DRAFT

Syllabus for the Trade

Of

DRAUGHTSMAN MECHANICAL, DRAUGHTSMAN CIVIL & READING OF DRAWING AND ARITHMETIC

Under

Modular Pattern

Of

CRAFT INSTRUCTOR TRAINING SCHEME

ENGEENIRING TECHNOLOGY

(ET)

Duration:-3 Months/13Weeks

Designed in – 2009

Government of India

Ministry of Labour & Employment

Directorate General of Employment and Training

ADVANCED TRAINING INSTITUTE

KOLKATA

DASNAGAR, HOWRAH
WEST BENGAL – 711105

List of members attended the Trade Committee Meeting to finalise the Draft Syllabus for the trade of **Draughtsman Mechanical, Draughtsman Civil & Reading of Drawing and Arithmetic** under Modular Pattern of Craft Instructor Training Scheme of Engineering Technology (E.T.) , held on **21.5.2009**, at Advanced Training Institute Kolkata.

Sl. No.	Name & Designation S/Shri/Smt.	Organisation
1.	N.K.Chatterjee, Director	A.T.I.Kolkata
2.	J.Ukil, J.D.T.	A.T.I.Kolkata
3.	N.C.Mandal, Principle, ITI Howrah Homes	Representative of Govt. Of W.B.
4.	S.P.Ghosh, Asst.Engineer (Trg.)	Bridge & Roof Co. Ltd.
5.	Dr. N.K.Singh, Asst. Professor(Workshop)	I.S.M. University, Dhanbad
6.	M.Halder, Asst. Engineer(C)	C.P.W.D. Kolkata.
7.	K.L.Kuli, D.D.T.	CSTARI, Kolkata.
8.	A.K.Koley, Consulting Engineer	
9.	S.P.Bhatterjee, D.D.T.	A.T.I.Kolkata
10.	I.S.Katarha, D.D.T.	A.T.I.Kolkata
11.	S.Pal, D.D.T.	A.T.I. Chennai
12.	S.K.De, A.D.T.	A.T.I.Kolkata
13.	A.K.Mandal, A.D.T.	A.T.I.Kolkata
14	A.K.Dutta, A.D.T.	A.T.I.Kolkata
15.	Sk. A. Hossain, T.O.	A.T.I.Kolkata
16.	S.Ghosh, Sr. D/Man	A.T.I.Kolkata
17.	K.B.Lakshmi, V.I.	A.T.I.Kolkata

GENERAL INFORMATION

1. Name of the trade : Draughtsman Mechanical, Draughtsman Civil & Reading Of Drawing And Arithmetic

2. Name of the Module : Engineering Technology

3. Duration : 03 Months

4. Entry Qualification : Candidate who have passed Diploma in relevant branch of Engineering or National Apprenticeship Certificate in the concerned trade or National Trade Certificate with one year Practical Experience in concerned trade.

COURSE STRUCTURE

Module: - ENGINEERING TECHNOLOGY (ET)

Sl. No.	Components	Units	Allotted time/week	Allotted Time/Modu
1.	Engineering Technology	a) Workshop Science	20 hr./wk.	20x13=260
		b) Workshop	19 hr./wk.	19x13=247
2.	Library	Calculation	01hr./wk.	1x13=13 h
		c) Library		
			40hr./wk.	520 hr. / Mo

DURATION: 3 Month/13 weeks.

OBJECTIVE

THE OBJECTIVE OF THE COURSE IS TO TRAIN INSTRUCTORS USING I.C.T. & C.B.T. IN THE TECHNIQUES FOR IMPARTING TRAINING ON LATEST KNOWLEDGE IN THE RELATED TRADE KEEPING IN VIEW OF THE PRESENT AND FUTURE GLOBAL INDUSTRIAL REQUIREMENTS, SO THAT SEMI-SKILLED /SKILLED MAN POWER OF THE COUNTRY MAY BECOME ENABLE TO COMPETE IN THE GLOBAL MARKET.

