

|                                 |                                                      |
|---------------------------------|------------------------------------------------------|
| <b>Subject Code: 1ET4020306</b> | <b>Subject Title: Computer Aided Machine Drawing</b> |
| <b>Pre-Requisite</b>            | --                                                   |

### **RATIONALE:**

Industrial activity of Mechanical Engineers are mainly involved in drafting, manufacturing, inspection and planning like preparing process plans, preparing bill of materials etc For all such activities, reference document is the drawing of component/assembly to be manufactured.

As Drawing is second language for Mechanical Engineer, it is of utmost importance to prepare, read and interpret these drawings correctly for production of components and assemblies accurately and precisely.

### **COURSE OBJECTIVE:**

The subject caters drafting practices, symbols, codes, norms and standards generally used in industries. Now a days the market driven economy demands frequent changes in product design to suit the customer needs. With the introduction of computers the task of incorporating frequent changes as per requirement is becoming simpler. This course has been introduced at Diploma level in order to develop the skills in student so that they can generate various digital production drawings as required in industry using various CAD software.

### **TEACHING AND EXAMINATION SCHEME:**

| <b>Teaching Scheme (Hours per week)</b> |                 |                  |               | <b>Evaluation Scheme (Marks)</b> |                              |                              |                              |
|-----------------------------------------|-----------------|------------------|---------------|----------------------------------|------------------------------|------------------------------|------------------------------|
| <b>Lecture</b>                          | <b>Tutorial</b> | <b>Practical</b> | <b>Credit</b> | <b>Theory</b>                    |                              | <b>Practical</b>             |                              |
|                                         |                 |                  |               | <b>University Assessment</b>     | <b>Continuous Assessment</b> | <b>University Assessment</b> | <b>Continuous assessment</b> |
| -                                       | -               | 4                | 2             | -                                | -                            | 20                           | 30                           |

**SUBJECT CONTENTS:**

| SR NO | TOPIC                                                                                                                                                                                                                                                                                                                                                                                                                                      | TOTAL HOURS | WEIGHTAGE % |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| 1     | <b>Introduction:</b> <ol style="list-style-type: none"> <li>Basic knowhow of computer hardware, software and peripherals.</li> <li>Concept and need of machine drawings.</li> <li>Drafting, tolerance and geometrical symbols used in machine drawing.</li> <li>AutoCAD (Mechanical) screen, library, symbols, templates in context of machine drawing.</li> <li>Drawing standards.(IS-696 /SP 46) (Drawing/printing/ storage)</li> </ol>  | 04          | 5           |
| 2     | <b>2D Production Drawings:</b> <ol style="list-style-type: none"> <li>Simple 2D production drawings of Mechanical components made up of minimum 5 manufacturing operations using Auto CAD - Mechanical).</li> <li>2D assembly productions drawing of any one simple mechanical assembly made up various manufacturing operations using AutoCAD - Mechanical).</li> <li>Take print outs of above drawings using Printer/plotter.</li> </ol> | 14          | 25          |
| 3     | <b>2D Parametric Drawings:</b> <ol style="list-style-type: none"> <li>Concept and examples of parametric and non parametric models.</li> <li>Concept, examples and applications of constraints and relations.</li> <li>Simple 2D parametric drawings of machine components made up of various manufacturing operations each using sketcher mode.</li> </ol>                                                                                | 10          | 20          |
| 4     | <b>3D Modeling using AutoCAD :</b> <ol style="list-style-type: none"> <li>Introduction to AutoCAD-3D features and 2D commands overview.</li> <li>D primitives-types and defining parameters.</li> <li>User coordinate system (UCS) and its options.</li> <li>3D draw commands.</li> </ol>                                                                                                                                                  | 14          | 25          |



|   |                                                                                                                                                                                                      |    |    |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
|   | 5. D modify and editing commands.<br>6. 3D viewing & views generation.<br>7. Surface modelling commands.                                                                                             |    |    |
| 5 | <b>Industrial Project Work :</b><br>a. Prepare details and assembly drawing of part of mechanical production system of Industries after industrial visit and take print out of it. (Group project ). | 14 | 25 |

### **COURSE OUTCOMES:**

Here only course outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of programme outcomes/course outcomes in affective domain as given in a common list at the beginning of curriculum document for this programme.

- i. Identify parts of computers
- ii. Knowledge of Auto-cad
- iii. Production drawing include surface roughness values, tolerances, limits, geometrical tolerances/ symbols, heat treatment/ surface treatment notes, etc.
- iv. The components and assembly for production drawing
- v. Prepare production drawings using AutoCAD and Pro-E software. ii. Interpret given production drawing/s.

### **SUGGESTED LEARNING RESOURCES:**

#### **(A) List of Books:**

| <b>Sr.No.</b> | <b>Title of Books</b>             | <b>Author</b>    | <b>Publication</b>  |
|---------------|-----------------------------------|------------------|---------------------|
| 1             | Machine Drawing including AutoCAD | Ajeet Singh      | McGraw hill         |
| 2             | Production Drawing                | K L Narayan      | New Age Publication |
| 3             | Fundamental of Geometric          | Alex Krulikowski | Cengage Learning    |

|   |                                   |             |                 |
|---|-----------------------------------|-------------|-----------------|
|   | Tolerance and dimensioning        |             |                 |
| 4 | Engineering Graphics with AutoCAD | Sarkar .A.K | PHI india       |
| 5 | AutoCAD User Guide                | Autodesk    | Autodesk Press. |

**(B) List of equipments:**

- i. CAD Workstation.
- ii. 24" colour or mono plotter.
- iii. Laser Jet printer.

**(C ) List of Software:**

- i. latest Version of Autodesk Auto CAD Mechanical.
- ii. latest Version of Modeling software.

**(D ) Learning Websites:**

- i. Autodesk Exchange/ AUGI.
- ii. PTC university tutorials.
- iii. Video tutorials from YouTube and other resources