. Computers |
| | | iv. Custom Bundle NI La View Academy Hardware Bundle of Advanced Simulation Lab Including following items |
| | | v. HSN/SAC Code: 90329000, NI myDAQ- Student kit with LabView & Multisim student edition, part.no. 781327-01 |
| | | vi. 90328910, NI myRIO-1900 for student purchase only including WIFI and MSP Connect, part.no 782693-01 |
| | | vii. 90329000, NI Starter Accessory kit, part.no 783068-01 |
| | | viii. 90329000, Ni myRIO Kits: Mechatronics kit, 7830 69-01 |
| | | ix. 90329000, NI my RIO Kit, Starter kits: Embedded kit part.no.783070-01 |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Using NI –LabVIEW software, signal conditioning circuits, combination, sequential circuits and filter design experiments can be performed |
| | | ii. Analog and digital modulation schemes experiments can be performed using MyRIO Kits |
| | | iii. Data acquisition from various sensors and voltage sweep generation experiment can be performed using MYDAQ |
| 2 | **CN - Lab** | **List of Major Equipment / Facilities** |
| | | i. Computers |
| | | ii. NetSim Academic Version v13.0 |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. All experiments are software related |
| 3 | **Communication Lab** | **List of Major Equipment / Facilities** |
| | | i. CROs-dual channel |
| | | ii. Spectrum Analyzer with Accessories |
| | | iii. Data communication trainer (2 units) |
| | | iv. Optical Fiber training system |
| | | v. CRO 4 channel |
| | | vi. Dual wave length fiber optic source and detector module |
| | | vii. Fiber optic passive component module |
| | | viii. Computer |
| | | ix. Understanding CDMA-DSSS Communication system with BER |
| | | x. 2G/3G GSM Mobile trainer |
| | | xi. CROs-dual channel |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Hardware kits are available to conduct analog and digital communication experiments |

| | | |
|---|---|---|
| **4** | **Microwave Lab** | **List of Major Equipment / Facilities** |
| | | i. Antenna fabrication kit |
| | | ii. Thermistor Mount |
| | | iii. Computer IBM |
| | | iv. Microwave power meter |
| | | v. Computer (Dell i5 ) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Microwave Bench - 8No.s |
| | | ii. Antenna training system -01 No |
| **5** | **LDIC LAB** | **List of Major Equipment / Facilities** |
| | | i. IC Tester –Linear & Digital |
| | | **List of Experimental Setup in each Laboratory:** |
| | | i. IC trainer kits are available to conduct linear and Digital IC experiments |
| **6** | **ED/Analog Circuits Lab** | **List of Major Equipment / Facilities** |
| | | i. 1.5 MHz-225 MHz AM/FM Generator |
| | | ii. IBM Computer |
| **7** | **SP/ EDA Lab** | **List of Major Equipment / Facilities** |
| | | i. Computers |
| | | ii. MATLAB Campus wide unlimited toolboxes Renewed |
| | | iii. HDL software |
| | | iv. Trainer Kits |
| | | v. DSP Starter Kits |
| | | vi. DSP Kits |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. PC installed with MATLAB and connected to DSP kit |
| **8** | **ES & VSLID Lab** | **List of Major Equipment / Facilities** |
| | | i. Computers |
| | | ii. Cadence Software |
| | | iii. Atlys Spartan 6 FPGA Boards |
| | | iv. Zed Boards (Zynq-7000 EPP Development kit)-10 |
| | | v. CADANCETOOLS-FE &BE Bundle |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. PC installed with keil and Flash Magic and also connected to the ALS/EVBRD/ARM7T7 Evaluation board |
| | | ii. PC installed with MATLAB and connected to TMS320C6748 DSP kit |
| **9** | **Microcontrollers Lab** | **List of Major Equipment / Facilities** |
| | | i) Embedded 8051 mc kits and Interfacing modules |
| | | ii) ARM7 Trainer Kits (LPC2148) and Interfacing modules |
| | | iii) ARM cortex M3/M4Development boards with on board interface modules & sensors |
| | | iv) Wind River VX Works (software) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Interfacing applications using LEDs, Switches, Relays, Buzzer, ADC, DAC, Sensors, LCD, 7-segment display, DC and Stepper motors with 8051 Microcontroller for BE Students |
| | | ii. Applications on on-chip ADC, DAC and PWM modules of LPC2148 and Interfacing applications using LEDs, Switches, Relays, Buzzer and DC Motor with LPC2148 for BE Students |

| | | |
|---|---|---|
| | | iii. Applications on on-chip PLL module, Timers, PWM, UART, ADC and Interfacing applications using LED, RGB LED, Sensors with ARM cortex M3/M4Development boards for ME(ES&VLSID) Students |
| | | iv. RTOS Timer programming, Task function programming, Multitasking, Scheduling, IPC using VxWorks for ME (ES&VLSID) Students |
| **10** | **NCRC Lab** | **List of Major Equipment / Facilities** |
| | | i. Computers |
| | | ii. High Performance Electromagnetic Simulation Software,<br>iii. MATLAB |
| | | iv. ADSP -21479 EZ board<br>v. Evaluation Board |
| | | vi. IRNSS-SPS-GPS Receiver (S.No.18000) |
| | | vii. IRNSS-GPS-SBAS Receiver<br>(S.No 18700) |
| | | viii. RF FieldFox Analyzer |
| | | ix. IRNSS/GPS/SBAS Receivers |
| | | x. Laptops<br>8GB RAM |
| | | xi. POLAR S5 INOSPHERE MONITORING GNSS RECEVER |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Navigational Experimental setups are available to carryout various projects |
| **11** | **Projects Lab** | **List of Major Equipment / Facilities** |
| | | i. Computers |
| | | List of Experimental Setup in each Laboratory: |
| | | i. Experimental setups are available to carry out software Programs and projects |
| **12** | **Basic Electronics Lab** | **List of Major Equipment / Facilities: Nil** |
| | | **List of Experimental Setup in each Laboratory:** |
| | | i. Analog Digital Circuit development platform |
| **13** | **EMS Lab** | **List of Major Equipment / Facilities: NIL** |
| | | **List of Experimental Setup in each Laboratory:** |
| | | i. Experimental setups are available to conduct all the experiments as per the curriculum |
| **14** | **EWN Lab** | **List of Major Equipment / Facilities: NIL** |
| | | **List of Experimental Setup in each Laboratory:** |
| | | i. Experimental setups are available to conduct all the experiments as per the curriculum |
| **15** | **GREEN OPTO NANO ENERGY LAB: G-1 LAB** | **List of Major Equipment / Facilities:**<br>i. Solar Simulator,<br>ii. Electrochemical Workstation,<br>iii. Chemical Vapour Depositor,<br>iv. UV-VIS Spectrometer,<br>v. Spin Coater,<br>vi. High Power Computing |
| | | **List of Experimental Setup in each Laboratory:**<br>**i.** Solar cells and Fuels and Nano materials Synthesis Experimental setups are available to carryout various projects |

