

# Manorama Industrial Training Institute



**Address: - Rani Talab, Sabour road, Bhagalpur, 813210**

## **A unit of Manorma Group of Education**

**Head Office:- Rani Talab, Sabour road, Bhagalpur, 813210**

**It runs under the Disha Education & Social welfare Trust**

**Registration No: - 537/4/7/81-93/CD-34/107**

**We prefer all type of Education to Children**

**Available Trade: - 1.Electrician**

**2. Fitter**

- 1. Placement (Campus Selection)**
- 2. Apprenticeship**
- 3. Hostel**
- 4. Library**
- 5. Scholarship**

**Website:- <http://manormagroup.com>**

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# Syllabus of Fitter



## **SYLLABUS FOR TRADE THEORY(SEMESTER-2)**

| <b>Week No.</b> | <b>Trade Theory</b>   |
|-----------------|---|
| <b>1</b>        | Safety-importance of safety and general precautions observed in a welding shop.Precautions in electric and gas welding.(Before, during, after) Introduction to safety equipment and their uses. Machines and accessories,welding transformer,welding generators.  |
| <b>2</b>        | Hand tools: Hammers, welding description,types and uses,description,principle, method of operating, carbon dioxide welding. H.P. welding equipment: description, principle, method of operating L.P. welding equipment: description, Principle, method of operating. Types of Joints- Butt and Fillet as per BIS SP: 46-1988 specifications. Gases and gas cylinder description, kinds, main difference and uses.   |
| <b>3</b>        | Setting up parameters for arc welding machines- selection of Welding electrodes   |
| <b>4</b>        | Oxygen acetylene cutting-machine description, parts, uses, method of handling, cutting torch- description,parts, function and uses.   |
| <b>5</b>        | Drill- material, types, (Taper shank, straight shank) parts and sizes. Drill angle- cutting angle for different materials, cutting speed feed. R.P.M. for different materials. Drill holding devices- material, construction, construction and their uses.  |
| <b>6</b>        | Counter sink, counter bore and spot facing- tools and nomenclature, Reamer- material, types (Hand and machine reamer ), kinds, parts and their uses, determining hole size ( or reaming ), Reaming procedure. Screw threads: terminology, parts, types and their uses. Screw pitch gage: material parts and uses. Taps British standard ( B.S.W. B.S.F. B.A & B.S.P )and metric / BIS (course and fine ) material, parts (shank body, flute, cutting edge). Tap wrench: material, parts, types ( solid & adjustable types ) and their uses removal of broken tap, studs (tap stud extractor). |
| <b>7</b>        | Dies : British standard, metric and BIS standard, material, parts, types, Method of using dies. Die stock: material, parts and uses.  |
| <b>8</b>        | Drill troubles : causes and remedy. Equality of lips, correct clearance, dead centre, length of lips. Drill kinds: Fraction, metric, letters and numbers, grinding of drill.  |
| <b>9</b>        | Grinding wheel: Abrasive, grade structures, bond, specification, use mounting and dressing. Bench grinder parts and use-radius gauge, fillet gauge, material, construction, partsfunction and metric, different dimensions, convex and concave uses care and maintenance.   |
| <b>10</b>       | Radius gauge, feeler gauge, hole gauge, and their uses.   |

|         |  |
|---------|--|
| 11      | Interchangeability:Necessity in Engg. Field definition, BIS. Definition, types of limit, terminology of limit and fits-basic size, actual size, deviation, high and low limit, zero line,tolerance zone Different standard systems of fits and limits. British standard system, BIS system.                          |
| 12      | Method of expressing tolerance as per BIS Fits: Definition, types description of each with sketch. Vernier height gauge: material construction, parts, graduations (English & Metric) uses, care and maintenance, Pig Iron: manufacturing process (by using ) Blast furnace types, of pig Iron, properties and uses. |
| 13      | Cast Iron: manufacturing process by using (cupola furnace ) types, properties and uses.Wrought iron-: manufacturing process ( Fuddling and Astor process ) properties and uses. Steel:manufacturing process plain carbon steel, types, properties and uses.  |
| 14      | Non-ferrous metals (copper, aluminium, tin, lead, zinc) properties and uses.   |
| 15      | Counter sink, counter bore and spot facing- tools and nomenclature, Reamer- material, types (Hand and machine reamer ), kinds, parts and their uses, determining hole size ( or reaming ), Reaming procedure.  |
| 16      | Simple scraper- cir.,flat, half round, tringular and hook scraper and their uses. Blue matching of scraped surfaces ( flat and curved bearing surfaces )   |
| 17      | Vernier micrometer, material, parts, graduation, use, care and maintenance. Calibration of measuring instruments. Introduction to mechanical fasteners and its uses. Screw thread micrometer: Construction, graduation and use.  |
| 18      | Dial test indicator, construction, parts, material,graduation, Method of use,. Care and maintenance. Digital dial indicator. Comparators- measurement of quality in the cylinder bores.  |
| 19 & 20 | Preventive maintenance-objective and function of P.M., section inspection. Visual and detailed, Lubrication survey, system of symbol and colour coding. Revision, simple estimation of materials, use of hand books and reference table. Possible causes for assembly failures and remedies.                         |
| 21      | Assembling techniques such as aligning, bending, fixing, mechanical jointing, threaded jointing, sealing, and torquing. Dowel pins: material, construction, types, accuracy and uses.  |
| 22 & 23 | <b>Implant Training/ Project work (Work in a team )</b>  |
| 24 & 25 | <b>Revision</b>  |
| 26      | <b>Examination</b>   |

