

11. RESOURCE REQUIREMENT FOR CIVIL ENGINEERING DEPARTMENT

11.1 Physical Resources

11.1.1 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.

11.1.2 Equipment Requirement: (Cost is very much tentative. Latest cost may be checked from the market)

1. Name of Laboratory: Construction Materials Testing
 - A) Concrete
 - B) Roads and Soils

CONCRETE TECHNOLOGY LAB AND CONSTRUCTION MATERIAL LAB			
S.No.	Name of the equipment	Specifications	Quantity
1	Length Gauge	Conforming to IS:2386 (Part-I) (consisting of a metal plate on which 8 steel pins are vertically mounted at specific distances, assembly mounted on a hardwood base)	2 Nos
2	Thickness Gauge	Conforming to IS:2386 (Part-I) (consisting of a panel constructed from heavy gauge sheet steel, having accurately cut slots of different standard lengths and widths)	2 Nos
3	Density basket	Conforming to IS:2386 (Part-III) constructed from G.I. wiremesh of size 20 cm dia and 20 cm high, complete with handle	2 Nos
4	Cylindrical metal measures	Conforming to IS:2386 (Part-III) Made out of sheet steel with handles, complete with one tamping rod 16 mm dia and 60 cm long rounded at one end.	
		15 ltr. Capacity	2 Nos
		10 ltr. Capacity	2 Nos
		3 ltr. Capacity	2 Nos
5	Standard test sieves (G.I. sheet framed)	Conforming to IS:460 (Part-II), perforated plate test sieves, 300 mm dia (with lid and pan) having following aperture sizes: 63mm, 40mm, 31.5mm, 25mm, 20mm, 16mm, 12.5mm, 10mm, 6.3mm, 4.75mm	2 Set

6	Standard test sieves (Spun brass framed)	Conforming to IS:460, 200 mm dia, woven wire cloth (with lid and pan) having following aperature sizes: 4.75mm, 2.36mm. 1.18mm, 600 micron, 300 micron, 150 micron, 75 micron	2 Set
7	Slump test apparatus	Conforming to IS:7320 consisting of (i) a slump cone (made of sheet steel suitably protected against corrosion) 100 mm dia at the top, 200 mm dia at the bottom and 300 mm high with two cleats and lifting handle (ii) A base plate with clamping arrangement for the slump cone and a swivel handle (iii) a tamping rod 16mm dia and 60 cm long with one end rounded and graduated from 0 to 15 cm in 0.5 cm spacings to measure the slump	4 Nos
8	Compaction factor apparatus	Conforming to IS:7320 consisting of (i) two conical hoppers with trap doors [(Upper hopper-top internal dia = 25.4 cm, bottom internal dia = 12.7 cm and internal ht.=27.9 cm),(Lower hopper- top internal dia = 22.9 cm, bottom internal dia = 12.7 cm and internal ht.=22.9cm)] (ii) one cylindrical receiver - Internal dia=15.2 cm, internal ht.= 30.5 cm (iii) A weleded steel stand for mounting the hoppers and the receiver co-axially at specified distances (iv) two trowels (v) one hand scoop (vi) one standard tamping rod 16mm dia and 60 cm long with one end rounded	1 No
9	Digital Concrete Test Hammer (Rebound Hammer)	Conforming to IS:13311(Part II):1992, Impact energy 2.207 Nm, Measuring range 10-70 N/sqmm, Reproducibility +/- 0.5 R, Display on 128 x 128 graphic LCD, RS 232 C port, Intergrated software for printing the measured values and transmitting to PC, cable, carrying strap, grinding stone, accuracy of measurement +/- 0.2R, display unit with non volatile memory for 5000 measured values, temperature range -10 to + 60°C, Battery operation with six LR6 batteries, 1.5 volt for 60 hours, carrying case, printer cable, transfer cable for PC, testing anvil	2 Nos