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
# HYDERABAD - 500 075

## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: CSE**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | LAB-I | **List of Major Equipment / Facilities** |
| | | i. HP Pro 330MT , Intel core i5 550 @ 3.2GHz, Intel board, 8 GB RAM,1 TB HDD, 18.5'' TFT Monitor,Keyboard and mouse **(No:30)** |
| | | ii. 30 KVA UPS Online with ½ hour backup Sharing with lab2 & lab3**(No:01)** |
| | | iii. 3.5 Ton Cassette AC **(No:02)** |
| | | iv. Cisco SG-300, 48-port Manageable switch **(No:01)** |
| | | v. HP Laser jet 1020 Plus **(No:01)** |
| | | vi. 6-U Communication rack **(No:01)** |
| | | vii. LCD Projector with Screen **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Jupyter notebook |
| | | ii. Dev C++ |
| 2 | LAB-II | **List of Major Equipment / Facilities** |
| | | i. HP Pro-Desk 400-G2MT Desktop Intel Core i7/4770 Processor, 8 GBRAM, 1 TB HDD, 18.5" LED Monitor, Keyboard and mouse **(No:30)** |
| | | ii. 30 KVA UPS Online with ½ hour backup Sharing with lab1 & lab3 **(No:01)** |
| | | iii. 3.5 Ton Cassette AC **(No:02)** |
| | | iv. Cisco SG-300, 48-port Manageable switch **(No:01)** |
| | | v. HP Laser jet 1020 Plus **(No:01)** |
| | | vi. 6-U Communication rack **(No:01)** |
| | | vii. LCD Projector with Screen **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. SQL Developer, Linux OS, Java, Python |
| | | ii. PHP, MySQL, Apache |
| 3 | LAB - III | **List of Major Equipment / Facilities** |
| | | i. HP 400-G2MT Desktop Intel Core i5/4570 Processor, 8 GB RAM, 1 TB HDD, 18.5" LED Monitor, Keyboard and mouse **(No:30)** |
| | | ii. 30 KVA UPS Online with ½ hour backup Sharing withlab1 & lab2 **(No:01)** |
| | | iii. 3.5 Ton Cassette AC **(No:02)** |
| | | iv. Cisco SG-300, 48-port Manageable switch **(No:01)** |
| | | v. HP Laser jet 1020 Plus **(No:01)** |
| | | vi. 6-U Communication rack **(No:01)** |
| | | vii. LCD Projector with Screen **(No:01)** |

| | | |
|---|---|---|
| | | **List of Experimental Setup in each Laboratory** |
| | | i. SQL Developer, Linux OS, Java, Python |
| | | ii. PHP, MySQL, Apache |
| 4 | LAB - IV | **List of Major Equipment / Facilities** |
| | | i. Dell OptiPlex 3060 Core i7 Processor, 32 GB Ram, 1TB HDD, 20" LCD Monitor, Keyboard, Mouse **(No:30)** |
| | | ii. HP Intel Core i7, 16 GB RAM, 1 TB HDD, 18.5" LED iii. Monitor, Keyboard and Monitor. **(No:10)** |
| | | iv. 30 KVA UPS Online with ½ hour backup Sharing with lab5 & lab6 **(No:01)** |
| | | v. 3.5 Ton Cassette AC **(No:2)** |
| | | vi. 24 Port CISCO Manageable Switch **(No:01)** |
| | | vii. 24 Port D-Link Switch **(No:01)** |
| | | viii. HP Laser 1020Plus **(No:01)** |
| | | ix. 6 U Wall Mounted Rack **(No:01)** |
| | | x. LCD Projector with Screen **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Ubuntu 20.1, jupyter notebook, |
| | | ii. Anaconda python, Dev C++ |
| 5 | LAB - V | **List of Major Equipment / Facilities** |
| | | i. HP 3330 Desktop, Intel Core i7, 8 GB RAM, 1 TB HDD, 18.5" LED Monitor, Keyboard and Monitor, Graphic Card. **(No:30)** |
| | | ii. HP Pro 330MT , Intel core i5 550 @ 3.2GHz, Intel board, 8 GB RAM,1 TB HDD, 18.5'' TFT Monitor, iii. Keyboard and mouse **(No:04)** |
| | | iv. 30 KVA UPS Online with ½ hour backup Sharing with lab4 & lab6 **(No:01)** |
| | | v. Split Air Conditioners **(No:02)** |
| | | vi. 24 Port 10/100 Mbps D-link switches **(No:02)** |
| | | vii. HP Laser jet 1020 Plus **(No:01)** |
| | | viii. 6 U Wall Mounted Rack**(No:01)** |
| | | ix. LCD Projector with Screen **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. R Studio, SQL Developer, |
| | | ii. Windows , EMU 86 |
| 6 | LAB-VI | **List of Major Equipment / Facilities** |
| | | i. HP 3330 Desktop, Intel Core i7, 8 GB RAM, 1 TB HDD, 18.5" LED Monitor, Keyboard and Monitor, **(No:29)** |
| | | ii. Dell OptiPlex 3050 MT Intel Core i7-7700- 7th gen processor, 16 GB RAM, 1 TB HDD, 18.5 LED Monitor, Keyboard, Mouse **(No:07)** |
| | | iii. 30 KVA UPS Online with ½ hour backup Sharing with lab4 & lab5 **(No:01)** |
| | | iv. Window Air Conditioners **(No:02)** |
| | | v. 24 Port 10/100 Mbps D-link switches **(No:02)** |

| | | |
|---|---|---|
| | | vi. HP Laser jet 1020 Plus **(No:01)** |
| | | vii. 6 U Wall Mounted Rack **(No:1)** |
| | | viii. LCD Projector with Screen **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. jupyter notebook, Cisco packet Tracker, Solidity, Remix IDE |
| | | ii. C++, Java, Kali linex , pfSence, Metasplote table |
| 7 | LAB-VII | **List of Major Equipment / Facilities** |
| | | i. Dell Optiplex 3050 MT Intel Core i7-7700- 7th gen processor, 16 GB RAM, 1 TB HDD, 18.5 LED Monitor, Keyboard, Mouse **(No:30)** |
| | | ii. Dell OptiPlex 3050 MT Intel Core i7-7700- 7th gen processor, 16 GB RAM, 1 TB HDD, 20 LED Monitor, Keyboard, Mouse **(No:06)** |
| | | iii. 30 KVA UPS Online with ½ hour backup Sharing with lab8 & lab9 **(No:01)** |
| | | iv. Window Air Conditioners **(No:02)** |
| | | v. 24 Port 10/100 Mbps D-link switches **(No:02)** |
| | | vi. HP Laser jet 1020 Plus **(No:01)** |
| | | vii. 6 U Wall Mounted Rack **(No:1)** |
| | | viii. LCD Projector with Screen **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Anaconda |
| | | ii. jupyter notebook |
| 8 | LAB-VIII | **List of Major Equipment / Facilities** |
| | | i. Dell Optiplex 3060 MT Intel Core i7 processor, 8 GB RAM, 1 TB HDD, 20" LED Monitor, Keyboard, Mouse**(No:63)** |
| | | ii. 30 KVA UPS Online with ½ hour backup Sharing with lab7 & lab9 **(No:01)** |
| | | iii. Split Air Conditioners **(No:03)** |
| | | iv. Window Air Conditioners **(No:01)** |
| | | v. HP Laser jet 1020 Plus**(No:01)** |
| | | vi. 24 Port 10/100 Mbps D-link switches **(No:02)** |
| | | vii. 16 Port 10/100 Mbps D-link switches **(No:02)** |
| | | viii. 12 U Wall Mounted Rack **(No:01)** |
| | | ix. 6 U Wall Mounted Rack **(No:01)** |
| | | x. LCD Projector with Screen **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Ubuntu 20 |
| | | ii. Python, Dev c++, Putty |

