

Mechatronics Technology

GCT BANNU

Mechatronics Technology (GCT BANNU)
List of Equipments for Mechatronics Technology

Electronics and Communication Lab

Sr.No.	Description of Equipment	Specification	Qty
1	Oscilloscope 30MHz	<p>Analog, ultra low speed and storage oscilloscope 3 in 1</p> <p>Features</p> <ul style="list-style-type: none"> .30MHz dual channel .20 MS/s sampling rate .Record length: 1k/CH+1kX2 (Reference Memories) .High sensitivity: 1mV/div .10 times sweep magnification (DSO mode: Max 100 times) .10s/div ultra low sweeping speed .Preset triggering function, pre-trigger signal observation .Two channels, two reference waveforms display simultaneous .Measure and display single shot, non-period signals .TV synchronization, X-Y mode .Z-Axis input; CH1 signal output .Built in RS232C interface .Analog, ultra low speed and storage oscilloscope, three in one .High performance with low price <p>ACCESSORIES</p> <p>Instruction manual x 1, Power cable x 1 ,Fuse x 1, Probe x 2</p>	02
2	Oscilloscope 100MHz	<p>100MHz DUAL CHANNEL OSCILLOSCOPE WITH CURSOR READ OUT AND DELAYED SWEEP</p> <p>Features</p> <ul style="list-style-type: none"> .100MHz bandwidth, dual channel, delayed sweep .10 sets memory for front panel setting save & recall .Cursor readout with 7 measurements .Panel setup lock of digital-control functions .Buzzer alarm .Trigger signal output .Z-Axis modulation input .SMD technology, high stability and reliability <p>ACCESSORIES</p> <p>Instruction manual x 1, Power cable x 1 ,Fuse x 1, Probe x 2</p>	02
3	Oscilloscope 200MHz	<p>DIGITAL STORAGE OSCILLOSCOPE COLOR</p> <p>Features</p> <ul style="list-style-type: none"> .Easy to read with color LCD display .Dual channel, bandwidth 200MHz .Sample Rate(Real-time) 1GSa/s, 	02

		<p>equivalent sampling 50GSa/s .4K channel memory depth .Advanced Triggering function from edge, video, pulse and delay .+, -, x, ÷ Mathematic Functions .FFT spectrum analysis: Hanging, Hamming, Blacking, etc. .10 Waveforms parameter Setups, Save, Recall .Capture rate is up to 1K/s .Digital filter and waveform recorder .Automatic self calibration .Front mask and cable container .Multiple-language user interface ,Rise time: 1.8ns</p> <p>Cursor Measure: Manual, trace, Auto measure I/O : USB Device Instruction manual x 1, Power cable x 1 ,Fuse x 1, Probe x 2</p>	
4	Function Gen Up to 10 MHz	<p>DDS Based 10MHz Function Generator with AM,FM,PM,FSK,PSK,ASK MODULATIONS</p> <p>Features .DDS technology and FPGA chip design, ultra-low power consumption .Sine wave in main output frequency: 1μ Hz~10MHz .Square, pulse and another wave in main output frequency .Sine wave, square wave, triangle wave in sub wave signal output frequency .Max. frequency resolution: 100mHz .Low distortion sine wave:<0.3% .Through the keyboard input frequency set value .Voltage display</p> <p>Output Waveform: sine, square, pulse, triangle, ramp, TTL and arbitrary</p> <p>Output Modulation: single frequency, sweep frequency, AM, FM, PM, FSK, ASK, PSK</p> <p>Wavelength: 6 – 4096 points</p> <p>Wave Accuracy: 10bits</p> <p>Sampling Rate : 150MSa/s</p>	02
5	Video pattern Generator	<p>Feature Video Pattern Generator is designed for repairing and adjusting any defects on TV set in PAL system. The RF range is covering from VHF CH3-CH4. and including color pattern, white raster and four basic patterns. The unit is used of IC circuit, air variable capacitor inner tuner and crystal controlled progressive scanning circuit. Such design of cute and portable type is really an efficient instrument for TV set servicing industry.</p> <p>Specifications:</p> <ul style="list-style-type: none"> • RF range: <ul style="list-style-type: none"> ○ PAL-B.D.G.H.I.K. system, IF 38 ~ 40MHz. ○ Preset IF = 38.9MHz, VLow = 55.25MHz, VHigh = 175.25MHz. • RF output level:10mVrms. • Impedance: 75Ω. • Sync. signal: X'TAL, vertical 50.036Hz, horizontal 15.611KHz. 	02

