

## 10. RESOURCE REQUIREMENTS

### 10.1 Physical Resources

#### 10.1.1 Equipment Requirement:

Sr. No.	Description	Qty	Total Price (Rs)
<b>CARPENTRY SHOP</b>			
1	Work benches fitted with carpenter vices	5	20,000
2.	Circular saw grinder	1	6,000
3.	Wood cutting band saw-vertical	1	10,000
4.	Bench grinder	1	5,000
5.	Drilling machine	1	8,000
6.	Wood turning lathe	1	40,000
7.	Wood Planner	1	20,000
8.	Tool accessories measuring and marking Instruments	25	25,000
9.	Band saw blade brazing unit	1	10,000
<b>FITTING AND PLUMBING SHOP</b>			
1.	Work benches with vices (4 vices on each bench)	5	30,000
2.	Marking tables with scribes	4	24,000
3.	Surface plates	5	20,000
4.	Bench grinders	1	6,000
5.	Drilling machine	2	12,000
6.	Power Hacksaw	1	20,000
7.	Sheet Bending Machine	1	40,000
8.	Tool kits – taps, dies, drills	25	40,000
9.	Tool kits – chisels, hammers, files, hacksaw	25	25,000
10.	Accessories like calipers, V blocks, height, gauges steel rules and scribes	25	50,000
11.	Pipe vice	4	1,000
12.	Chain wrenches	5	1,250
13.	Ring spanner set	5	600
14.	Pipe die set 2”	2 set	1,000

15.	Pipe bending device	1	5,000
16.	Various plumbing fitting	LS	2,000
<b>FOUNDRY SHOP</b>			
1.	Moulding boxes	40	8,000
2.	Ladles	5	2,000
3.	Tool Kits	10 set	5,000
4.	Quenching tanks	2	5,000
5.	Portable grinder	1	3,000
6.	Pit furnace with blower	1	10,000
<b>PAINT SHOP</b>			
1.	Spray gun with hose pipe	1	1,000
2.	Paint brushes	20	2,000
3.	Paint/Varnish	LS	2,000
4.	Air Compressor with 2 hp motor	1 set	10,000
5.	Miscellaneous	LS	5,000
<b>SMITHY SHOP</b>			
1.	Blacksmithy forge (with open hearths, accessories to match the forge)	20	40,000
2.	Wrought iron anvils	20	20,000
3.	Swage blocks	4	8,000
4.	Blower with accessories, motor switch etc	1	6,000
5.	Work benches with vices	2	6,000
6.	Power hammer	1	20,000
7.	Tools and accessories – hammers, swages, tongs, pokers, pullers etc	20	10,000
<b>WELDING SHOP</b>			
1.	Electrical welding transformer set with accessories	3	30,000
2.	Gas Cutting Unit	1	3,000
3.	Work benches with vices	3	5,000
4.	Welding generator set	1	10,000
5.	Oxy acetylene welding set with accessories	1	7,000
6.	Acetylene generating set	1	6,000
7.	Electric welder tool kit	10	10,000
8.	Projection welding machine	1	15,000
9.	Brazing equipment with accessories	1	10,000
10.	Soldering irons	3	1,000

11.	Pedestal grinder	1	10,000
12.	Metal spraying gun	1	10,000
13.	Spot welder	1	25,000
14.	TIG welding set	1	1,00,000
15.	MIG welding set	1	1,00,000
16.	Welding Partition Screen	5	2,500
<b>APPLIED MECHANICS LABORATORY</b>			
1.	Polygon of forces apparatus	1	1,000
2.	Apparatus for reaction at supports	1	1,000
3.	Jib crane	1	1,000
4.	Screw jack	1	300
5.	Inclined plane and friction apparatus	1	500
6.	Worm and worm wheel	1	1,500
<b>MECHANICAL WORKSHOP</b>			
1.	Centre lathes	10	5,00,000
2.	Tool room lathe	1	1,00,000
3.	Lathe with copy turning attachment and other attachments	1	1,50,000
4.	Universal milling machine	1	1,25,000
5.	Vertical milling machine	1	75,000
6.	Shapers	2	1,00,000
7.	Radial drilling machine	1	25,000
8.	Upright drilling machine	1	20,000
9.	Gear Shaper	1	75,000
10.	Centreless grinder	1	80,000
11.	Universal cylindrical grinder	1	75,000
12.	Hydraulic surface grinder	1	50,000
13.	Tool and Cutter grinder	1	50,000
14.	Power hacksaw	1	25,000
15.	Pedestal grinder	1	5,000
16.	Electro discharge machine	1	4,00,000
17.	Work bench	3	6,000
18.	Precision instruments	1	5,000
19.	Surface plates	2	15,000