| | | |
|---|---|---|
| 9 | LAB-I<br>(CB Block) | **List of Major Equipment / Facilities** |
| | | i. DELL 3050 Desktop Intel Core i5, 16 GB RAM,1TB HDD, 20" LED Monitor, Keyboard and Mouse. **(No:72)** |
| | | ii. 40 KVA UPS Online with ½ hour backup **(No:01)** sharing with Lab Lab-11 |
| | | iii. Window Air Conditioners **(No:02)** |
| | | iv. 24 Port 10/100 Mbps D-link switches **(No:03)** |
| | | v. HP Laser jet 1020 Plus **(No:01)** |
| | | vi. 6 U Wall Mounted Rack **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Windows 10, C and C++, Java, Putty |
| 10 | LAB-II<br>(CB Block) | **List of Major Equipment / Facilities** |
| | | i. DELL 3050 Desktop Intel Core i5, 16 GB RAM,1TB HDD, 20" LED Monitor, Keyboard and Mouse. **(No:56)** |
| | | ii. 40 KVA UPS Online with ½ hour backup **(No:01)** sharing with Lab Lab-1 |
| | | iii. Window Air Conditioners **(No:02)** |
| | | iv. 24 Port 10/100 Mbps D-link switches **(No:04)** |
| | | v. HP Laser jet 1020 Plus **(No:01)** |
| | | vi. 6 U Wall Mounted Rack **(No:01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | ii. Windows 10, C and C++, Java, Putty |
| 11 | **SERVER ROOM** | HP ProLiantDL 380 Gen 10 Rack Server, Intel Xeon – 5115 (2* 2.5GHz/10-core/85w) Dual Processor kit, HPE 64GB (4x16GB)Dual Rack x 8 RAM DDR4-2666,3*1.5 TB HD 6 G SAS 10k rpm 12G SAS Modular Controller, 1GB 4-port network **(No:01)** |
| | | **Vmware Hypervisor-I (Bigbluebutton, Oracle 11g, Digihunt and Diginance Servers):** HP ProLiant DL 380 Gen 10 Rack Server, Intel Xeon – 5115 (2.4GHz /10-core/85w) FIo Processor kit, HPE 128GB (8x16GB) Dual Rack x 8DDR4-2666,5x300 GB 6 G SAS 10k rpm 12G SAS Modular Controller, 1GB 4-port network **(No:01)** |
| | | **Vmware Hypervisor-II (Digital Library, LMS and LMSdb Servers):** HP ProLiant DL 380 G9 Rack Server, Dual E5-2620V3 @2.4 GHz Processors, 2G 440Smart Array Controller, 32 GB RAM, 5*300 GB SAS HDD, DVD RW, 4*1Gigabit Ethernet Cards **(No:01)** |
| | | **Vmware Hypervisor-III (Old Web & Quick Heal Antivirus Servers and pfSense Firewall, ) :** HP ProLiant DL 380 G9 Rack Server, Dual E5-2620V3 @2.4 GHz Processors, 2G 440 Smart Array Controller,32 GB RAM, 5*300 GB SAS HDD, DVD RW,<br>4*1Gigabit Ethernet Cards **(No:01)** |
| | | **HP Blade Server (Bigbluebutton Server):**<br>Intel Xeon E5-2630v4 (2.2GHz/10-core /25MB/ 85W),Dual Processor, 64GB DDR3 RAM, 2.4TB HDD<br>etc., **(No:01)**<br><br>**HP Blade Server (LMS Server):**<br>Intel(R) Xeon(R) CPU E5-2640 v2 @ 2.00GHz (8 Cores)/25MB/ 85W) Dual Processor, 32GB DDR3RAM, 1.2TB HDD etc., **(No:01)** |

| | | |
|---|---|---|
| | | **LTSP Thin Client Server:** DELL Server Power edge T610 2S Server, IntelQuad Core E5506 xeon processor@2.15 GHz,PERC H700 Raid controller card, 16 GB DDR-2 ECC RAM, 4 MB Cache Memory, 4 x 300 GB SASHDD, DVD RW drive, Integrated Dual BroadcomGigabyte Ethernet card, 19" LCD Monitor. **(No:01)** |
| | | **Linux Server** DELL Server Power edge 2900 Intel Pentium –IV, 2 x 1.8 Ghz Quad Core xeon processor, PERC 5/I Raid controller card, 4 GB DDR-2 ECC RAM, 2x4 Cache Memory, 2 x 146 GB 15K RPM SAS HDD, DVD Combo drive, Integrated Dual Broadcom Gigabyte Ethernet card, 15" Color Monitor. **(No:01)** |
| | | **DHCP Server:** DELL Server Power edge 2900 Intel Pentium –IV, 2 x 1.8 Ghz Quad Core xeon processor, PERC 5/I Raid controller card, 4 GB DDR-2 ECC RAM, 2x4 Cache Memory, 2 x 146 GB 15K RPM SASHDD, DVD Combo drive, Integrated Dual Broadcom Gigabyte Ethernet card, 15" Color Monitor **(No:01)** |
| | | **Windows 2008 Server (Matlab):** DELL Server Poweredge 2900 Intel Pentium –IV, 2 x 1.8 Ghz Quad Core xeon processor, PERC 5/I Raid controller card, 4 GB DDR-2 ECC RAM, 2x4 Cache Memory, 2 x 146 GB 15K RPM SAS HDD, DVD Combo drive, Integrated Dual Broadcom Gigabyte Ethernet card, 15" Color Monitor **(No:01)** |
| | | **VMware V-Centre -** Dell Optiplex 3050 MT Intel Core i7-7700- 7th gen processor, 16 GB RAM, 1 TBHDD, 18.5 LED Monitor **(No:01)** |
| | | **LMS (Moodle)** HP 400-G Desktop Intel Core i5/4570 Processor, 8 GB RAM, 1 TB HDD, 18.5" LED Monitor,Keyboard and mouse **(No:02)** |
| | | HP 3330 Desktop, Intel Core i7, 8 GB RAM, 1 TBHDD, 18.5" LED Monitor, Keyboard and Monitor, **(No:01)** |
| | | HP Pro 3330 i3 Processor, 4 GB RAM, 500 GB HDD, 20" led monitor, Keyboard, Mouse **(No:05)** |
| | | HP Elite 7100 MT, Intel core i3 550 @ 3.2GHz, 2 GBRAM, 320 GB HDD, 18.5'' TFT Color Monitor, Keyboard and mouse **(No:01)** |
| | | Dell i5, 8GB RAM, 1 TB HDD, 18.5" Monitor, KeyBoard, Mouse **(No:01)** |
| | | HP i5, 8GB RAM, 1 TB HDD, 18.5" Monitor, Key Board, Mouse **(No:01)** |
| | | Laptop Dell Vostro 3560, Core i5 Processor, 8 GBRAM, 1 TB HDD, with DOS. **(No:02)** |
| | | CISCO Router 1900 Series **(No:01)** |
| | | Cisco MX100 Firewall **(No:01)** |
| | | 28 Port CISCO SG-350 Gigabit Switch **(No:04)** |
| | | Netgate 1537 MAX pfSence + Security Gateway (**No:01**) |
| | | Ubiquite 24 Port 1 Gig Switch (**No:01**) |
| | | HP Lasejet MFP M1005 Printer **(No:01)** |
| | | HP Laser jet 1020 Plus Printer **(No:01)** |
| | | 42 U Rack for Switches **(No:01)** |
| | | 8 Port KVM Switch **(No:01)** |
| | | Netrack Servers Rack **(No:01)** |
| | | Air conditioner 3.5 Tones **(No:02)** |
| | | 10 KVA Online UPS 5 hours Backup Techser make **(No:01)** |