		<ul style="list-style-type: none"> • Sub-carrier freq: 4.43361875MHz ±50Hz. • Patterns: <ul style="list-style-type: none"> ○ Color, splitted into upper and lower portions. Upper half: Red, blush-green, blue, greenish-yellow, white. Lower half: four gray, black. ○ Dots 19 (V) x 15 (H) white. ○ Crosshatch 19 x 15 square, white. ○ Vertical lines 19 white. ○ Horizontal lines 15 white. ○ Restars fixed 100% brightness white. • Video output: Video output (BNC) 1Vp-p (open end). 	
6	Function Generator 2GHz PC Interface	2GHz DDS RF SIGNAL GENERATOR Feature .2GHz sine signal .Use - modulation single PLL fraction divider .Frequency range 9KHz~2002MHz .Produced by SMT, new type metal case .Save and recall function .Pulse modulation necessary .USB and RS 232 interface .High reliability MTBF>=10000h	01
7	Dual DC Power Supply 0 to 30V, +/-5V, 3A	Dual DC Power Supply Taiwan/Korea	03
8	Digital Multimeter PC Interface	Features: DC Volts : up to 1000V Min 5ranges AC Volts : up to 1000V Min 5ranges DC Current : up to 10A Min 5ranges AC Current : up to 10A Min 5ranges Resistance: up to 60MΩ Min 5ranges Capacitance : up to 6mF Min 5 ranges Frequency: up to 60MHz Min 5 ranges Temperature, Diode, Transistor, Continuity Buzzer Data Hold RS232C interface USB With all accessories and software	02
9	Digital Multimeter Hand Held	3 ½ digits LCD with a Max. reading of 1999 DC Voltage Range : 200mV, 2V, 20V, 200V, 1000V Resolution : 100μV, 1mV, 10mV, 100mV, 1mV AC Voltage Range : 200V, 750V Resolution : 100mV, 1V DC Current Range : 200μA, 2mA, 20mA, 200mA, 10mA Resolution : 0.1μA, 1μA, 10μA, 100μA, 1mA hFE Test hFE : Value : 0~1000	05

		<p>Resistance Range : 200Ω, 2kΩ, 20kΩ, 200KΩ, 2MΩ, 20MΩ, 200MΩ Resolution : 0.1Ω, 1Ω, 10Ω, 100Ω, 1kΩ, 10kΩ, 100kΩ</p> <p>Battery Test Range : 1.5V , 9V The working voltage of the batter will be displayed on the LCD, so that the quality of the battery can be judged.</p> <p>Diode and audible continuity test Diode : Display approximate forward voltage of diode Continuator : Bullt-in buzzer sounds if resistance is less than about 50Ω</p>	
10	<p>Electric Panels With USB, Circuit Breakers</p> <p>(With all accessories mention in the brochure and instructional manual)</p>	<p>Electrical installation safety system training With this basic equipment set the following topics can be covered: On-off circuit with and without earth contact socket Multiple light circuit with and without earth contact socket Multiple switch circuit with and without earth contact socket Intermediate light-switch circuit with and without earth contact socket Analysis of wiring diagrams This equipment incorporates all modules required for simple wiring installation circuits for a building. Modules Included: 2 On/off and multi-way switches 1 Multiple switch 1 Cross-over switch (for intermediate switch circuits) 2 Earth-contact sockets 4 Junction boxes 3 Incandescent lamps E14, 25W Nominal voltage: 230V Frequency: 50Hz</p>	01
11	<p>Microprocessor Trainer Peripheral Interfaces</p> <p>(With all accessories mention in the brochure and instructional manual)</p>	<p>8088 microprocessor Training System</p> <p>Features: compose of key system of 8088,open keyboard experiment board, 16 x 16 LED dot-matrix circuit, RS-232 interface circuit; small size direct current electrical machinery, step motor electronic sound circuit loudspeaker. 6 bit digital display,relay circuit,8 bit logical level display circuit.16 bit level display circuit. Temperature , 8MHZ frequency sources module, digital experiment device. Applications like :A/D and D/A</p>	02
12	<p>Digital electronics Trainer</p>	<p>Digital Logic Fundamentals The Digital Logic Fundamentals course provides comprehensive, hands-on instruction in the terminology, principles and applications</p>	01