10	Automatic compression testing machine	Conforming to IS:14858:2000, 2000 kN capacity, Automatic control, 3 phase pump motor, oil level sensing, pace rate control at preset value, least count 1 kN, temperature monitoring, automatic tripping of power supply to 3 phase pump, Branded P-IV computer with latest specifications (Intel® Core™2 Duo processor Genuine Windows® 7 Home Basic 3GB DDR3 SDRAM 320GB SATA HDD 512MB ATI® Radeon™ HD 4350 graphics card 18.5" Flat Panel Monitor 16x DVD+/-RW Drive , Laserjet printer (with USB port, 2 MB RAM, Paper handling support A4, 600 x 600 dpi max resolution), 625 VA UPS with 30 minute backup	1 Set
11	Sieve shaker (Motorized)	Having a sturdy cast iron body, inclined sieve table which can accommodate a maximum of eight sieves of 300 mm dia, adjustable top clamping plate to hold the sieves, table having a gyratory motion in addition to up and down jolting action, operating gear assembly enclosed in an oil bath fitted with a transparent oil level indicating window, suitable for operating on 220 V, 50 Hz, single phase supply, time switch adjustable from 0-60 minutes, adaptor for 200 mm dia sieves	1 Set
12	Ultrasonic Concrete tester	Conforming to IS:13311(Part I):1992, Display unit with non volatile memory for 5000 measured values, temperature range -10 to + 60°C, Display on 128 x 128 graphic LCD, RS 232 C port, Intergrated software for printing the measured values and transmitting to PC, Resolution : 0.1µs, voltage pulse 600 V, pulse rate 3/s, impedance at input:1 kΩ, Battery operation with six LR6 batteries, 1.5 volt for 30 hours, 54 kHz transducers, cable, calibration rod, coupling paste, carrying strap, Operating instructions, carrying case	1 Set
13	Cube moulds	Conforming to IS:10086, Made up of cast iron, size 150mm x 150mm x 150mm, faces machined flat with +/- 0.02mm tolerance and the inside dimensions accurate within +/- 0.02mm, with BSI certification	6 Nos
14	Vibrating table	Conforming to IS:2514, capable of accomodating four cubes of 150mm size, suitable for operation on 440 V, 50 Hz, 3 phase supply, table top size 50cm x 50cm having stops all along its edges.	1 Set

15	Platform Weighing Machine (Digital)	For weighing upto 100 kg, accuracy 50g	1 Set
16	Digital balance	For weighing upto 20 kg, accuracy 1g	2 Nos
17	hardness kit	Mohars kit of hardness with 9 specimens Size averages 1-2" for all specimens. Packed in a nice divided box with identification key.	2 Nos
18	Glassware	Measuring cylinders 1 ltr, 2ltrs	4 Nos each
19	Vicat apparatus	Automatic test cycle, Double recording: analogic on paper and digital by electronic sensor, Storing of test results, settings and data, Large graphic display to follow the test in real time, RS 232 output for connection to PC and printer, High flexibility in programming the test cycles as test start delay, dropping rate auto-mode, free or driven drop RS 485 network facility for connection to PC of up to 16 independent VICAMATIC for data acquisition and processing, Fully conforming to EN, ASTM, AASHTO, BS and similar, High versatility and vast applications: from the standard use in local laboratories to the multiple use in research and central laboratories, Also suitable for tests on Gypsum conforming to EN 13279-2, Technical specifications 128x64 pixel display unit, Voltage: 230 V, 50-60 Hz, 1 ph. or 110 V, 60 Hz, 1 ph., Dimensions (l x w x h): 180x300x440 mm, Weight approx.: 10 kg, with complete accessories like needle etc.	1 Set
20	Vicat apparatus	The apparatus consists of a metallic frame bearing a freely moveable rod with a cap at top, one vicat mould, split type and glass base plate and one set of needle one each initial and final setting time, consistency plunger fitted with dash pot. Accessories: Mild steel base plate 5 inches x 5 inches. Fulcrum mould, brass, 70mm 1.0 base dia x 60mm I.D. top dia, 40mm height.	4 Nos
21	Le chatelier apparatus	Le chatelier mould as per IS 5514 complete with glass plate and lead weights and le chatelier flask as per IS 4031	5 Nos