**SYLLABUS FOR TRDE PRACTICAL**

| <b>Week No.</b> | <b>Trade Practical</b>                               |
|-----------------|--|
| 1               | Step fitting and practice                            |
| 2               | Drill through hole practice                          |
| 3               | Counter boring and counter sinking practice          |
| 4               | Internal thread cutting practice                     |
| 5               | External thread cutting practice                     |
| 6               | Cutting thread by die                                |
| 7               | Angular fitting practice                             |
| 8               | Make circle by divider                               |
| 9               | T- fitting practice                                  |
| 10              | Make open fitting practice                           |
| 11              | Inside square fitter practice                        |
| 12              | Dovetail sliding fitting practice                    |
| 13              | Sliding fitting practice                             |
| 14              | Simple repair work, simple assemble of machine parts |
| 15              | Scraping on flat surface practice                    |
| 16              | Making square butt joint and I joint                 |
| 17              | Making of T fitting joint by arc welding             |
| 18              | Angular and radius fitting practice                  |
| 19              | Making simple bracket practice                       |
| 20              | Drilling, tapping practice                           |
| 21              | Counter sinking, Counter boring and Reaming practice |
| 22 & 23         | <b>Project work</b>                                  |
| 24 & 25         | <b>Practical test (Revision)</b>                     |
| 26              | <b>Examination</b>                                   |

**SYLLABUS FOR WORKSHOP SCIENCE AND CALCULATION (SEMESTER-2)**

| <b>Week No.</b>    | <b>Workshop Science and Calculation</b>   |
|--------------------|---|
| <b>1 &amp; 2</b>   | Simple machines-principle, velocity ratio, mechanical advantage, efficiency, related problems.                            |
| <b>3</b>           | Algebraic symbols, fundamental algebra operations, sign and symbols used in algebra, coefficient terms, and unlike terms. |
| <b>4</b>           | Algebraic addition, subtraction, multiplication and division.   |
| <b>5</b>           | Simple machines like winch pulley and compounding axle etc.   |
| <b>6 &amp; 7</b>   | Calculation of tap hole sizes for internal threads and blank size for cutting external threads.                           |
| <b>8</b>           | Factors and equations: Algebraic formula and solving simple equations.  |
| <b>9</b>           | Factors and different types of factorization ( LCM, HCF )   |
| <b>10</b>          | Equations simple simultaneous equation.   |
| <b>11</b>          | Simple simultaneous equation.   |
| <b>12</b>          | Application, construction and solution of problems by equation.   |
| <b>13 &amp; 14</b> | Atmospheric pressure, pressure gauge, gauge pressure and absolute pressure and their units.                               |
| <b>15</b>          | Simple problems on multiplication, division, power and root using calculator.   |
| <b>16</b>          | Power and exponent. Laws of exponent.   |
| <b>17</b>          | Relation between specific gravity and density simple experimental determination.  |
| <b>18</b>          | Geometry: Fundamental geometrical definition - angles and properties of angles, triangles, and properties of triangles.   |
| <b>19 &amp; 20</b> | Pythagoras theorem, properties of similar triangles.  |
| <b>21</b>          | Definition and units of torque. Pythagoras theorem, properties of similar triangles.                                      |
| <b>22 &amp; 23</b> | <b>Implant training/Project work ( work in a team )</b>   |
| <b>24 &amp; 25</b> | <b>Revision</b>   |
| <b>26</b>          | <b>Examination</b>  |