	<p>With all Modules</p> <p>(With all accessories mention in the brochure and instructional manual)</p>	<p>of digital logic circuits.</p> <p>This module should be included with circuits: AND/NAND, OR/NOR, XOR/XNOR, Open Collector, SET/RESET Flip-Flop, D-Type Flip-Flop, JK Flip-Flop, Tri-State Output, TTL/CMOS Comparison, and Data Bus Controls</p> <p>Digital Circuit Fundamentals 1</p> <p>The Digital Circuit Fundamentals 1 course provides comprehensive, hands-on instruction in the terminology, principles and applications of digital circuits.</p> <p>This module should be included with circuits: Asynchronous Ripple Counter, Synchronous Counter, 4-Bit Shift Register, 4-Bit Adder, and 4-Bit Comparator</p> <p>Digital Circuit Fundamentals 2</p> <p>The Digital Circuit Fundamentals 2 course provides further comprehensive, hands-on instruction in the terminology, principles and applications of digital circuits.</p> <p>This module should be included with circuits: BCD Decimal Decoder/BCD Priority Encoder, ADC/DAC, Multiplexer/Demultiplexer, 7-Segment Driver/Display, and Parity Generator/Checker</p>	<p>01</p> <p>01</p>
13	<p>Image Processing Trainer</p> <p>(With all accessories mention in the brochure and instructional manual)</p>	<p>Image Processing Trainer</p> <p>The Trainers is the ideal development platform to evaluate Xilinx FPGA(s) in a wide range of Video and Imaging applications. The Video Starter Kit provides an embedded design framework that can be customized with user defined video accelerators implemented on the FPGA fabric. This unique combination of flexibility and processing power allows Xilinx FPGAs to address the most demanding security, industrial, medical, broadcast and automotive video applications.</p> <p>The Video Starter Kit eases FPGA adoption for new users by providing familiar hardware and software development environments. Video application software can be developed using an eclipse based software development environment provided as part of the Xilinx Embedded Development Kit. Hardware video accelerators can be developed and integrated into the embedded system without prior RTL using System Generator for DSP and Simulink from The Mathworks. Tight integration between these environments insures rapid development of real-time video applications.</p> <p>Key Features</p> <p>Xilinx Devices XC3SD3400A-4FGG676C Carrier Board Spartan-3A DSP 3400A Development Platform FMC-Video Daughter Card: (FMC-Video) DVI Input</p>	01

		<p>Single Channel In and Out Composite S-Video In and Out Two Independent Camera Interfaces CMOS Image Sensor Camera 742 x 480 x 60 Hz RGB progressive Scan Micron MT9V022 CMOS color image sensor</p>	
14	<p>Micro-controller Trainer</p> <p>(With all accessories mention in the brochure and instructional manual)</p>	<p>Micro-controller Trainer This course covers the basic knowledge and programming techniques needed for the 8-bit RISC microcontroller PIC16F887. The microcontroller's instruction set is comprised of 35 "single word" instructions and is thus perfectly suited for technical training purposes. All of microcontroller's ports can be accessed and used as desired. The power supply is available either via the working platform or by way of the USB interface. The clock frequency is generated either by an internal or external generator. RESET can be realised via software or hardware. The equipment set comprises the required hardware as well as interactive course ware. Scope of delivery: Microcontroller PIC16F887 Microcontroller adapter with socket, USB interface, connectible measurement points and ports 2mm pushbutton module 8 x 2mm LED module, red 8 x 2mm resistors 100 ohm 1 x 2mm resistor 10K USB-cable CD with course and DIE PC Interface with virtual instruments: The measurement interface software is the central unit of the desktop lab. It incorporates all inputs and outputs, switches, power and signal sources and measurement circuitry needed to perform experiments. Equipment: 32-bit processor with storage memory for measurements USB interfaces, transfer rate 12 Mbits/s Simultaneous connection of any number of Experimenters via serial bus system Analog output, +/- 10 V, 0,2 A, DC – 1 MHz, via BNC and 2-mm sockets 2 Analog differential amplifier inputs with 4 MHz bandwidth, safe for voltages up to 100 V, sampling rate 40 mega samples, 9 measuring ranges, memory depth 2 x 32 k, inputs via BNC or 2-mm socket 16-bit digital signal output, of which 8 bits are accessed via 2-mm sockets, TTL / CMOS, clock frequency 0 – 100 kHz, electric strength +/- 15 V 16-bit digital signal input, of which 8 bits are accessed via 2-mm sockets, memory depth 16 bit x 2 k, TTL / CMOS, sampling rate 0 – 100 kHz, electric strength +/- 15 V, 8 Relays 24V DC / 1 A, of which 4 are accessed via 2-mm sockets Power supply input 100-250 V, 50-60Hz</p>	01