20.	Hand tools and accessories	2	6,000
21.	CNC trainer lathe	1	3,00,000
22.	CNC trainer milling machine	1	4,00,000
23.	PC Computer	2	1,00,000
24.	Computer based NC Programming Software	1	1,50,000
25.	CNC Simulation software	1	1,00,000
26.	CNC Milling machine accessories and holding devices	LS	1,00,000
<b>ELECTRONICS LABORATORY</b>			
1.	DC regulated low voltage variable power supply	10,	25,000
2.	DC regulated multiple output power supply	4	12,000
3.	Audio oscillator	4	16,000
4.	Wide band RC Oscillator	4	10,000
5.	RF Signal Generator	2	8,000
6.	Pulse Generator	2	10,000
7.	Function Generator	4	20,000
8.	Single trace CRO with accessories	4	60,000
9.	Dual trace CRO with accessories	4	1,00,000
10.	Electronic Multimeter DC and AC with different ranges	8	30,000
11.	Electronics digital Multimeter three and a half digit	8	25,000
12.	Digital LCR- Q meter	2	20,000
13.	Transistor tester type 911	1	5,000
14.	Audio output power meter	2	6,000
15.	Mains Voltage stabilizer(3 KVA)	1	10,000
16.	AC Millivoltmeters	4	16,000
17.	DC Millivoltmeters	2	6,000
18.	Voltmeter	5	3,000
19.	DC Ammeter	5	3,000
20.	Battery of different voltage and Ampere hour	2	3,000
21.	Single Phase variac	3	6,000
22.	Rheostat of different wattage and resistance	5	3,000
23.	Servo stabilizer power supply	1	8,000
24.	IC Bread Boards	20	10,000
25.	Distortion factor meter	1	10,000
26.	Decade resistance, capacitance and inductance (four each)	12	12,000
27.	Transducers: Pressure type, thermocouple, LVDT, opto Pick-up, electromagnetic pick-up, ultrasonic pick-up and potentiometer etc	LS	30,000
28.	Thyristor control experimental kits Instrumentation/Transducer experimental kit. Basic electronic experiment kit	LS	2,50,000
29.	Strip chart recorder	1	10,000

30.	Digital Panel meters	6	3,000
31.	Digital thermometer	1	4,000
32.	Stroboscope cum motor drive disc	1	10,000
33.	Digital load indicator with load Cells	1	10,000
34.	Digital Lux meter	1	8,000
35.	CROs 20 MHz (Scientific Make)	6 Nos.	22,000
36.	Function Generators Audio Frequency	6 Nos.	7,500
37.	Regulated Power Supply	6 Nos.	3,600
38.	Multimeter (Digital)	10 Nos.	20,000
39.	Rectifier Kits	6 Nos.	20,200
40.	Filter Circuit Kit	6 Nos.	2,200
41.	Bread Boards	12 Nos.	4,800
42.	Transistor Kits (a) CB (b) CE	6 Nos. 6 Nos.	2,400 2,400
43.	FETs	6 Nos.	5,400
44.	Operational Amplifier Kits	6 Nos.	33,000
45.	Raw Materials	LS	20,000
<b>MEASUREMENT LABORATORY</b>			
1.	Light Measurement (Photocells) Kit	8 Nos.	15,000
2.	LVDT Kit	8 Nos.	8,000
3.	Pressure Measurement Kit	8 Nos.	9,500
4.	Strain Measurement Kit	8 Nos.	14,000
5.	Water Level Measurement Kit	8 Nos.	11,500
6.	Velocity Measurement Kit	8 Nos.	7,500
7.	RPM Measurement Kit	8 Nos.	5,000
8.	Temperature Measurement Kit	8 Nos.	5,000
9.	Maxwell's Bridge Kit	8 Nos.	7,500
10.	Wein's Bridge Kit	8 Nos.	4,500
11.	Anderson Bridge Kit	8 Nos.	5,000
12.	Flux Meter (Digital) Kit	8 Nos.	5,000
13.	Q. Meter (Digital) Kit	8 Nos.	5,000
<b>ELECTRICAL ENGINEERING LABORATORY</b>			
1.	Ammeter, Voltmeter, Wattmeter and Energy Meters (3- phase and 1- phase)	8 each	40,000
2.	3-Phase Resistive load	4 Nos.	16,000
3.	LCR/Q Bridge	1	5,000
4.	Tong tester	4	12,000
5.	Transformer (single phase)	2	16,000
6.	Watt meter, Volt meter, Ammeter,	2 each	10,000
7.	DC Shunt Motor, 2 hp with loading arrangement	1	20,000