List of tools & equipments Survey lab-I		
No	Name of equipment	Qty.
1	Metric chain 20mt	2
2	Metric chain 30mt	2
3	Measuring tape(Metalic) 30mt.	4
4	Measuring tape(Fiber glass) 30mt.	4
5	Measuring tape(steel) 30mt.	2
6	Measuring tape(Invar) 30mt.	2
7	Ranging Rods(steel)3 Mt painted with red and white paint	20
8	Cross Staff (Aluminum) with wooden box and pole stand 4"	10
9	Arrows made up of 6mm dia steel bar 40 cm length painted with black paint	100
10	Indian optical square round shaped	5
11	Indian optical square wedge shaped	5
12	Prematic compass made of gunmetal with stand size 125mm	5
13	Prematic compass made of gunmetal with stand size 150mm	5
14	Surveyor's compass 100 mm size made of gunmetal with stand	2
15	Dumpy level Quick setting 300 mm 12" internal focussing with all standard ass. Packed in wooden box with wooden stand made of aluminium and brass	5
16	I.O.P. Level 228 mm internal focussing with all standard ass. Packed in wooden box with telescopic aluminium stand made of aluminium and brass	2
17	Dumpy Level 228 mm internal focussing with all standard ass. Packed in wooden box with telescopic aluminium stand made of aluminium and brass	2
18	Aluminium telescopic staff 4mt long 3 section 5mm graduation with cover	5
19	Plane table size 750mmX600mm x150mm as per ISI specifications with all standard accessories (Spirit level, alidate , plumbing fork with plum-bob, trough compass)	5
20	Altimeter with barometric pressure 3 cile range 0to5000 meter with least count 20 mt.	2
21	Altimeter with barometric pressure 3 cile range 0to6000 meter with least count 50 mt.	2

SURVEYING-II LAB			
S.No.	Name of the equipment	Specifications	Nos. required
1	Auto level	Telescope (configuration: Objective aperture-32 mm, magnification-24x, Image-erect, resolving power 4", Min. focussing distance-0.3m, Reticle-Cross hairs, stadia multiplication constant-100, stadia additive constant-0), Gun sight, 2mm standard deviation for 1 km double run levelling, Compensator (with magnetic damping system, working range - +/- 15', setting accuracy 0.5", horizontal circle graduations 1°, sensitivity of circular level-2mm, Plane mirror for circular vlevel, horizontal fine motion screw with double sided endless drive, base-concave and flat, telescopic aluminium tripod, lens cap, plumb bob, vinyl cover, tool kit, operator's manual, carrying case with shoulder strap.	4
2	Transit Vernier theodolite	Accuracy-20 sec, erect image with special coated high range lenses, Achromatic Eye Piece, all component made of metal, Optical Plummet System, complete with tools in Wooden Box & with Aluminum Powder coated colored folding telescopic tripod stand in carrying case, complete with all standard accessories.	4
3	Total station	Having angular least count of 1" or better & accuracy of 2" (or better) both for horizontal & vertical angles, image-erect, field of view-1°30' or better, minimum focussing distance-2.0m or less, compensator (dual axis type, compensating range +/- 4' or better), memory for 10,000 data blocks and should measure at least 3 km with single prism, 500 m in reflector less mode, laser plummet, sensitivity of plate level 30"/2mm, sensitivity of circular level 10'/2mm, Display-Graphic CD illumination (bright readable in sunlight), keyboard-alphanumeric, two fixed control panels or one detachable GPS compatible controller (controller unit) proprietary required softwares, operating temperature: -10°C to + 50°C, user manual, container, 30 x telescope magnification, blue tooth wireless technology, removable USB stick, USB port, RS 232 port, emitting guide light for stake out, tribrach with laser plummet, telescopic aluminium tripod, Rechargeable batteries -2 nos., Charger with adapter-1 no., Data transferable cable-1no., Prism with holder and target plate - 2 nos., Reflector pole (of aluminium, telescopic with circular bubble, m & feet graduation, extendable to more than	1