		<p>Outputs 2 x +/- 15 V/0,4 A; 2 x 5 V/1 A</p> <p>Virtual instruments (meters and sources): 2 x Voltmeter VI, 2 x Ammeter VI: AC, DC, 9 ranges 100mV to 50V, true RMS, AV 1 x VI with 8 relays, 1 x Multimeter VI: Metrahit multimeter display (optional) in LabSoft 1 Dual-channel oscilloscope: band width 4MHz, 22 time ranges, 9 ranges 20 mV/div to 10 V/div, trigger and pre-trigger, XY and XT modes 1 x AdjustableDC voltage VI 0 - 10 V 1 x Function generator VI: 0.5 Hz - 1MHz, 0 - 10 V, sine, square, triangular, 1 x Arbitrary generator VI, 1 x Pulse generator VI 1 x VI with 16 digital outputs, 1 x VI with 16 x digital inputs, 1 x VI with 16 digital input/outputs. Display modes: binary, hex, decimal and octal numerals</p> <p>Experimenter for 2-mm plug-in component To be linked to measurement interface unit. 70 nodes allow for easily understood circuit set-ups in a compact space. Circuits are built by inserting the plug-in modules between nodes on the board. Connections between nodes can be made using 2-mm or 7.5-mm jumpers. Fixed and variable power supply connections via 2-mm sockets For use with 2-mm plug-in components 70 nodes each with 9 x 2-mm sockets 7.5-mm grid for 2-mm sockets 4 bus lines for power supply (+15 V,+5 V, -15 V, earth) via 2-mm sockets Ergonomic working thanks to console housings Contact loading: max. 10 A Measuring lead and plug set, 2mm-system, consisting of: 12 measuring leads, 2mm, 15cm, blue 12 measuring leads, 2mm, 15cm, yellow 2 measuring leads, 2mm, 45cm, black 4 measuring leads, 2mm, 45cm, red 2 measuring leads, 2mm, 45cm, blue 1 measuring lead, 4 to 2mm, 50cm, black 1 measuring lead, 4 to 2mm, 50cm, red 60 jumpers 2mm /7.5mm, black</p> <p>(With all accessories mention in the brochure and instructional manual)</p>	
15	<p>Meter Trainer All assorted meters mounted on one</p> <p>(With all accessories mention in the brochure</p>	<p>Universal Meter Panel trainer comprising of:</p> <p>VoltmeterDC Voltmeter AC AmmeterDC Ammeter AC Wattmeter Single Phase Wattmeter 3 Phase Power Factor Meter Frequency meter</p>	01

	and instructional manual)	Tachometer RPM meter Temperature / Humidity meter Light Meter Sound Level meter Magnetic Field meter	
16	Mini-process For Thermal Process Demonstrator Representation (With all accessories mention in the brochure and instructional manual)	<p>Features:</p> <p>Study of thermal Process Control Temperature Controller Use of Industrial Process Control Elements Signal Conditioning Control Quality and Optimum Control Process Loop Tuning & Stable Process Real-time PC interface with ADC & Digital input/output Process Control by ON/OFF Controller Process Control by PID with Auto Tuning Process Control Loops Mathematical Modeling and Calculations Stability of Process using Root Locus, Bode Plot , etc Process Indicators PC Interface for Open Loop & Close Loop Control PC Based Temperature Indicator Print and Save Feature for Real Time Data and Graph Real Time Graphical Representation User Friendly Software</p> <p>Technical Specifications Vessel Capacity : 2 Litres Temperature Measurement : RTD (-99 to 850°C) Heater : 48 V DC Temperature Range : from room temperature to 100°C Temperature Indicator : 0 to 350°C Control Valve : Manually Operated Stirrer : 0 or 24 V DC Level Sensor : 0 or 24 V DC Indicators : Level Indicators Stirrer Indicator Heater Indicator Relay Action : Forward for Cooling and Reverse for Heating PID Controller : Hardware based & Computer based ON/OFF Controller : Hardware based & Computer based Computer Interface Analog Input : One (0 to 10 V DC) Digital Input : Two (TTL) Digital Output : Two (TTL) Switches : Two (TTL) Signal Conditioning : Amplifiers with variable gain PC Based Temperature Indicator : 0 to 100°C</p>	01
17	Universal Testers/Prgmr (With all	<p>Features</p> <p>Device socket ZIF (Zero Insertion Force)</p>	01

