

## SEMESTER S1

### ENGINEERING GRAPHICS AND COMPUTER AIDED DRAWING

|                                            |                  |                    |                |
|--------------------------------------------|------------------|--------------------|----------------|
| <b>Course Code</b>                         | <b>A103EST03</b> | <b>CIE Marks</b>   | 40             |
| <b>Teaching Hours/Week<br/>(L: T:P: R)</b> | 2-0-2-0          | <b>ESE Marks</b>   | 60             |
| <b>Credits</b>                             | 3                | <b>Exam Hours</b>  | 2 Hrs. 30 Min. |
| <b>Prerequisites (if any)</b>              | None             | <b>Course Type</b> | Theory & Lab   |

#### Course Objectives:

1. To learn the principles and techniques of dimensioning and preparing engineering drawings.
2. To develop the ability to accurately interpret and understand engineering drawings.
3. To learn the features of CAD software

### SYLLABUS

| <b>Module No.</b> | <b>Syllabus Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Contact Hours</b> |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>1</b>          | <b>Introduction:</b> Relevance of technical drawing in engineering field. Types of lines, Dimensioning, BIS code of practice for technical drawing. (No questions for the end semester examination)<br><br>Projection of points in different quadrants, Projection of straight lines inclined to one plane and inclined to both planes. Trace of a line. Inclination of lines with reference planes. True length and true inclinations of line inclined to both the reference planes. | <b>9</b>             |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                   |          |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>2</b> | Projection of Simple solids such as Triangular, Rectangle, Square, Pentagonal and Hexagonal Prisms, Pyramids, Cone and Cylinder only. Projection of solids in simple position including profile view. Projection of solids with axis inclined to one of the reference planes and with axis inclined to both reference planes.                                                                                     | <b>9</b> |
| <b>3</b> | <p><b>Sections of Solids:</b> Sections of Prisms, Pyramids, Cone and Cylinder only, with axis in vertical position and cut by different section planes. True shape of the sections. (Exclude true shape given problems)</p> <p><b>Development of Surfaces:</b> Development of surfaces of the solids and solids cut by different section planes. (Exclude problems with through holes)</p>                        | <b>9</b> |
| <b>4</b> | <p><b>Isometric Projection:</b> Isometric scale- Isometric View and Projections of Prisms, Pyramids, Cone, Cylinder, Sphere, Hemisphere and their combinations.</p> <p><b>Computer Aided Drawing (CAD):</b> Introduction, Role of CAD in design and development of new products, Advantages of CAD. Creating two-dimensional drawing with dimensions using suitable software. (CAD, only internal evaluation)</p> | <b>9</b> |

**Course Assessment Method**  
(CIE: 40 marks, ESE: 60 marks)

**Continuous Internal Evaluation Marks (CIE):**

| <b>Attendance</b> | <b>Assignment+<br/>Lab Exam</b> | <b>Internal<br/>Examination-1</b> | <b>Internal<br/>Examination- 2</b> | <b>Total</b> |
|-------------------|---------------------------------|-----------------------------------|------------------------------------|--------------|
| <b>5</b>          | <b>10+5</b>                     | <b>10</b>                         | <b>10</b>                          | <b>40</b>    |

## End Semester Examination Marks (ESE)

*Student can choose any one full question out of two questions from each module*

|                                                                                  |              |
|----------------------------------------------------------------------------------|--------------|
| <b>2 Questions from one module.</b>                                              | <b>Total</b> |
| Total 8 Questions, each question carries 15 marks<br><br><b>(15x4 =60 marks)</b> | <b>60</b>    |

## Course Outcomes (COs)

At the end of the course students should be able to:

| Course Outcome |                                                                                                  | Bloom's Knowledge Level (KL) |
|----------------|--------------------------------------------------------------------------------------------------|------------------------------|
| <b>CO1</b>     | Draw the projection of points and lines located in different quadrants                           | <b>K2</b>                    |
| <b>CO2</b>     | Prepare Multiview orthographic projections of objects by visualizing them in different positions | <b>K3</b>                    |
| <b>CO3</b>     | Draw sectional view and develop surfaces of given object                                         | <b>K3</b>                    |
| <b>CO4</b>     | Prepare pictorial drawings using the principles of isometric projections                         | <b>K3</b>                    |
| <b>CO5</b>     | Sketch simple drawing using CAD tools.                                                           | <b>K3</b>                    |

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

## CO-PO Mapping Table:

|            | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| <b>CO1</b> | H   | M   |     |     |     |     |     |     |     |      |      |
| <b>CO2</b> | H   | M   |     |     |     |     |     |     |     |      | M    |
| <b>CO3</b> | H   | M   |     |     |     |     |     |     |     |      |      |
| <b>CO4</b> | H   | M   |     |     |     | M   |     |     | M   |      |      |
| <b>CO5</b> | H   | M   | M   |     | H   |     |     | M   | H   |      |      |

| <b>Text Books</b> |                          |                             |                                    |                         |
|-------------------|--------------------------|-----------------------------|------------------------------------|-------------------------|
| <b>Sl. No</b>     | <b>Title of the Book</b> | <b>Name of the Author/s</b> | <b>Name of the Publisher</b>       | <b>Edition and Year</b> |
| <b>1</b>          | Engineering Graphics     | Varghese, P. I.             | V I P Publishers                   | 2018 edn                |
| <b>2</b>          | Engineering Graphics,    | Benjamin, J.                | Pentex Publishers                  | 2016 edn                |
| <b>3</b>          | Engineering Graphics     | John, K. C.                 | Prentice Hall India Publishers     | 2017 edn                |
| <b>4</b>          | Engineering Drawing,     | Bhatt, N., D.               | Charotar Publishing House Pvt Ltd. | 60th edn<br>2019        |
| <b>5</b>          | Engineering Graphics,    | Anilkumar, K. N.            | Adhyuth Narayan Publishers         | 2022 edn                |

| <b>Reference Books</b> |                                    |                                                    |                                  |                         |
|------------------------|------------------------------------|----------------------------------------------------|----------------------------------|-------------------------|
| <b>Sl. No</b>          | <b>Title of the Book</b>           | <b>Name of the Author/s</b>                        | <b>Name of the Publisher</b>     | <b>Edition and Year</b> |
| <b>1</b>               | Engineering Graphics with AutoCAD, | Kulkarni, D. M., Rastogi, A. P. and Sarkar, A. K., | Prentice Hall India Publishers   | 2020                    |
| <b>2</b>               | Engineering Drawing & Graphics     | Venugopal, K.                                      | New Age International Publishers | 5th edn 2011            |
| <b>3</b>               | Engineering Drawing                | Parthasarathy, N. S., and Murali, V.               | Oxford University Press          | 2015 edn                |

| <b>Video Links (NPTEL, SWAYAM...)</b> |                                                                                                                             |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Module No.</b>                     | <b>Link ID</b>                                                                                                              |
| <b>1</b>                              | <a href="https://archive.nptel.ac.in/courses/112/102/112102304/">https://archive.nptel.ac.in/courses/112/102/112102304/</a> |
| <b>2</b>                              | <a href="https://archive.nptel.ac.in/courses/112/102/112102304/">https://archive.nptel.ac.in/courses/112/102/112102304/</a> |
| <b>3</b>                              | <a href="https://archive.nptel.ac.in/courses/112/102/112102304/">https://archive.nptel.ac.in/courses/112/102/112102304/</a> |
| <b>4</b>                              | <a href="https://archive.nptel.ac.in/courses/112/102/112102304/">https://archive.nptel.ac.in/courses/112/102/112102304/</a> |