

# SYLLABUS



ON

## **ENGINEERING TECHNOLOGY (ET)** **3-MONTHS MODULE**

**FOR**

**MECHANIC MOTOR VEHICLE.  
MECHANIC REF. & AIR CONDITIONING.  
MECHANIC AGRICULTURAL MACHINERY.**

**FOR**

**CRAFT INSTRUCTOR TRAINING SCHEME.**

**List of members attended the workshop for designing the syllabus on  
“ ENGINEERING TECHNOLOGY (ET)” for Mechanic Motor  
Vehicle, Mechanic Ref. & Air Conditioning and Mechanic  
Agricultural Machinery under Craft Instructor Training Scheme on  
28.05.2009 at ATI Gill Road Ludhiana.**

Sl. No	Name of member & Designation S/Sri...	Representing Organization with address	
1	Dinesh Kumar Nijhawan, Director	ATI, Ludhiana	Chairman
2	C.P.Sharma, Jt. Director	ATI, Ludhiana	Member
3	Sukhdev Singh , DDT	ATI, Ludhiana	Member
4	Gurcharan Singh, ADT	ATI, Ludhiana	Member
5	Baljinder Singh, Principal	ITI, Ludhiana	Member
6	V.K.Bansal, Principal	ITI Patiala	Member
7	Rajesh Sharma, C.I.	ITI Patiala	Member
8	Subhash Gupta, C.I.	ITI Patiala	Member
9	P.S. Kharbanda, Ex.ADT	ATI, Ludhiana	Member
10	M.R.Sharda, Trg. Officer	ATI, Ludhiana	Member
11	Jagdish Singh, ADT	ATI, Ludhiana	Member
12	Vipan Kumar, Trg. Officer	ATI, Ludhiana	Member
13	Harbans Singh, Trg. Officer	ATI, Ludhiana	Member
14	Vijay Kumar, Trg. Officer	ATI, Ludhiana	Member
15	P.L.Arora	Munjal Castings (Hero Group) Ludhiana	Member
16	Karnail Singh, Trg. Officer	ATI, Ludhiana	Member
17	Manish Gossain	Bhagat FORD, Ludhiana.	Member
18	P.K.Aggarwal	Vardhman Textile Ltd. Ludhiana.	Member
19	Harmet Singh	Gulzar Motor Ltd. G.T.Road, Dholewal, Ludhiana.	Member
20	Sat Pal, Asstt. Director (Mech.)	MSME, D1, Ludhiana	Member
21	Harbans Lal , Trg. Officer	ATI, Ludhiana	Member

# "ENGINEERING DRAWING"

## AVAILABLE SESSIONS:

1. Monday to Friday 5 days X 4 sessions = 20 Sessions/Week.  
(Each session of One hour duration).

2. Total sessions 20x13 weeks = 260 Sessions.

3. Admissions, Revision & Final Test = 40 Sessions.

4. Available sessions 260-40 = 220 Sessions.

## EVALUATION SCHEME:

	Full Marks	Pass Marks
1. Engg. Drawing (Theory) =	50	30
2. Engg. Drawing ( Sessional) =	25	15

**Syllabus of**  
**“ENGINEERING DRAWING”**

<b>WEEK No.</b>	<b>TOPICS</b>
<b>1</b>	Introduction of Engg. Drg, Drg sheets-Pencils-Drawing instruments used in Engg. Drg.-its care and maintenance. Lettering practice-free hand lining practice (Horizontal, Vertical & Inclined) – Types of lines and their uses as per IS 696-1972. Scale –Types of scale. Familiarization with computer application in engineering drawing.
<b>2</b>	Plane and Solid figures-triangles-quadrilateral-circle-cube-prisms-cylinder-pyramid-cone-sphere. Practice on computer. Conventional symbols of materials used in Engg. Drawing as per BIS.
<b>3</b>	Dimensioning-types of dimensioning-methods of dimensioning on isometric views as per BIS. Practice on computer.
<b>4 &amp; 5</b>	Isometric views- isometric views with square, taper and radial surface with dimensions-simple & complex views. Perspective views. Introduction to auto CAD.