8.	Induction Motor (Single phase)	2	10,000
9.	Induction Motor (Three phase)	2	10,000
10.	Slipring Induction Motor 3 HP with loading facility	1	25,000
11.	Alternator and Load for Alternators	1	25,000
12.	DC generator with prime-mover motor	2	25,000
13.	DC Regulated Power Supply	2	6,000
14.	Starters (DOL and Star Delta)	2 each	8,000
15.	Rheostats	4	12,000
16.	Tacho meters (digital)	2	15,000
17.	Maggar (Insulation Tester)	2	5,000
18.	Earth Tester	2	10,000
19.	Digital Multi-meter	10	32,000
20.	Rectifier, Inverter Set	1	10,000
<b>COMPUTERS LABORATORY</b>			
1.	Computer – Pentium	11	4,00,000
2.	Plotter	1	75,000
3.	Scanner	1	3,500
	Printer (Laser, DMP)	3	80,000

<b>Sr. No.</b>	<b>Description</b>	<b>Qty</b>	<b>Total Price (Rs)</b>
<b>IQC LABORATORY</b>			
1.	Digital vernier calliper	3	5,000
2.	Digital micrometer	3	5,000
3.	Height gauge	2	1,500
4.	Depth gauge	2	1,000
5.	Combination set	1	1,000
6.	Bevel protractor	1	1,000
7.	Sine bar	1	1,000
8.	Precision balls and rollers	1	500
9.	Surface plate	2	15,000
10.	Slip gauges set	1	10,000
11.	Comparator – Mechanical , Pneumatic	2	40,000
12.	Gear tooth vernier	1	2,000
13.	Snap and ring gauges	1	1,500
14.	Feeler gauge, radius gauge	1	1,000
15.	Angle plate	1	1,000
16.	Tool makers microscope	1	40,000
17.	Profile projector	1	75,000
18.	Surface roughness tester	1	60,000

NOTE:

In addition to above, laboratories in respect of physics, chemistry will be required for effective implementation of the course.

Provision for overhead projector, TV with VCR facility slide cum strip projector, TV with VCR facility slide cum strip projector, 16 mm film projector, photocopier, PC-XT facilities, duplicating machines, drafting machines etc has also to be made.

#### **10.1.2 Space Requirement:**

Norms and standards laid down by All India Council for Technical Education (AICTE) may be followed to work out space requirement in respect of class rooms, tutorial rooms, drawing halls, laboratories, space required for faculty, student amenities and residential area for staff and students.

#### **10.1.3 Furniture Requirement**

Norms and standards laid down by AICTE be followed for working out furniture requirement for this course.

#### **10.2 Human Resources:**

Weekly work schedule, annual work schedule, student teacher ratio for various group and class size, staffing pattern, work load norms, qualifications, experience and job description of teaching staff workshop staff and other administrative and supporting staff be worked out as per norms and standards laid down by the AICTE.