**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

**N - SCHEME**

**(Implements from the Academic year 2019-2020 onwards)**

Course Name : All branches of Diploma in Engineering and Technology and Special

Programmes except DMOP, HMCT and film & TV.

Subject Code : 40025

Semester : II Semester

Subject Title : **ENGINEERING DRAWING**

**TEACHING AND SCHEME OF EXAMINATION:**

**No. of weeks per semester: 15 weeks**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Subject | Instructions | | Examination | | | |
| Hours / Week | Hours / Semester | Marks | | | Duration |
| ENGINEERING DRAWING | 6 Hrs | 90 Hrs | Internal  Assessment | Board Examination | Total |
| 25 | 75 | 100 | 3 Hrs |

**Topics and Allocation of Hours:**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Topic** | **Time** |
| 1 | Projection of Points, Straight Lines and Planes | 18 Hrs |
| 2 | Projection of Solids and Section of Solids | 18 Hrs |
| 3 | Development of Surfaces | 21 Hrs |
| 4 | Missing views and Isometric Projections | 21 Hrs |
| 5 | Revision and Tests | 12 Hrs |
|  | **Total** | **90 Hrs** |

**RATIONALE:**

Engineering drawing is a basic subject for all branches of Diploma in Engineering and Technology. Since engineering drawing is considered as the language of engineers, the proper understanding and practice is required with the use of proper drawing instruments.

This subject is aimed at providing basic understanding of the fundamentals of engineering drawings mainly visualization of three dimensional drawings for practical applications and the use of drawings in real life engineering applications.

The topics covered are based on the syllabus for Diploma studies in engineering. The subject is planned to include sufficient practice which would help the students in visualization of three dimensional objects and developing the drawing.

The chapters are arranged in sequence and starts from the basic concepts of projection of points, straight lines, solids and section of solids. It proceeds to the construction of development of surfaces and isometric projections. By the end of the subject, it is expected that the students would be matured to visualize engineering components by reading an engineering drawing.

**OBJECTIVES:**

At the end of the practice, the students will be able to,

* Understand the importance of drawing.
* Identify and use of the drawing instruments.
* Understand the concepts of projection of points and straight lines.
* Draw the projection of solids and section of solids.
* Draw the development of solids and objects.
* Draw the missing views from the given drawing.
* Convert orthographic views into isometric drawings.

**Note:** While practicing in drawing sheets (A2 size), use of drawing instruments like drawing board, mini drafter, compass, divider, drawing clips / cello tape, H, 2H and HB grade drawing pencils, eraser etc., are mandatory for class work and examinations.