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
# HYDERABAD - 500 075

### LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: AI&ML**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | LAB-11 (DBS, IWT, MFDS) | **List of Major Equipment / Facilities** |
| | | i. HP, Intel(R) Core(TM) i5-10500 CPU @ 3.10GHz, 16.0 GB RAM, 1 TB HDD and 20″ LED Monitor, Keyboard and Mouse. **(No: 36)** |
| | | ii. 10 KVA UPS Online with ½ hour backup: HS11-10 CM Model. **(No: 01)** |
| | | iii. Window Air Conditioners **(No: 01)** |
| | | iv. D-Link (10/100 Switch) DES-1024A, 24 Port **(No: 01)** |
| | | v. CISCO Switch (SG300-28) 28 Port **(No: 01)** |
| | | vi. 6U Wall Mounted Rack. **(No: 01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Java, SQL Developer,, Python, Dev C++ |
| | | ii. Visual Studio |
| 2 | LAB-12 (IWT & DAA) | **List of Major Equipment / Facilities** |
| | | i. HP, Intel(R) Core(TM) i5-10500 CPU @ 3.10GHz, 16.0 GB RAM, 1 TB HDD and 20″ LED Monitor, Keyboard and Mouse. **(No: 30)** |
| | | ii. 10 KVA UPS Online with ½ hour backup: HS11-10 CM Model. **(No: 01)** |
| | | iii. D-Link (10/100 Switch) DES-1024A, 24 Port **(No: 01)** |
| | | iv. CISCO Switch (SG300-28) 28 Port **(No: 01)** |
| | | v. HP Laser 108 W Printer **(No: 01)** |
| | | vi. 6U Wall Mounted Rack. **(No: 01)** |
| | | vii. LCD Projector with Screen **(No: 01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | iii. Java, ,Python, Dev C++ |
| | | iv. Visual Studio |

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
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### LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: Computer Engineering and Technology**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | Lab –I (Internet of Things Lab) | **List of Major Equipment / Facilities** |
| | | i. Dell Optiplex 3060 MT Intel Core i7 processor, 16 GB RAM, 1 TB HDD, 20" LED Monitor, Keyboard, Mouse **(No: 25)** |
| | | ii. Dell Intel core i5, 8 GB RAM, 1 TB HDD, 20'' LED Monitor, Keyboard and mouse **(No: 01)** |
| | | iii. HP Pro Desk 400 G7 MT, Intel Core i5-10500 CPU@3.10 GHz x64-based processor, Intel @HD Graphics 4600, 16 GB RAM, 1 TB HDD, 20'' LED Monitor, Keyboard and Mouse **(No: 10)** |
| | | iv. 30 KVA UPS Online with ½ hour backup. **(No: 01)** |
| | | v. 24 Port 10/100 Mbps D-link switches **(No: 02)** |
| | | vi. 6U Wall Mounted Rack-1 **(No: 01)** |
| | | vii. LCD Projector with Screen-1 **(No: 01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Ubuntu 22.04, Java, Oracle, Python, Dev C++ |
| | | ii. Android Studio, Visual Studio |
| 2 | Lab-II (Cyber Security Lab) | **List of Major Equipment / Facilities** |
| | | i. HP, Intel(R) Core(TM) i5-10500 CPU @ 3.10GHz, 16.0 GB RAM, 1 TB HDD and 20″ LED Monitor, Keyboard and Mouse. **(No: 36)** |
| | | ii. 10 KVA UPS Online with ½ hour backup: HS11-10 CM Model. **(No: 01)** |
| | | iii. Window Air Conditioners **(No: 02)** |
| | | iv. D-Link (10/100 Switch) DES-1024A, 24 Port **(No: 01)** |
| | | v. CISCO Switch (SG300-28) 28 Port **(No: 01)** |
| | | vi. HP Laser Jet 1020 plus Printer **(No: 01)** |
| | | vii. 6U Wall Mounted Rack. **(No: 01)** |
| | | viii. LCD Projector with Screen **(No: 01)** |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. SQL Developer, MongoDB, MAT Lab |
| | | ii. Visual Studio, Python, Dev C++ |

**CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)**
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**LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP**

# Name of the Department: Information Technology

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | IT LAB-1 | **List of Major Equipment / Facilities** |
| | | i) **Dell Optiplex 3060** i7/8/1/1TB/ 20"LCD Monitor - (**No:-28)** |
| | | ii) **HP 400G2** Desktop Core i7-4770/3 4GHz/8 GB RAM /1TB HDD/DVD-RW/DOS/3-3-3, HPLV1911 18.5" Black Lit monitor - (**No-04)** |
| | | iii) **Raspberry Pi3 kits** - 20 no.with different sensors. (smoke, Gas, Soil Moisture, Rain, Pressure, Temperature, ultrasonic sensor ) **(No: 20)** |
| | | iv) **Embedded 8051** Microcontroller 89E516RD (Flash Programmable Development Board (URD4)) **(No: 15)** |
| | | v) LCD Projector |
| | | vi) Two Air conditioners |
| | | vii) 30 KVA Cyber UPS with batteries |
| | | viii) Network Switch: 24 Port switch with batteries |
| | | ix) HP Laser Jet Printer (**No:01**) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Softwares: Keil Compiler, SST FlashFlex 5, |
| | | ii) Raspbian OS |
| | | iii) Open Source Eclipse IDE |
| 2 | IT LAB-2 | **List of Major Equipment / Facilities** |
| | | i) **Dell Optiplex 3060** i7/8/1/1TB/20"/LCD Monitor **(No: 27)** |
| | | ii) **HP 400G2** Desktop Core i7-4770/3 4GHz/8 GB RAM /1TB HDD/DVD-RW/DOS/3-3-3, HPLV1911 18.5" Black Lit monitor **(No: 5)** |
| | | iii) LCD Projector |
| | | iv) Two Air conditioners |
| | | v) Network Switch: 24 Port switch with batteries |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Softwares: Keil Compiler, SST FlashFlex 5 |
| | | ii) Raspbian OS |
| | | iii) Sql Developer for DBMS Lab. |
| 3 | IT LAB-3 | **List of Major Equipment / Facilities** |
| | | i) **Dell Optiplex 3060** i7/8/1/1TB/20"/W10/3YW **(No:24 )** |
| | | ii) **HP 400G2** Desktop Core i7-4770/3 4GHz/8 GB RAM /1TB HDD/DVD-RW/DOS/3-3-3, HPLV1911 18.5" Black Lit monitor **(No: 1)** |
| | | iii) **HP 3330 Desktop** Core i7-3770/ 8 GB RAM / 1TB HDD/ DVD-RW/DOS/3-3-3, HPLV1911 18.5" LED/LCD monitor **(No: 7)** |
| | | iv) **HP 400 G7 Desktop** Core i5-10500/16 GB/1 TB/18.5’ LCD Monitor USB KB& Mouse **(No: 1)** |
| | | v) HP Laser Jet Printer (**No:01**) |
| | | vi) LCD Projector |
| | | vii) Two Air conditioners |