**SYLLABUS FOR ENGINEERING DRAWING (SEMESTER-2)**

| <b>Week No.</b> | <b>Engineering Drawing</b>  |
|-----------------|---|
| 1               | Simple sketches of trade related hand tools & measuring instruments.  |
| 2               | Introduction to Orthographic Views and its advantages.  |
| 3 & 4           | Orthographic drawing, application of both the first angle and third angle. Method of representing the drawing for simple and complex machine parts, exercises with dimensions.                              |
| 5               | Standard method of sectioning as per BIS: 46- 2003, Exercises for different sectional views on the given orthographic drawing of machine part, casting etc. Orthographic drawing in first angle projection. |
| 6               | Orthographic drawing in the first angle projection.   |
| 7, 8 & 9        | Orthographic drawing in the third angle projection.   |
| 10 & 11         | Standard method of sectioning as per BIS: 46- 2003, Exercises for different sectional views on the given orthographic drawing of machine part, casting etc.   |
| 12,13 & 14      | Conversion of isometric, oblique drawings to orthographic drawing and vice- versa. Related problems such as 'V' block oriented by various machining operations etc.   |
| 15              | Method of representing the drawings for simple and complex machine blocks given for exercise with dimensions.   |
| 16              | Reading of production drawing including machining symbol, GD & T.   |
| 17 & 18         | Surface development of simple geometrical solids like cube, rectangular block cone, pyramid, cylinder, prism etc.   |
| 19 & 20         | Interpretation of solids and conventional application of intersectional curves on drawing. Solution of NCVT test paper (preliminary )<br>Revision.  |
| 21              | Sketches for bolts, nuts, screw and other screwd members.   |
| 22 & 23         | <b>Implant training/Project work ( work in a team )</b>   |
| 24 & 25         | <b>Revision</b>   |
| 26              | <b>Examination</b>  |

## SYLLABUS FOR EMPLOYABILITY SKILLS (SEMESTER-2)

### 1. Entrepreneurship skill

|                                |   |
|--------------------------------|---|
| <b>Business &amp; Consumer</b> | Types of business in different trades and the importance of skill, Understanding the consumer, market through consumer behavior, market survey, Methods of Marketing, publicity and advertisement |
| <b>Self Employment</b>         | Need and scope for self-employment, Qualities of a good Entrepreneur ( Values, attitude, motive, etc. ), SWOT and Risk Analysis.  |
| <b>Govt. Institutions</b>      | Role of various Schemes and Institutes for self- employment i.e. DIC, SIDBI, MSME, NSIC, Financial institutions and banks.  |
| <b>Initiation Formalities</b>  | Project Formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment Procedure - Lone Procurement - Agencies - banking Process                                      |

### 2. Environment Education

|                            |   |
|----------------------------|---|
| <b>Ecosystem</b>           | Introduction to Environment, Relationship Between Society and Environment, Ecosystem and Factors responsible for destruction. |
| <b>Pollution</b>           | Pollution and pollutant including liquid, gaseous, solid and hazardous waste.   |
| <b>Energy Conservation</b> | Conservation of Energy, re- use and recycle.  |
| <b>Global warming</b>      | Global warming, climate change and Ozone layer depletion.   |
| <b>Ground water</b>        | Hydrological cycle, ground and surface water and treatment of water.  |
| <b>Environment</b>         | Right attitude towards environment, Maintenance of in-house environment.  |

### 3. Occupational Safety, Health & Environment

|                              |  |
|------------------------------|--|
| <b>Safety &amp; Health</b>   | Introduction to Occupational Safety and Health and its importance at workplace               |
| <b>Occupational Hazards</b>  | Occupational health, Occupational hygiene, Occupational Diseases/ Disorders & its prevention |
| <b>Accident &amp; safety</b> | Accident prevention techniques - control of accident and safety measures                     |
| <b>First Aid</b>             | Care of injured & Sick at the workplace, First-aid & Transportation of sick person           |
| <b>Basic Provisions</b>      | Idea of basic provisions of safety, health, welfare under legislation of India               |



#### **4. Labour Welfare Legislation**

##### **Welfare Acts**

Benefits guaranteed under various acts- Factories Act, Appernticeship Act, Employees state Insurece Act ( ESI ), Payment Wages Act, Employees Provident Fund Act, Workmen's Compensation Act

#### **5. Quality Tools**

##### **Quality Consciousness**

Meaning of quality, Quality Characteristic

##### **Quality Circles**

Definition, Advantage of small group activity, objectives of Quality Circle, Roles and Functions of Quality Circles in organisation, Operation of Quality Circle, Approaches to Starting Quality Circles, Steps for Continuation Quality Circles

##### **Quality Management System**

Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.

##### **House Keeping**

Porpose of Housekeeping, Practice of good Housekeeping. 5S Principles of Housekeeping: SEIRI - Segregation, SEITON - Arrangement, SEISO- Cleaning, SEIKETSU - maintenance of Sandards, SHITSUKE- Discipline.