**40025 ENGINEERING DRAWING**

**DETAILED SYLLABUS**

**Theory Contents**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Name of the Topic** | **Hours** |
| **1** | **PROJECTION OF POINTS, STRAIGHT LINES AND PLANES**  **1.1 PROJECTION OF POINTS**  Projection of points – position of a point on four quadrants and on the reference planes – system of notation – Place a point on four quadrants with different distances – exercises (minimum 5 points).   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises | | 1 | 2 |     **1.2 PROJECTION OF STRAIGHT LINES AND PLANES**  Projection of straight lines – line in the first quadrant and on the reference planes – parallel to one plane and perpendicular to other plane – inclined to one plane and parallel to the other plane – parallel to both the planes – simple exercises.  Projection of planes – triangle, rectangle, hexagon and circle – plane parallel to HP and perpendicular to VP – plane parallel to VP and perpendicular to HP – plane perpendicular to both HP and VP – simple exercises.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises covering all portions | | 1 | 10 | | **06 Hrs**  **12 Hrs** |
| **2** | **PROJECTION OF SOLIDS AND SECTION OF SOLIDS**  **2.1 PROJECTION OF SOLIDS**  Introduction – important terms – classification of solids – triangular, cube, pentagonal and hexagonal prisms and pyramids – solids of revolution – cylinder and cone – projection of solids in simple positions – axis parallel to one plane and perpendicular to other plane.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises covering all portions | | 1 | 6 |   **2.2 PROJECTION AND SECTION OF SOLIDS**  **2.2.1 Projection of solids:** position of solid – axis inclined to one plane and parallel to other plane – axis parallel to both planes – simple exercises.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises covering all portions | | 1 | 5 |     **2.2.2 Section of solids:** Need for section view – cutting plane – cutting plane line – representation as per BIS code – Hatching line – true section – section of simple solids – prism, pyramid, cylinder, cone – position of solids – axis perpendicular to one plane and parallel to other plane – position of cutting planes – cutting plane perpendicular to one plane and parallel to another plane – cutting plane perpendicular to one plane and inclined to another plane – true shape – exercises.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises covering all portions | | 2 | 6 | | **06 Hrs**  **12 Hrs** |
| **3** | **DEVELOPMENT OF SURFACES**  **3.1** Need for preparing development drawing with reference to sheet metal work – procedure for preparing development drawing of prism, pyramid, cylinder and cone – exercises in rectangular, square and hexagonal prisms and pyramids – exercises in regular cylinder and cone.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises covering all portions | | 1 | 6 |     **3.2** Cutting plane – cutting plane line – development of truncated prism, pyramid, cylinder and cone – frustum of pyramid and cone – development of simple components such as elbow, ducts, lamp shade and funnel.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises covering all portions | | 3 | 10 | | **09 Hrs**  **12 Hrs** |
| **4** | **MISSING VIEWS AND ISOMETRIC PROJECTIONS**  **4.1** **MISSING VIEWS:** Reading a drawing – missing views – visualization – possible view problems – Drawing a missing view or third view – simple exercises.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises | | 1 | 6 |     **4.2** **ISOMETRIC PROJECTIONS:** Introduction – isometric view – isometric projection – methods of drawing an isometric view – box method – construction of arcs and circles – four centre method for drawing ellipse – construction of isometric drawing of components from the given orthographic views – simple exercises.   |  |  | | --- | --- | | Minimum criteria for class assessment | | | No. of Drawing sheets | No. of Exercises | | 1 | 8 | | **06 Hrs**  **15 Hrs** |

**Text Books:**

1. Bhatt N.D. and Panchal V.M., “Engineering Drawing”, Charotar Publishing House, 50th Edn, 2010.

2. Gill P.S., “Engineering drawing”, S.K.Kataria & Sons, 11th Edition, 2012..

**Reference Books:**

1. Gopalakrishna.K.R., "Engineering Drawing", (Vol.I and II combined), Subhas Publications, 2014.

2. Venugopal.K, Prabhu Raja. V, “Engineering Graphics”, NewAge International Publishers, 11th Edn, 2011.

3. Nataraajan K V “A Text Book of Engineering Drawing and Graphics”

4. Shah M B, Rana B C, “Engineering Drawing”, Second Edition, 2009, Pearson.

5. Besant Agrawal, C M Agrawal “Engineering drawing”, Tata McGraw Hill Education Pvt. Ltd., 2010.

6. Barkinson & Sinha, "First Year Engineering Drawing", Pitman Publishers.

7. Thomas E. French, Charles J. Vierck, “Fundamentals of Engineering Drawing”, McGraw Hill Book Company.Inc

**BOARD EXAMINATION**

**QUESTION PAPER PATTERN**

**Time: 3 Hrs Max. Marks: 100**

Note: (i) Answer all the questions in the drawing sheet only.

(ii) Assume missing dimensions suitably

**PART – A** 4 X 5 = 20

*Answer any four questions. Each question carries five marks.*

Note: Five questions will be asked (1 to 5). At least one question from each unit.  
(Chapters : 1.1, 2.1, 3.1, 4.1)

**PART – B** 4 X 20 = 80

*Answer any four questions. Each question carries twenty marks.*

Note: Six questions will be asked (6 to 11). At least one question from each unit.

(Chapters : 1.2, 2.2, 3.2, 4.2)

**TOTAL 100 Marks**

**Internal Marks:**

|  |  |  |
| --- | --- | --- |
| **Sl. No** | **Particulars** | **Marks** |
| 1 | Evaluation of class work - ( Minimum 10 plates) | 10 |
| 2 | Continuous assessment tests (Average of two tests) (2 Hours duration) | 05 |
| 3 | Model examination (Board Exam pattern) (3 Hours duration) | 05 |
| 4 | Attendance | 05 |
|  | **Total** | **25** |