		2m, with light weight aluminium tripod)- 2 nos., PC utility software Data Transfer and Conversion software.	
4	Electronic Digital theodolite	Telescope (configuration: Objective aperture-45 mm, magnification-30x, Image-erect, resolving power 3", Min. focussing distance-0.9m from telescope, stadia multiplication constant-100, stadia additive constant-0, Least count 1", Accuracy 2", automatic dual axis compensator, key board and display (LCD, 8 digitsx2 lines with backlight) on both sides, Interface (asynchronous serial, RS 232C compatible), self diagnostic function, right angle buzzer, Sensitivity of plate level 20", Sensitivity of circular level 2mm, optical plummet (Image-erect, magnification 3x, min. focus 0.3m), detachable tribrach, operating temperature -20 to =50°C, automatic power cut off, batteries 2 Nos. (LR14/C), standard accessories (lens cap, lens hood plumb bob, vinyl cover, tool kit, operator's manual, carrying case with shoulder strap.	2
5	Aluminium telescopic staff	5 mtr. Long, 3 section, 5mm graduation, with cover.	4
6	Ceylon Ghat Tracer	Made in full brass, with rack and pinion adjustment divided from 1 in 6 to 1 in 120 angle of elevation and depression complete in wooden box with wooden target and stand.	4
7	Tangent Clinometer	Made in full brass, with rack and pinion adjustment, bubble and levelling screw, leather case.	4
8	Pantagraph	Made of full brass with metal fittings with casters, clamps, socket complete in polished wooden box, size 24".	4
9	Abney level	With reflector arc divided to single degree, slow motion arrangement, size 125 mm, leather case.	4
10	Planimeter	Sliding bar pattern as per IS 7543 in velvet lined box with calibration chart, range >100cm.	4
11	Digital planimeter	Roller type with computing function, Hold memory function, Auto power off, unit & scale values conversion function, Display [Liquid crystal display 8 digits, 10 Symbols, (Symbol :Batt-E, SCALE, MEMO, HOLD, cm ² , m ² , km ² , ft ² , acre], Transverse direction roller movement unlimited, Precision- within +/- 0.2%, Internal rechargeable Ni -Cd battery chargeable with AC adapter, Operating Time- around 30 Hours using Battery, plastic case, operating manual.	1
12	Global positioning system	GPS with accuracy post processed 2-5 mtrs.	1

List of computer application in Civil Engg.		
Sr. No.	Name of Equipment	Qty.
1.	Computer P-IV or latest	20
2.	Auto CAD 2010 For 20 User	1
3.	STAAD PRO for 20 user	1
4.	Computer table with chairs	20
5.	UPS for power back up (5KVA)	1
6.	Printer	2
7.	Plotter	2

List of Transportation Engg. Lab		
S.No	Name of equipment	Qty
1	Ductility test apparatus: The apparatus consists of a water bath with a thermostatic heater, and a circulating pump to maintain uniform water temperature. One half of the briquette moulds is fixed on a fixed plate in the water bath, the other half of the briquette mould is fixed to a carrier which slides over a rotating threaded shaft with a clutch. The motor and gears to rotate the shaft are housed in a cabinet fixed above the other end of the bath. A pointer fixed to the carrier moves over a scale graduated from 0-110 cm x 1mm fixed on the bath with "0" (zero) of the scale towards the fixed plate side. The rotating shaft has 2 speeds of travel for the bracket, 5cm/min and 1 cm/min., selected by a clutch. Water bath inside is aluminium, it is an insulated water bath. Water bath is provided with a drain. A heater with thermostatic control is fixed inside the water bath. Control switches for motor, stirrer, heater and indicator lamps are fixed at a convenient place on the water bath, complete with three briquette moulds and one base plate, all made of brass. Operates on 230 volts A.C. single phase. Accessories : 1. Thermometer IP 38 C, range 23°C to 27°C. 2. Ductility mould with base-plate.	1
2	Impact test apparatus: comprise a circular base with two vertical guides. The hammer of weight $13.75 \pm 0.25\text{kg}$ can be lifted to fall freely down the vertical guides. The height of fall can be set through $380 \pm 5\text{mm}$. The hammer is offered with a locking arrangement. The hammer falls freely to the base and can be removed. The aggregate impact value test apparatus is supplied with metal measure 75mm diameter x 50mm high and tamping rod 230mm long x 10mm diameter with blow counter.	1
3	Standard Penetrometer: penetrometer consisting of a vertical pillar mounted on a base designed with the leveling screws, The head, together with dial plunger rod and cone slides on a pillar that can be clamped at any desired	