| | | |
|---|---|---|
| | | viii) Network Switch: 24 Port switch with batteries |
| | | **List of Experimental Setup in each Laboratory** |
| | | i)Open Source Eclipse IDE |
| **4** | **IT LAB-4** | **List of Major Equipment / Facilities** |
| | | i) **Dell Optiplex 3050** i7-7700/16GB/1TB HDD/18.5"/LED Monitor **(No: 21)** |
| | | ii) **Dell Optiplex 3060** i7/8/1/1TB/20"/W10/3YW **(No:6)** |
| | | iii) **HP 3330 Desktop** Core i7-3770/ 8 GB RAM / 1TB HDD/ DVD-RW/DOS/3-3-3, HPLV1911 18.5" LED/LCD monitor **(No: 02)** |
| | | iv) **HP 400G2 Desktop** Core i7-4770/3 4GHz/8 GB RAM /1TB HDD/DVD-RW/DOS/3-3-3, HPLV1911 18.5" Black Lit monitor **(No: 02)** |
| | | v)**HP Server**: Intel Quad Core Xeon E 2x6 MB Cache, 8 GB DDR 2, 667 MHz ECC RAM, 3x146GB Hard Disk (SAS), RAID 5 controller ;.**(No:01)** |
| | | vi) **Dell Power Edge T610** (FTP SERVER) (Intel Quad Core Xeon,16GB Ram,4x300 Gb HDD,19 LCD Monitor ) **(No: 01)** |
| | | vii) LCD Projector |
| | | viii) Two Air conditioners |
| | | ix) Network Switch: 24 Port switch with batteries |
| | | x) UPS – 10 KVA |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Open Source Software (Anaconda Navigator/Python) |
| **5** | **IT LAB-5** | **List of Major Equipment / Facilities** |
| | | i) **Dell OptiPlex 3050 MT** i7 Model/ Intel Core i7-7700 3.6GHz 7th Gen. Processor, 16GB RAM, 1TB HDD 7200 RPM SATA, 18.5"LCD Monitor **(No:26)** |
| | | ii) **HP ProDesk 400 G7**-Core i5-10500/16 GB RAM /1TB HDD/18.5' LCD Monitor **(No: 05)** |
| | | iii) **HP 3330 Desktop** Core i7-3770/ 8 GB RAM / 1TB HDD/ DVD-RW/DOS/3-3-3, HPLV1911 18.5" LED/LCD monitor **(No: 02)** |
| | | iv) LCD Projector |
| | | v) Two Air conditioners |
| | | vi) Network Switch: 24 Port switch with batteries |
| | | vii) UPS – 10 KVA |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Open Source Linux / Ubuntu Operating System Software |
| | | ii) Open Source Eclipse IDE |
| **6** | **IT LAB-6** | **List of Major Equipment / Facilities** |
| | | i) **HP 400 G7 Desktop** Core i5-10500/16 GB/1 TB/18.5' LCD Monitor USB KB& Mouse **(No: 30)** |
| | | ii) **HP 3330 Desktop** Core i7-3770/ 8 GB RAM / 1TB HDD/ DVD-RW/DOS/3-3-3, HPLV1911 18.5" LED/LCD monitor **(No: 03)** |
| | | iii) HP Laser Jet Printer (**No:01**) |
| | | iv) LCD Projector |
| | | v) two Air conditioners |
| | | vi) Network Switch: 24 Port switch with batteries |
| | | vii) UPS – 10 KVA |
| | | **List of Experimental Setup in each Laboratory** |
| | | i)Open Source Software(Anaconda Navigator/Python) |

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**HYDERABAD - 500 075**

**LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP**

# Name of the Department: Artificial Intelligence & Data Science

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | IT LAB-6 | **List of Major Equipment / Facilities** |
| | | i) **HP 400 G7 Desktop** Core i5-10500/16 GB/1 TB/18.5' LCD Monitor USB KB& Mouse **(No: 30)** |
| | | ii) **HP 3330 Desktop** Core i7-3770/ 8 GB RAM / 1TB HDD/ DVD-RW/DOS/3-3-3, HPLV1911 18.5" LED/LCD monitor **(No: 03)** |
| | | iii) LCD Projector |
| | | iv) Two Air conditioners |
| | | v) Network Switch: 24 Port switch with batteries |
| | | vi) UPS – 10 KVA |
| | | **List of Experimental Setup in each Laboratory** |
| | | **i) Operating Systems:** Ubuntu 18.04, Windows 10 |
| | | ii ) **Languages:** C, C++, JDK 1.8 |
| | | iii) **Open Source Software** : Anaconda Navigator/Python |
| | | iv) **Applications:** Putty, MS Office 2010 |
| 2 | TPO Lab 4 | **List of Major Equipment / Facilities** |
| | | i) **Dell OptiPlex 3050 MT** i7 Model/ Intel Core i7-7700 3.6GHz 7th Gen. Processor, 16GB RAM, 1TB HDD 7200 RPM SATA, 18.5"LCD Monitor **(No:54)** |
| | | ii) Two LCD Projectors |
| | | v) Two Air conditioners |
| | | vi) Network Switch: 24 Port switch with batteries |
| | | **List of Experimental Setup in each Laboratory** |
| | | **i) Operating Systems:** Windows 10 |
| | | ii ) **Languages:** C, C++, JDK 1.8 |
| | | iii) **Open Source Software** : Anaconda Navigator / Python |
| | | iv) **Applications:** Putty, MS Office 2010 |

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**LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP**

## Name of the Department: CHEMICAL ENGINEERING

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | **Mass Transfer Operations Laboratory** | **List of Major Equipment /Experimental Set up/ Facilities** |
| | | i)Diffusion in $CCl_4$ equipment |
| | | ii)Wetted wall column |
| | | iii)Drying equipment |
| | | iv)Packed bed Distillation column |
| | | v)Steam Distillation Unit |
| | | vi)VLE Unit |
| | | vii)Simple distillation unit |
| | | viii) Crystallization unit |
| | | ix) Solid –Liquid Extraction unit |
| | | x)Liquid –Liquid Extraction unit |
| 2 | **Process Dynamics and Control Laboratory** | **List of Major Equipment /Experimental Set up/ Facilities** |
| | | i) Two Tank interacting System |
| | | ii) Level Control Trainer |
| | | iii) Flow Control Trainer |
| | | iv) Temperature Control Trainer |
| | | v) Pressure Control Trainer |
| | | vi) First and Second Order System |
| 3 | **Heat Transfer Laboratory** | **List of Major Equipment /Experimental Set up/ Facilities** |
| | | i) Stefan Boltzmann Apparatus |
| | | ii)Emissivity Measurement Apparatus |
| | | iii) Composite Wall |
| | | iv) Lagged Pipe Apparatus |
| | | v) Pin-Fin Apparatus |
| | | vi) Heat Exchanger |
| | | vii)Critical Heat Flux Apparatus |
| | | viii) Thermal Conductivity of Insulating Powder |

| | | |
|---|---|---|
| 4 | **Process Modeling and Simulation Laboratory** | **List of Major Equipment /Experimental Set up/ Facilities** |
| | | i) Desktop computers 30 nos |
| | | ii) MATLAB – Institute Licensed software |
| | | iii) aspenONE – licensed simulation software(UniversityVersion) |
| 5 | **Chemical Reaction Engineering Laboratory** | **List of Major Equipment /Experimental Set up/ Facilities** |
| | | i) Plug flow reactor in series with CSTR |
| | | ii) Packed Bed Reactor |
| | | iii) CSTRs in Series |
| | | iv) Adiabatic Batch Reactor |
| | | v) Non ideal Plug Flow Reactor |
| | | vi) Non ideal Packed Bed Reactor |
| | | vii) Batch reactor |
| | | viii) Solid-Liquid reactor |
| | | ix) Liquid-Liquid reactor |
| 6 | **Mechanical Unit Operations Laboratory** | **List of Major Equipment /Experimental Set up/ Facilities** |
| | | i) Jaw Crusher |
| | | ii) Roll Crusher |
| | | iii) Pulverizer |
| | | iv) Ball Mill |
| | | v) Cyclone separator |
| | | vi) Drop Weight Crusher |
| | | vii) Vibrating Screen |
| | | viii) Plate and frame filter press |
| | | ix) Sieve shaker |
| | | x) Weighing balance |
| | | xi) Set of sieves |
| | | xii) Batch Sedimentation unit |

