

| MM 103E Computer Aided Technical Drawing I |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |      |                       | DEPARTMENT OF MECHANICAL ENGINEERING |                     |       |                |             |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|-----------------------|--------------------------------------|---------------------|-------|----------------|-------------|
| Semester                                   | Methods of Education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |      |                       |                                      |                     |       | Credits        |             |
|                                            | Lecture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Recit. | Lab. | Project / Field Study | Homework                             | Other               | Total | Credit         | ECTS Credit |
| 1                                          | 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 14     | 42   | -                     | 20                                   | 16                  | 120   | 3              | 4.0         |
| Language                                   | English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |      |                       |                                      |                     |       |                |             |
| Compulsory / Elective                      | Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |      |                       |                                      |                     |       |                |             |
| Prerequisites                              | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |      |                       |                                      |                     |       |                |             |
| Course Contents                            | Introduction to computer aided technical drawing. Geometrical constructions. Principles of orthographic projection; projection of principal views from three dimensional models. Drawing techniques for basic manufacturing processes and standard features. Projection of third principal view from two given principal views; free hand drawing techniques. Three dimensional drawing techniques; simple shapes, inclined surfaces, skew surfaces. Principles of dimensioning. Principles of sectioning; full and half sections. Further work on sectioning, conventional practices. Introduction to the solid modeling. |        |      |                       |                                      |                     |       |                |             |
| Course Objectives                          | The aim of this course is to get the students acquainted with the principles and use of technical drawing and computer aided drawing in below written topics                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |      |                       |                                      |                     |       |                |             |
| Learning Outcomes and Competences          | The students should be able to:<br>1. Describe the role of the engineer on a design team.<br>2. Use the basic components of a CAD workstation.<br>3. Describe the relationship between CAD and CAM.<br>4. Draw and dimension some basic machine components properly.                                                                                                                                                                                                                                                                                                                                                       |        |      |                       |                                      |                     |       |                |             |
| Textbook and /or Reference                 | 1. Giesecke, E. Frederick, et. al., Technical Drawing (13th Edition), Prentice-Hall, Inc., Upper Saddle River, N.J., 2009.<br>2. Şen, İ.Z., ve Özçilingir, N., "Teknik Resim-Temel Bilgiler", Deha Yayıncılık, İstanbul, 2007.<br>3. Şen, İ.Z., ve Bora, H., "Bilgisayar Destekli Çizim ve Tasarım – AutoCAD 2008", Deha Yayıncılık, İstanbul, 2008.                                                                                                                                                                                                                                                                       |        |      |                       |                                      |                     |       |                |             |
| Assessment Criteria                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |      |                       |                                      | If any, mark as (x) |       | Percentage (%) |             |
|                                            | Midterm Exams                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |      |                       |                                      | X                   |       | 35             |             |
|                                            | Quizzes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |      |                       |                                      |                     |       |                |             |
|                                            | Homeworks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |      |                       |                                      | X                   |       | 20             |             |
|                                            | Projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |      |                       |                                      |                     |       |                |             |
|                                            | Term Paper                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |      |                       |                                      |                     |       |                |             |
|                                            | Laboratory Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |      |                       |                                      |                     |       |                |             |
|                                            | Other                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |      |                       |                                      | X                   |       | 5              |             |
|                                            | Final Exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |      |                       |                                      | X                   |       | 40             |             |
| Instructors                                | Assist.Prof. Nihat GEMALMAYAN, Assist.Prof. Yusuf USTA, Dr. Yavuz ZUMRUT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |      |                       |                                      |                     |       |                |             |
| Week                                       | Subject                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |      |                       |                                      |                     |       |                |             |
| 1                                          | Introduction to computer aided drawing (CAD).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |      |                       |                                      |                     |       |                |             |
| 2                                          | Geometric Constructions, AutoCAD basic commands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |      |                       |                                      |                     |       |                |             |
| 3                                          | Principles of orthographic projection. Projections of parts. Reading of drawings and obtaining the projections. AutoCAD-Basic commands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |      |                       |                                      |                     |       |                |             |
| 4                                          | Selection of Sight Direction and Views. Drawing Order.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |      |                       |                                      |                     |       |                |             |
| 5                                          | Drawing techniques for basic manufacturing processes and standard features such as castings and forgings, fillets, holes, counter bores, Counter sinks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |      |                       |                                      |                     |       |                |             |
| 6                                          | Projection of third principal view from two given views and freehand drawing techniques.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |      |                       |                                      |                     |       |                |             |
| 7                                          | Principles of dimensioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |      |                       |                                      |                     |       |                |             |
| 8                                          | Three dimensional drawing techniques. Isometric drawing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |      |                       |                                      |                     |       |                |             |
| 9                                          | Three dimensional drawing techniques. Oblique drawing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |      |                       |                                      |                     |       |                |             |
| 10                                         | MID-TERM EXAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |      |                       |                                      |                     |       |                |             |
| 11                                         | Principles of sectioning. Full and half sections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |      |                       |                                      |                     |       |                |             |
| 12                                         | Further principles of sectioning. Broken out, Rotated, Removed and Aligned sections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |      |                       |                                      |                     |       |                |             |
| 13                                         | 3D Drawing Techniques. Solid Modeling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |      |                       |                                      |                     |       |                |             |
| 14                                         | 3D Drawing Techniques. Solid Modeling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |      |                       |                                      |                     |       |                |             |