SYLLABUS FOR MODULAR PATTERN
OF
CRAFT INSTRUCTOR TRANING SCHEME
TRADE:-DRAUGHTSMAN MECHANICAL, DRAUGHTSMAN CIVIL & READING OF DRAWING AND ARITHMETIC

MODULE : ENGINEERING TECHNOLOGY (ET)

WEEK NO.	W/S. SCIENCE	W/S. CALCULATION
1.	Fundamental Units, Scalar quantity & Vector quantity. Different system of units : F.P.S., C.G.S., M.K.S. and S.I. Relationship, Calculation, applications. Definition of Mass, weight, volume, density, sp. gravity & related calculations.	Concept of Fraction, Numbers, Variable, Constant. Multiplying factors such as giga, mega, kilo, milli, micro, nano, pico. Various Number Systems : Decimal, Binary, Octal & Hexadecimal.
2.	Engineering Materials - Introduction, Physical / Mechanical Properties, use; difference between metal and nonmetal, ferrous and non-ferrous; alloys- Ferrous and non-ferrous, properties and uses. Non metallic Engineering materials- Plastic, rubber, Ceramic, industrial adhesive-Properties, uses, machinability of Engineering Materials.	Introduction to basic mathematics such as average / mean, ratio & proportion, percentage, simple /compound interest, profit & loss for solving day-to-day problems- applications in engineering problems.
3.	Heat & Temperature:- Concept, difference, effects of heat, measurement units, relation, specific heats, thermal capacity, latent heat, water and Mechanical	Fundamental Algebraic formulae for multiplication and factorization, Simple & simultaneous equations, Quadratic equation, Logarithm

	equivalent of heat. Different temperature measuring scales and their relation. Transference of heat – Conduction, Convection and Radiation. Expansion / contraction of solids, liquids and gases and its effects. Charles's law, Boyle's law.	and its application in shop / trade related problems, charts & use.
4.	Newton's laws of motion, displacement, velocity, accelerations, retardations, rest & motion such as linear, angular. Force – units, different laws, composition and resolution, condition / laws of equilibrium of forces in plane, moment of inertia, torque.	Determination of sides and areas of triangles, regular and irregular polygons, circle, segment of sector. Determination of surface areas and volumes of cylinder, cube, prism pyramid, cone, sphere etc.
5.	Work, power & Energy- Definitions, types, units, calculation & application. Meaning of horse power, use of S.I. unit of power and their relation.	Trigonometry : trigonometric ratios, trigonometric tables, solution of triangles, area of polygons. Calculation of height and distance with the help of trigonometric formulae.
6.	Friction- concept, laws, effect, types, calculations and application. Corrosion : Introduction, cause & prevention. Lubricant : introduction, types & its uses, lubrication process. Additives and its importance.	Volume estimate related to civil work. Center of Gravity & moment of inertia of different solid sections. Structural Analysis of perfect frames such as simple trusses.
7.	Concept of Stress, strain, Hook's Law, Modulus of elasticity, relation and application, Yield point, factor of safety, Poisson's ratio. Bending moment and shearing force.	Application & calculation on simply supported beams and cantilevers with dead load, uniformly distributed loads. B.M & S.F. diagrams.
8.	Simple machines : inclined plane, lever, pulley, screw jack, worm & worm wheel, sprocket, rack & pinion. Gear Train - Mechanical advantage, velocity ratio & Mechanical efficiency – relations. Transmission of Power : Belt- pulley,	Calculation on speed, feed, depth of cut, tool signature, Tap – drill size. Calculation on the elements- revolution of wheels, power transmission, belt & pulley drive, determination of length of belt.

	chain & Gear drive.	
9.	Heat Treatment – Introduction, Purpose & parameters, iron carbon equilibrium diagram and TTT diagram. Different methods of Heat Treatment and their purpose.	Estimation Introduction importance, calculation of Machining time for simple turning, shaping, drilling, Milling, grinding etc. and gear train calculation.
10.	Electricity – Basic concept, effects, safety, ac & dc. Definitions & units of emf, potential difference, resistance, inductance & capacitance. Application of switches, fuses and their rating. Ohm's Law – relation between V, I & R & its related calculations. Electrical circuits – series and parallel & their combination, and calculation. Conductor , Semi conductor and insulator : concept, importance & use.	Estimation of power consumption and depreciation of machines, tools & equipments : different methods.
11.	Electrical power & Energy : units and calculation, Faraday's laws of electro magnetic induction - statement, explanations and application. Magnetism – properties, types of magnetic substances, poles, lines of force, magnetic field, magnetization, earth's magnetism.	Graphs : basic concepts , importance. Plotting of graphs of simple linear equation and application. Charts : Pie chart, Bar chart, Line diagram, Histogram.
12.	Calculus : Number system, continuity, limit, function, simple differentiation & integration. Concepts of differential equation.	Statistics : Definition, mean, median, mode, frequency & frequency polygon and standard deviation. Concept of probability.
13.	Revision & Final Test.	