	<p>accessories mention in the brochure and instructional manual)</p>	<p>socket accepts both 200-600 mil DIP devices Communications interface USB Version 1.1 DC/AC Characteristics Signal Voltage:2.5V- 5.0V Vcc Voltage:1.0V-10.0V 500mA Vpp,Vhh Voltage:1.0V-25.5V500mA High performance, low cost ,small , light , portable and professional design. Use USB interface to link with PC. Support low voltage components up to 2.5V. User-selectable verify Vcc with one or two pass Verify voltage. Support FLASH/EPROM device speedy programming function. It has the simple operation software, the programming procedure had been modify into few automatic process function. Automatic detect the device pin insertion and contact check, powerful graph showing the situation Automatic Procedure Automatic process: Select type, Load, Erase, Check, Program, Verify, Security. Copy: Copy device data directly. Automatic process Select type, Read, Confirm, Check, Program, Verify, Security. Data file format JEDEC, Binary, intel80/86 HEX Motorola Hex, Tektronic Hex Automatic file format detection EPROMs, EEPROMs, FLASH EPROMs, Serial E/EPROMs, NV RAMs, Microcontrollers, PLDs TTL/CMOS IC Tester Built-in Accessories: Main unit, USB Cable Operation software on CD-ROM Power adaptor: 90-260VAC auto-switching</p>	
18	<p>Sensors module (With all accessories mention in the brochure and instructional manual)</p>	<p>Module should be in included with: circuits using magnetic, optical sensors, vibration / shock sensors, pulsed infrared sensors, and motion sensors. Sensors in this module include an infrared photoelectric beam sensor, an infrared motion detector, a mechanical switch, a vibration detector, and magnetic proximity sensors</p> <ul style="list-style-type: none"> • Control Panels • Plunger Switches • Magnetic Proximity Sensors • Shock/Vibration Sensors • Electronic Active Sensors • Electronic Passive Sensors • Wiring Installation Techniques • Automobile Alarm Systems • Designing an Alarm System <p>And Related to that This module should be included with circuits: IC Transducer, Thermistor, RTD, Thermocouple, Strain Gauge, Capacitance Sensor, Ultrasonic Transducers (Transmission/Reception), and Infrared Controller (Transmission/Reception)</p>	01

<u>COMPREHENSIVE MECHATRONICS LAB:</u>		
S,No	Discription of the mechnery equipment	Quantity
1	Intr Management System	01
2	DAQ Board- National Instruments Lab PC or Eq	7
3	Machatronics Work Cell with Machine Vision and Sensors	1
4	Interface board for DAQ Trainer with DAQ interface	3
5	Manufacturing Sustum Flexible Manufacturing System	1
6	Transducer Trainer- With Maximum Sensors Interface	2

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<u>ROBOTICS</u>		
S,No	Discription of the mechnery equipment	Quantity
1	Motor control trainer- Servo concepts also capable to	01
2	Inverted Pendulum- Demonstrator	1
3	Low cost Robotic Arms- Lynx Motion	01
4	Magnetic Levitation- Demonstrator	1
5	Temperature control- Demonstrator	2
6	Robotic Arm- Ateast .75 Kg load with sensors	1
7	Process Control Trainer- with PC interface	2

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<u>PNEUMATICS</u>		
S,No	Description of the machinery equipment	Quantity
1	Board Pneumatic with Service unit combination of filters regulator Mainfold Distributor with 3/2 way valve 8 to 10 ports Double acting cylinder 2 No. stroke size 80 to 100 Single acting Cylinder 1 3/2 way valve push type normally closed 2 Flow control valve 4 3/2 way valve Air Operated 2 5/2 way valve air Operated 3 Shuttle valve (or valve) 3 Compressor 3/2 way valve roller type 4 3/2 way valve roller typed idle return stock 2 Pressure Regulator 1 set Plastic Tubing 100 meter	05

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<u>COMPUTERS</u>		
S,No	Discription of the mechninery equipment	Quantity
1	Computer latest core i3 or Higher	7
2	Printer Latest HP 2100 or Higher	02
3	Networking- Switch 24 Ports 2 GHz	02
	Network CAT-6 Cable	01
4	Multi Media - 2000 Lumens or Gigher with DLP	01

5	Computer latest P-IV or better	3
6	Different Tools and tool kits for three workshops	01