	height,A rack and pinion and pointer assembly,The dial with graduation in 400. 1/10 and the millimeter subdivisions .	
4	<p>Los angeles abrasion value test apparatus:- Los Angles abrasion testing machines for operation on 440 volts, 3 phase, 50 cycles and A.C. Supply. The machine consists of a hallow cylinder mounted horizontally on a strong frame on ball bearings. Along with the machine, a tray is supplied for collection of the material at the end of the test.</p> <p>a dust tight cover to facilitate charging and discharging the drum with the material under test</p> <ul style="list-style-type: none"> •A detachable shelf which extends throughout the inside length of the drum which catches the abrasive charge and does not permit it to fall on the cover. •The drum is rotated by an electric motor through a heavy reduction gear at a speed of 30-33 r.p.m. •A revolution counter fitted to the frame. •Complete with abrasive charges consisting of a set of twelve hardened steel balls, approximately 48mm dia. 	1
5	The apparatus consists of steel bracket with a sliding plate support. The support has two holes of 10mm dia on which a Ring and Ball guide can be kept. A central hole on this plate is for inserting thermometer. Supplied with a glass beaker approximate 8.5cm. I.D., 12cm high and a hand stirrer and 2 nos. 9.5mm dia steel balls.Thermometer IP 60C range 2°C to 80°C, Thermometer IP 61C range 30°C to 300°C x 5°C	4

Soil & Foundation Engg Lab		
S. No.	Name of Item	Qty.
1	Liquid Limit Device with Counter (manually operated)Casagrande Grooving Tool and Gauge Block (Type A of IS : 9259)ASTM Grooving Tool (Type B of IS : 9259)	3
2	Liquid Limit Device: Motorised supplied with counter and Casagrande & ASTM Grooving tools and gauge block. Suitable for operation on 50 Hz, single phase AC supply.	1
3	Set of 20 Cm dia. Brass Sieves 20 mm,12.5 mm,10.00 mm,6.3 mm,4.75mm,4.00mm,2.80mm,2.36mm,2.00mm,1.70mm,1.18mm,1.0mm,850,600,425,300,212,150,125,63microns,pan & cover.	1
4	Motorised Sieve Shaker A digital timer adjustable from 0-99 minutes incorporated as an integral part of the equipment.The Sieve Shaker should be capable of carrying upto 8 sieves. Driven by a ¼ HP geared motor Operating on 220 V, single phase AC.Extras :A	1

5	<p>Compaction Test Apparatus (Manual) Ref. Standards IS:2720 (Part 7), IS:2720 (Part 8) IS:9198, IS:10074, BS:1377 ASTM D 698, D 1557 Mettalic Mould Internal Dia. 100 mm,Volume : 1000ml,Height 127.3 mm Dynamic Ramming Tool 2.6 kg x 310 mm fall,Compaction mould</p>	2
6	<p>Permeability Test Apparatus : Ref. Standards IS:2720 (Part 17), IS:11209 The apparatus consists of :Stand with three glass tubes of 6 mm, 10 mm and 20 mm dia approx. Metallic Mould 100 mm dia x 127.3 mm height, 1000 ml volume.Extension Collar 100 mm dia</p>	1
7	<p>Standard Penetration Test Set Ref. Standards IS:2131, IS:9640 The equipment consisting of the following : Split Spoon Sampler 50.8 mm OD and 38 mm ID. This sampler consists of : Body split lengthwise. Shoe hardened with an inside cutting edge. Head fitted</p>	1
8	<p>Sampling Auger Outfit, Blade Type, 100 mm dia. Sampling Auger Outfit, Blade Type, 150 mm dia. Extension Rods for use with the above mentioned Auger Heads, one metre in length, threaded at both ends with hexagonal couplings. Handle and T-piece Spanner, for</p>	1
9	<p>Sampling tube 38mm dia x 200mm long, unrelieved. Mild Steel 50mm dia x 200mm long, unrelieved. Mild Steel 100mm dia x 200mm long, unrelieved. Mild Steel</p>	4 each
10	<p>Sand Replacement Method Sand Pouring Cylinder Apparatus, As per IS:2720 (Part 28) Sand Pouring Cylinder fitted with Conical Funnel and Shutter, capacity 3 litre Cylindrical Calibration Container 100 mm ID x 150 mm height Metal Tray size 30 x 30 x 4 cm, wi</p>	2
11	<p>Hydraulic Sample Extruder Electrical-cum - Hand Operated 60 cm piston stroke. 50kN pushing force. Adapter rings and ejector discs for 38, 50, 75, 100 & 150 mm dia sampling tubes or moulds, included. Built-in safety valve to prevent loading beyond 50kN. Po</p>	1