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## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: BIOTECHNOLOGY**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | **BIOCHEMISTRY LAB** | **List of Major Equipment / Facilities** |
| | | i. Colorimeter |
| | | ii. Analytical balance |
| | | iii. pH Meter |
| | | iv. Water bath |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Introduction to Biochemistry Lab: Units, Volume / Weight measurements, concentration units |
| | | ii. Preparation of Solutions – percentage solutions, molar solutions, normal solutions and dilution of stock solution |
| | | iii. Measurement of pH |
| | | iv. Preparation of buffers and reagents |
| | | v. Estimation of sugars from the given sample by DNS method |
| | | vi. Estimation of Carbohydrates by Anthrone method |
| | | vii. Estimation of Amino acids by Ninhydrin method |
| | | viii. Estimation of Proteins by Biuret method |
| | | ix. Estimation of Proteins by Lowry method |
| | | x. Determination of Acid value, Saponification value and Iodine Number of Fat |
| | | xi. Estimation of Cholesterol by Liebermann Burchard method |
| | | xii. Estimation of DNA by Diphenylamine method |
| | | xiii. Estimation of RNA by Orcinol method |
| 2 | **MICROBIOLOGY LAB** | **List of Major Equipment / Facilities** |
| | | i. Autoclave (vertical) |
| | | ii. Laminar Airflow (Horizontal) |
| | | iii. Biological Compound Microscope |
| | | iv. Binocular Compound Light Microscope |
| | | v. Orbital shaking incubator |
| | | vi. Refrigerator |
| | | vii. Binocular Compound Light Microscope |
| | | viii. Rotary Shaker |

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|---|---|---|---|
| | | **List of Experimental Setup in each Laboratory** | |
| | | i. | Calibration of Microscope and Measurement of Microorganisms-Micrometer. |
| | | ii. | Staining and Identification of microorganism: (a) Simple and Differential staining techniques. |
| | | iii. | Sterilization techniques (Autoclaving, Hot Air Oven, Radiation and Filtration). |
| | | iv. | Preparation of culture media (a) broth type of media (b) Agar. |
| | | v. | Culturing of microorganism (a) broth (b) pure culture techniques- Streak plate, Pourplate. |
| | | vi. | Antibiotic tests- Disc diffusion method, minimum inhibitory concentration. |
| | | vii. | Biochemical tests- IMIVC test, Catalase, Coagulase test, Gelatinase test, Oxidase |
| | | viii. | Factors affecting the bacterial growth and study of the growth curve. |
| | | ix. | Measurement of Microbial Growth by Turbidometry and enumeration of bacterial numbers by serial dilution. |
| | | x. | Measurement of Microbial Growth by Viable Count |
| | | xi. | Production of Beer and Wine |
| | | xii. | Coliform test |
| **3** | **IMMUNOLOGY LAB** | **List of Major Equipment / Facilities** | |
| | | i. | Microcentrifuge digital timer |
| | | ii. | Immunoelectrophoresis with power pack |
| | | iii. | Micropipettes |
| | | **List of Experimental Setup in each Laboratory** | |
| | | i. | ABO Blood Grouping and Identification of Rh typing |
| | | ii. | Rocket Immunoelectrophoresis |
| | | iii. | Ouchterlony Double Diffusion for Antigen-Antibody Patterns (ODD) |
| | | iv. | Immuno-electrophoresis (IEP) |
| | | v. | Radial Immune Diffusion test (RID) |
| | | vi. | Widal test |
| | | vii. | VDRL tests |
| | | viii. | Total and Differential count of RBC & WBC by Micropipette method |
| | | ix. | Erythrocyte sedimentation rate |
| | | x. | Enzyme-Linked Immunosorbent Assay (ELISA) for Antigen capture and Antibody capture. |

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|---|---|---|
| | | xi. Estimation of Immunoglobulins by Precipitation with Saturated Ammonium Sulphate |
| **4** | **INSTRUMENTATION LAB** | **List of Major Equipment / Facilities** |
| | | i. UV-Visible spectrophotometer |
| | | ii. Digital photo Fluorometer |
| | | iii. Distillation Unit |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. The calibration of pH meter and measurement of pH for different solutions |
| | | ii. Estimation of Ascorbic acid by colorimetric assay |
| | | iii. Estimation of unknown samples by using a conductivity meter |
| | | iv. Estimation of different macromolecules by visible spectrophotometer |
| | | v. Verification of Lambert - Beers law by UV –Visible spectrophotometer |
| | | vi. Estimation of proteins and nucleic acids by UV method |
| | | vii. Estimation of turbidity using Nephelometer |
| | | viii. The separation of different macromolecules by Thin layer chromatography |
| | | ix. The separation of different macromolecules by paper chromatography |
| | | x. The separation of different macromolecules by SDS-PAGE |
| | | xi. Estimation of minerals by Flame photometry |
| | | xii. Estimation of Thiamine and Riboflavin by Fluorimetry |
| | | xiii. Preparation of Standard curve using UV-VIS & Flame Photometry |
| | | xiv. Fractionation of Plasma Proteins by Electrophoresis |
| | | xv. Membrane protein extraction by differential centrifugation |
| **5** | **BIOPROCESS ENGINEERING LAB** | **List of Major Equipment / Facilities** |
| | | i. Orbital shake incubator |
| | | ii. Fluid bed Reactor |
| | | iii. Packed bed reactor |
| | | iv. Probe Sonicator |
| | | v. Laminar Airflow (Horizontal) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Study of rheological parameters in the fermentation broth. |
| | | ii. Study of batch and fed-batch fermentation processes. |

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|---|---|---|
| | | iii. Estimation of Specific growth rate and doubling time of microorganisms. |
| | | iv. Estimation of Monod parameters and determine the growth kinetics |
| | | v. Bioreactor instrumentation and its control. |
| | | vi. Study of enzyme immobilization and determine its activity |
| | | vii. Media optimization by using Plackett-Burman design |
| | | viii. Production of citric acid by *Aspergillus niger* and its estimation by the titrimetric method. |
| | | ix. Substrate utilization and product formation kinetics. |
| | | x. Determination of KLa by Sulphite oxidation method. |
| **6** | **ENZYME TECHNOLOGY LAB** | **List of Major Equipment / Facilities** |
| | | i. Double Beam UV -Visible Spectrophotometer |
| | | ii. Hot air oven |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Preparation of buffers |
| | | ii. Isolation and extraction of enzymes (Microbial, plant and animal source). |
| | | iii. Effect of pH on enzyme activity. |
| | | iv. Effect of temperature on enzyme activity. |
| | | v. Effect of substrate concentration on enzyme activity. |
| | | vi. Effect of time interval on enzyme activity. |
| | | vii. Development of Enzyme Assay. |
| | | viii. Evaluation of Michaelis-Menten kinetic parameters. |
| | | ix. Kinetic studies of enzyme inhibition |
| | | x. Determination of growth curve of a supplied microorganism and to determine substrate degradation profile. |
| | | xi. Studies on immobilization of enzyme/cell by gel entrapment method |
| | | xii. Comparative study of activities of free and immobilized enzyme systems. |
| **7** | **GENETIC ENGINEERING LAB** | **List of Major Equipment / Facilities** |
| | | i. Gel-Documentation system |
| | | ii. Incubator |
| | | iii. Microcentrifuge with digital timer |
| | | iv. Refrigerated high-speed centrifuge |
| | | v. UV Transilluminator |
| | | vi. PCR- Master cycler |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Isolation of genomic DNA |
| | | ii. Isolation of plasmid DNA |