6 & 7	Orthographic projections-types of projection- 1 <sup>st</sup> angle & 3 <sup>rd</sup> angle orthographic projections. Practice on AUTO CAD.
8	Free hand sketching of machine parts- tracing & printing of drawing.
9	Sectioning- full section-half section- offset section-revolved section-removed section – broken section. Practice on AUTO CAD.
10	Fastening devices-Nuts-bolts-keys-washers-cotters and Rivets. Universal joint and couplings.
11	Free hand sketching of tools, components & machinery used in the related trades. 3D modeling concepts.
12	Reading of engineering drawing and machine drawing – application of convention and symbols as per BIS. 3D modeling concepts.
13	<b>REVISION AND FINAL TEST</b>

**LIST OF TOOLS & EQUIPMENTS FOR A BATCH OF 30 TRAINEES.**

SL	NAME OF THE TOOLS & EQUIPMENT	Quantity
1	Drawing board size-“ D 1 “	30 Nos.
2	Drawing Instruments box	30Nos.
3	Drawing table	30Nos.
4	Drawing chair	30 Nos.
5	Mini drafter	30 Nos.
6	Cup board Big	One
7	Cup board small	One
8	Lap-top (Latest)	One
9	Laser Printer- A3 size	One
10	P C with UPS 600 VA (Latest), with tables and chairs	10 Nos.
11	LCD Projector	One
12	White board size 8'x4'	One
13	Training officer table	One
14	Training officer chair	3 Nos.
15	Laser pointer	One
16	Lecture stand (wooden)	One
17	Trainees locker with 8 compartment	Four Nos.
18	White screen for LCD	One
19	Internet connection	
20	Plotter –A3 size	One
21	AUTO CAD lab (A/C Equipped)	
22	AUTO CAD soft ware (latest)	One
23	Models – Solid and cut section.	As required

## “W/Cal & Science”

### AVAILABLE SESSIONS:

1. Monday to Friday 5 days X 4 sessions = 20 Sessions/Week.  
(Each session of One hour duration).
2. Total sessions 20x13 weeks = 260 Sessions.
3. Admissions, Revision & Final Test = 40 Sessions.
4. Available sessions 260-40 = 220 Sessions.

### EVALUATION SCHEME:

	Full Marks	Pass Marks
1. W/Cal & Science (Theory)	= 50	30
2. W/Cal & Science (Sessional)	= 25	15

**SYLLABUS  
OF  
WORKSHOP CALCULATION & SCIENCE**

WEEK NO.	TOPICS
1.	Simplification of Fraction and Decimals-Addition, Subtraction, Multiplication and Division-Conversion and measurement-MKS, CGS, FPS and SI units-Fundamentals and derived units.
2.	Square & Square roots-Problems based on square and square roots. Algebraic-addition, subtraction, multiplication and division-simultaneous equations- Quadratic equations. Logarithms-Application of logarithms.
3.	Force, Pressure, Pascal's Law, Laws of motion, Stress, Strain and Modulus of Elasticity. Hook's Law.
4.	Work, Power, Energy, Speed, Velocity, Acceleration and Torque -HP, IHP, BHP and FHP and related Problems.
5.	Mass, Weight, Volume, Density, Viscosity, Specific gravity and related problems.

6.	Ratio and Proportion-Direct, Indirect and mixed proportions problems based on ratio and Proportion.
7.	Heat-Temperature and conversion of scales Fahrenheit, Centigrade and Kelvin. Thermometer and Thermocouple. Heat treatment-Process of Annealing, Normalizing, Hardening and Tempering. Case Hardening Process-Carburizing, Induction hardening and Nitriding-Application and uses. Transmission of Heat.
8. & 9.	Mensuration-Area of circle, Triangle, Polygons Surface area and Volume of Cube and Sphere, Cone, Prism, Cylinder and Hollow Cylinder. Trigonometry – Trigonometric function-standard formulae-use of trigonometric tables. Height and Distance problems.
10.	Percentage problems. Estimation and Cost of product Simple machines-Mechanical Advantage, Velocity Ratio and Efficiency.
11.	Mechanical Properties of metal-Classification of Ferrous & Non-ferrous Metal and Alloys. Friction-Types of friction-Advantages & Disadvantages of friction. Lubrication-Types of Lubricants-Properties of Lubricants.
12.	Basic Principles of Electricity-Ohm's Law-series and parallel circuits. Use of switch, Fuse, Conductor, Insulator and Semi-conductor. Earthing. Faraday's Law
13	REVISION & FINAL TEST

**LIST OF TOOLS & EQUIPMENTS FOR A BATCH OF 30 TRAINEES.**

<b>SL</b>	<b>TOOLS &amp; EQUIPMENT</b>	<b>Quantity</b>
1	Table for trainees	30 Nos.
2	Chair for trainees	30Nos.
3	Cup board Big	One
4	Lap-top (Latest)/PC with UPS 600VA	One.
5	Laser Printer- A4 size	One.
6	LCD Projector	One
7	White board size 8'x4'	One
8	Laser pointer	One
9	Lecture stand (wooden)	One
10	Trainees locker with 8 compartment	4 Nos.
11	White screen for LCD	One
12	Training officer table	One
13	Training officer chair	One
14	Internet connection	