12	Core Cutter It consists one each of : Cylindrical core cutter made of steel, 127.3 mm long and 100mm internal diameter. Steel Dolley, 25 mm high with a lip to enable it to be located on top of the core cutter. Rammer with detachable steel rod. Spare, Opti	1
13	LABORATORY HOT AIR OVEN Size 300x300x300 mm volume 28 liters Temperature range 5°C above ambient to 250°C (Standard) Nominal power 600 to 1250W Nominal voltage V 220-230 Volts, Single Phase, Frequency Hz 50, Double walled thermostatically controlled: I	1
14	Electronic balance Capacity x Readability (kg) 10 kg x 0.001 kg, Auto (Menu Select)ON or OFF ,Tare range Tare full capacity,Operation temperature 50°F -86°F / 10°C-30°C , Stabilization ~ 2 seconds,Display 7 segment LCD 5/8" in Height ,Calibration Exte	1
15	Electronic balance Capacity x Readability (kg) 0.5 kg x 0.001 kg Auto Off (menu select) ON or OFF ,Tare range Tare full capacity,Operation temperature 50°F -86°F / 10°C-30°C ,Stabilization ~ 2 seconds,Display 7 segment LCD 5/8" in Height, Calibration	1

WATER SUPPLY & SANITARY ENGG. LAB

S. No.	Name of Item	Qty.
1	Digital Turbidity Meter Range: 0-1000 NTU, Display 3½ Digital LED, Detyector: Photocell/photo diode, Resolution: 1 NTU accuracy ±3%FS ±1 digit compete with test tube set,light source 6v tungsten lamp, Power 230V±10%,	1 No.
2	Chlorine Kit Compete for measuring Residual Chlorine content	4 Nos.
3	DO Meter Display: 3½ digital LED, Range: 0 to 20 ppm,Resolution D.O. 0.1 ppm , Calibration: Manual, Accuracy:±0.1 ppm, Temp. Range: 0 to 60°C with ± 0.2°C accuracy,Compensation D.O. 3%, D.O. Sensor	1 No.
4	pH meter(Microprocessor Based) Range : 0-14 pH ,0to ±199mv Resolution: 0.01 pH,1mV Accuracy 0.01 pH±1 digit,±0.1mV Display: 16X2 Line Alphanumeric LCD Temperature compensation 0-100degree centigrate	1 No.
5	Jar Test Apparatus Speed: Variable 20 rpm to 100 rpm with electronic speed regulator. Six Stirrer having paddle approx. 1" x 3" , stirring rod having 10" long approx and suufficient space to hold Borosil Beakers,	1 No.
6	Conductivity Meter /T.D.S Meter Display: 3½ digit LED, Range 5 Ranges,0 - 1000 Mohs/cm 2 Ranges , 2 & 20 Mohs/cm ,Temperature Compensation Manual 0-50oC, Conductivity Cell Platinum DIP ,Cell Constant 0.2 to 1.8	1 No.

7	Water Analysis Kit Display: 3½ Digit LED , TEMP. COMP. 0°-100°C. Manual, pH Range 0 to 14pH ,Resolution 0.01pH ,accuracy ±0.01 pH±1 digit, Conductivity range 0-20ms, 0-200m,Resolution 0.1 Micro Mhos, O.R.P. /mV R	2 Nos.
8	NEPHELO TURBIDITYMETER Range: 0 - 10,000 NTU Principle of Operation: Nephelometric Ratio (Color Correction): Full Time ON or OFF Accuracy: ± 2% of reading plus 0.01 NTU (0 to 1000 NTU) ± 5% of reading (1000 to 4000 NTU) ± 10% of reading	1 No.
9	B.O.D. Incubator Capacity 12 CFT, Volume 340 lts,dimension inner 60X60X95 cms, Temp.range 0°-60°C , temp accuracy±5°C. Power Supply 230V±10%,	1NO
10	Chlorine meter Digital display, residual chlorine, temp., and time simultaneous, Range Residual Chlorine :20 to 300 mg/L(ppm) Temperature: 0 to 45 degrees C., Repeatability Residual Chlorine: +/-10% (+/- 30 mg/L), Response time Within 90 seconds, Wat	1No

NOTE:I

In addition to above laboratories in respect of physics, chemistry, applied mechanics, structural mechanics, workshops, computer centre etc. will be required for effective implementation of the course.

Provision for overhead 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.

11.1.3 Furniture Requirement

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

11.2 Human Resources Requirement:

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