| | | |
|---|---|---|
| | | iii. Visualization of Genomic and Plasmid DNA on Agarose gels |
| | | iv. Restriction digestion |
| | | v. Restriction mapping |
| | | vi. Gel elution. |
| | | vii. DNA ligation |
| | | viii. Preparation of competent cells. |
| | | ix. Genetic transformation and screening for recombinant bacterial cells. |
| | | x. Blotting techniques- southern blotting |
| | | xi. Amplification of DNA fragments by Polymerase Chain Reaction |
| | | xii. DNA sequencing- Sanger's Method |
| | | xiii. Analysis of Recombinant Proteins using SDS-PAGE |
| **8** | **FERMENTATION TECHNOLOGY LAB** | **List of Major Equipment / Facilities** |
| | | i. Laminar Airflow (Horizontal) |
| | | ii. Rotary Vacuum Film Evaporator |
| | | **List of Experimental Setup in each Laboratory** |
| | | r instrumentation and control. |
| | | of microorganisms from soil or water samples for ially useful ended experiments |
| | | on of Media and measuring viscosity |
| | | ion of Media and Air. |
| | | n of specific growth rate and doubling time of a anism |
| | | f E.coli using Batch fermentation technique |
| | | f E.coli using Fed-batch culture techniques. |
| | | tion of citric acid production from A.niger using Plackett- nethod |
| | | n of biomass (dry weight), substrate and product analysis post l fermentation. |
| | | n of Monod parameters for determining growth kinetics |
| | | on of Lactic acid by using a batch reactor |
| **9** | **BIOINFORMATICS LAB** | **List of Major Equipment / Facilities** |
| | | i. Computers HP ProDesk 400G7 MicroTowerPC(8CORE 16 MB Cache)(20 no.) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Searching Bibliographic databases for relevant information |
| | | ii. Sequence retrieval from DNA and protein databases. |
| | | iii. BLAST services. |
| | | iv. FASTA services. |
| | | v. Pair-wise comparison of sequences (Local and global alignment). |

| | | |
|---|---|---|
| | | vi. Multiple Sequence Alignment. |
| | | vii. Evolutionary studies/Phylogenetic Analysis. |
| | | viii. Protein Databank retrieval and visualization. |
| | | ix. Structure Exploration of Proteins. |
| | | x. Restriction Mapping |
| | | xi. Identification of Genes in Genomes |
| | | xii. NCBI ORF Finder |
| | | xiii. Primer Design |
| **10** | **DOWNSTREAM PROCESSING LAB** | **List of Major Equipment / Facilities** |
| | | i. Centrifuge |
| | | ii. Deep Freezer |
| | | iii. Incubator |
| | | iv. Rotary Vacuum Evaporator |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Cell Disruption of microorganism using an enzymatic method. |
| | | ii. Cell Disruption of plant cells/animal cells using physical methods. |
| | | iii. Liquid-liquid extraction. |
| | | iv. Separation of solids from a liquid by Sedimentation. |
| | | v. Separation of microorganisms from fermentation broth by Microfiltration. |
| | | vi. Separation of solute particles by Dialysis. |
| | | vii. Separation of protein by Ammonium Sulphate precipitation |
| | | viii. Isolation and quantification of protein from milk by Isoelectric Precipitation. |
| | | ix. Separation of biomolecules by Gel Exclusion Chromatography |
| | | x. Purification of lysozyme from chicken egg white extract by Ion Exchange Chromatography. |
| | | xi. Purification of proteins by Affinity Chromatography. |
| | | xii. Simple distillation- vapor-liquid equilibrium |
| | | xiii. Solid-liquid extraction. /Drying technique |
| | | xiv. Alpha-amylase activity |
| **11** | **TISSUE CULTURE LAB** | **List of Major Equipment / Facilities** |
| | | i. Autoclave |
| | | ii. Benchtop Orbital shaking Incubator |
| | | iii. Double Distillation Unit |
| | | iv. Digital weighing Balance |
| | | v. Hot air oven |
| | | vi. Laminar Airflow(Vertical) |
| | | vii. Laminar Airflow (Horizontal) |
| | | viii. Microscope Inverted |

| | | |
|---|---|---|
| | | ix. Refrigerator |
| | | x. Inverted LED Microscope including Mac CAM DC-5 |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Preparation of Plant tissue Culture Media<br>• Preparation of MS stock solutions<br>• Preparation of MS callus induction media |
| | | ii. Surface sterilization |
| | | iii. Callus induction from mature embryo |
| | | iv. Cell suspension cultures initiation and establishment |
| | | v. Organogenesis and Embryogenesis |
| | | vi. Meristem tip culture for production of virus-free plants |
| | | vii. Micropropagation of horticultural/medicinally important plants |
| | | viii. Root induction and acclimatization of *in vitro* plantlets |
| | | ix. Production of synthetic seeds |
| | | x. Protoplast isolation |
| | | xi. Agrobacterium-mediated gene transfer: induction of Hairy roots |
| **12** | **ANIMAL BIOTECHNOLOGY LAB** | **List of Major Equipment / Facilities** |
| | | i. Bench Centrifuge |
| | | ii. CO2 Incubator with cylinder |
| | | iii. Micro plate Elisa reader |
| | | iv. Biosafety Cabinet |
| | | v. Refrigerator |
| | | **List of Experimental Setup in each Laboratory** |
| | | i. Microscopic visualization of Human Buccal Epithelial cells |
| | | ii. Separation of serum from whole blood |
| | | iii. Preparation of cell culture growth media |
| | | iv. Primary culture of chicken embryo fibroblast culture |
| | | v. Isolation of Hepatocytes from Chicken liver cells |
| | | vi. Enumeration and counting of animal cells using a Haemocytomete |
| | | vii. Staining and microscopic visualization of adherent animal cells |
| | | viii. Evaluation of cell viability/cytotoxicity in animal cells |
| | | ix. Cell viability of cells using trypan blue dye |
| | | x. Trypsinization or subculture of the adherent cell line |

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
# HYDERABAD - 500 075
## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: MCA**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | MCA LAB - I | **List of Major Equipment / Facilities** |
| | | **i) hardware**<br>a) HP 3330 Desktop Core i5-34701, 8GB RAM, I TB HDD, GRAPHIC Card, TFT Color Monitor, DVD RW, 10/100/1000 Mbps Ethernet Card, Keyboard and mouse. – 30Nos.<br>b) HP – 280 GB Desktop, Core i7, Model No: 11700, 16GB/256 GB SSD, HP P204 V 19.5" Monitor – 05 Nos |
| | | ii) N**etwork accessories and peripherals**<br>a) 24 Port D Link Switch -02<br>b) HP LaserJet 1005 – 01<br>c) 6-U Communication Rack -01<br>d) HP 3 in one printer cum scanner cum Xerox machine<br>e) HP Laser jet P1007 - 01 |
| | | **iii)Electrical equipment**<br>a) Cassette Air conditioners -02<br>b) Ceiling fans -04<br>c) Panasonic LCD Projector -01 |
| | | **List of experimental setup in each laboratory** |
| | | i) Computer Programming Lab using 'C', ii) Data Structures Lab using C++, iii) Database Management Systems Lab, iv) Machine Learning Lab using Python, v) Web Technologies Lab |
| 2 | MCA LAB - II | **List of Major Equipment / Facilities** |
| | | **i)Hardware:**<br>a) HP Elite 7100 Desktop Intel Core i3-500 Processor 2 GB RAM 320 GB HDD, DVDs, 18.5" TFT Monitor – 15 Nos.<br>b) HP Elite 7100 Desktop, Intel core i3-500 Processor, 2GB RAM, 320GB HDD, DVDs, 17.5" TFT Monitor – 06 Nos.<br>c) K4Q81AV-HP 400G2 Desktop core 17-4770/3, 64ghz / 890/1 TB/DVD RW, USB/KB and mouse/005/333 G9/W86AA-HP V193, LED 18.5" Monitor – 15 Nos<br>d) HP – 280 GB Desktop, Core i7, Model No: 11700, 16GB/256 GB SSD, HP P204 V 19.5" Monitor – 05 Nos |
| | | ii) **Network Accessories And Peripherals**<br>a) 24 Port D Link 10/100 Switch -02,<br>b) HP Laser jet P1020 plus printer-01,<br>c) 6-U Communication Rack -01 |
| | | iii) **Electrical equipment**<br>a) Cassette Air conditioners – 02,<br>b) 10KVA CONSUL UPS with half an hour backup -01 (for Lab-I & II),<br>c) Panasonic LCD Projector-01,<br>d) Voltas Water Dispenser -01 (for Staff and Students of MCA Dept.) |
| | | **List of Experimental Setup in each laboratory** |
| | | i) Python Programming Lab, ii) Object Oriented Programming Lab using Java, iii) Database Management Systems Lab, iv) Object Oriented System Development Lab, v) Web Technologies Lab |

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
# HYDERABAD - 500 075

## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: MBA**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | Lab 1 & 2 (Computer Lab) | **List of Major Equipment / Facilities** |
| | | i) 60 Computers (30 each) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Statistical Lab. |

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## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: PHYSICS**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | **Radiation Assessment Lab** | **List of Major Equipment / Facilities** |
| | | SSNTD etching unit |
| | | Spark Counter |
| | | GM Counter |
| | | Micro-R-Survey meter |
| 2 | **Functional Materials Lab** | High Temperature Box Furnace |
| | | Hydraulic Press |
| | | Spray Pyrolysis |
| | | Analytical Balance (0.1 mg readability) |
| | | Magnetic stirrer with hot plate |
| 3 | **Physics Lab-1 (Physics Lab)** | **List of Major Experimental Setup** |
| | | -Nil- |
| | | **List of Experimental Setup** |
| | | Young's Modulus |
| | | Ultrasonic Interferometer |
| | | Helmholtz Resonator |
| | | Compound Pendulum |
| | | Viscosity-Lamp & Scale |
| | | Fly Wheel |
| | | Torsional pendulum |
| | | Sonometer |
| | | Melde's Experiment |
| | | Coupled Oscillator |
| 4 | **Physics Lab- 2 (Optics Lab)** | **List of Major Experimental Setup** |
| | | -Nil- |
| | | **List of Experimental Setup** |
| | | Single Slit Expt. |
| | | Double Sit Expt. |
| | | Fiber Optics |
| | | Laser Expt. |
| | | Polarimeter |
| | | Grating |
| | | Malus's Law |
| | | Fresnel’s Biprism |
| | | R.P.Telescope |
| | | Double Refraction |
| | | Newton’s Rings |

| | | |
|---|---|---|
| **5** | **Physics Lab -3 (Electricity & Magnetism Lab)** | **List of Major Experimental Setup** |
| | | -Nil- |
| | | **List of Experimental Setup** |
| | | LCR Circuit |
| | | M & H Values |
| | | B-H Curve |
| | | Thermo Electric Power |
| | | e/m of an Electron |
| | | Planck's Constant |
| | | Dielectric Constant |
| **6** | **Physics Lab -4 (Semiconductor Physics lab)** | **List of Major Experimental Setup** |
| | | Hall Effect |
| | | **List of Experimental Setup** |
| | | Thermister |
| | | LED Characteristics |
| | | Solar Cell |
| | | P-N Junction Diode |
| | | Energy Gap |

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## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: CHEMISTRY**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | Lab-I Instrumentation& Volumetric | **List of Major Equipment / Facilities** |
| | | i) Potentiometers and Magnetic Stirrers / Power connection and laboratory tables to perform the experiment. |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Potentiometers (14), Magnetic Stirrers (11), Digital weighing machine(01) |
| | | ii) Saturated calomel and Platinum electrodes (28) |
| | | iii) Quinhydrone Powder |
| | | iv) Oxalic acid, Mohr's salt, Oxalic acid, $KMnO_4$, $H_2SO_4$, KCl , Distilled Water, NaOH, Phenolphthalein |
| | | v) Burettes, Conical Flasks, Pipettes, Measuring Jars, Standard Flasks, Beakers |
| | | vi) Magnetic stirrers, Magnetic Beads, Salt Bridge |
| 2 | Lab-II Instrumentation | **List of Major Equipment / Facilities** |
| | | i)Conductometers / Power connection and laboratory tables to perform the experiment. |
| | | **List of Experimental Setup in each Laboratory** |
| | | i)Conductometers(14) |
| | | ii) Conductivity cell (14), Digital weighing machine(01) |
| | | iii) Oxalic acid, NaOH, Distilled Water, HCI, Acetic Acid, Phenolphthalein |
| | | iv) Burettes, Conical Flasks, Pipettes, Measuring Jars, Standard Flasks, Beakers, Glass Rod, |
| 3 | Lab-III Volumetric | **List of Major Equipment / Facilities** |
| | | i) Water Bath, Hot Plate /Power connection and laboratory tables to perform the experiment. |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) Water Bath(02), Hot Plate(01), Digital weighing machine(01) |
| | | ii) Oxalic Acid, HCI, NaOH, Phenolphthalein, Methyl Acetate, KI,$K_2S_2O_8$, $Na_2S_2O_3$, Starch, Acetic acid |
| | | iii) Burettes, Conical Flasks, Pipettes, Measuring Jars, Standard Flasks, Beakers, |
| 4 | Lab-IV Volumetric | **List of Major Equipment / Facilities** |
| | | Hot Plate , Gas Connection, Digital weighing machine(01) |
| | | **List of Experimental Setup in each Laboratory** |
| | | i) EDTA, EBT, Methyl Orange, $NaHCO_3$, Buffer, Ammonium Chloride, Ammonia , Phenolphthalein , $Na_2CO_3$, HCI, NaOH |

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## LIST OF MAJOR EQUIPMENT / FACILITIES & EXPERIMENTAL SETUP IN EACH LABORATORY / WORKSHOP

**Name of the Department: ENGLISH**

| S. No. | Name of the Laboratory / Workshop | Details |
|---|---|---|
| 1 | **CALL LAB**<br>**K.Block 3rd Floor**<br>**English Lab** | **List of Major Equipment / Facilities** |
| | | 1) 28 Computers in CALL LAB<br>(DELL Optiplex 3020<br>Intel ® Core ™ i5-4590cpu@3030GHz 3.30 GHz<br>8GB 64 -bit OS<br>2) A/Cs DAIKIN (02)<br>3) 30 Headsets (HP) etc.<br>4) Printer HP Laserjet p1007, UPS 10KV,<br>5) BATTERIES Power inn |
| | | **List of Experimental Setup in each Laboratory**<br>1) Software in CALL Lab :-SoftXPvt. Ltd. |
| 2 | **ICS LAB**<br>**K.Block 3rd Floor**<br>**English Lab** | **List of Major Equipment / Facilities** |
| | | 1) 01 Computer in ICS LAB<br>(DELL Optiplex 3020<br>Intel ® Core ™ i5-4590cpu@3030GHz 3.30 GHz<br>8GB 64 -bit OS<br>2) 01 Projector (NEC)<br>3) A/Cs DAIKIN (02) |
| | | **List of Experimental Setup in each Laboratory**<br>1) Software in CALL Lab :-SoftXPvt. Ltd. |
| 3 | **SOFT SKILLS LAB**<br>**M. Block Ground Floor** | **List of Major Equipment / Facilities** |
| | | **04 Labs**<br>1) **04 Computers** Intel ® Core ™ i5- 7500 CPU@3.40GHz 3.41 GHz 8GB 64 -bit OS<br>2) **04 Projectors**<br>Projector With Screen NEC<br>3) Woofer with 2 speakers (each lab) etc. |
| | | **List of Experimental Setup in each Laboratory**<br>1) Software in CALL Lab :-SoftXPvt. Ltd. |