**17ME1203 - COMPUTER AIDED ENGINEERING DRAWING**

**(Common to CE and ME)**

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| **Course Category** | Engineering Science | **Credits** | 4 |
| **Course Type** | Theory | **Lecture-Tutorial-Practical** | 2 - 0 - 4 |
| **Prerequisite** | Knowledge of basic math concepts and different types of shapes, angles, symmetry, scaling and unit measurement systems. | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course**  **Objectives** | 1. To enable the students with various concepts like dimensioning, construction of conic sections, polygons, cycloids and involutes. 2. To impart and inculcate proper understanding of AutoCAD fundamentals. 3. To apply the knowledge of AutoCAD for the projections of points, lines and solids. 4. To know about sections and development of solids. 5. To improve the visualization skills with isometric projections. | |
| **Course Outcomes** | CO1 | Apply the conventions and the methods of engineering drawing. |
| CO2 | Create geometric constructions, conics with hand tools to draw lines, polygons, circle, tangencies, conic sections and irregular arcs. |
| CO3 | Sketch the solutions to the problems on projection. |
| CO4 | Use the sectioning and developments concepts of solids in actual applications. |
| CO5 | Visualize the objects that they can apply these skills in developing new products. |

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| **SCHEME OF EVALUATION** | | | | |
| **Course** | **Marks** | **Examination and Evaluation** | | **Scheme of examination** |
| **Computer Aided Engineering Drawing** | 60 | Semester end Examination for 3 hours duration (External evaluation) in the CAEG Laboratory | | 60 marks are allotted for the drawing examination during semester end. |
| 40 | 20 | Day-to-Day evaluation during the practice.  (Internal evaluation). | Marks are evaluated based on average performance of student in day-to-day exercises and finalized for 20 marks |
| 20 | Drawing examination (Internal Evaluation) | Two drawing examinations are conducted for 20 marks. 80% of better one and 20% of the other are added and finalized for 20 marks. Drawing examination-I: Shall be conducted just before I mid-term examinations.  Examination-II: Shall be conducted just before II mid-term exam. |
| **Course**  **Content** | **UNIT-I**  **GEOMETRICAL CONSTRUCTIONS, CONICS AND SPECIAL CURVES :**  **Introduction:** Importance of Drawing – Drawing instruments – Sheet layout – BIS Conventions – Types of lines –Lettering –Dimensioning methods.  **Geometrical constructions:** Regular polygons (Triangle, square, pentagon and hexagon)  **Conic sections:** Introduction – Construction of ellipse – Parabola and hyperbola using eccentricity method and rectangular/ oblong methods.  **Special curves:** Introduction –Construction of cycloids and involute curves.  **UNIT-II**  **INTRODUCTION TO CAD SOFTWARE:**  **Introduction:** Importance of computer aided drawing – Software tool environment – Drawing size and scale – Main menu –Tool bar and menus – Co-ordinate system and drafting settings.  **Creation and Editing:** Points – Lines – Poly lines – Polygons – Splines – Circle – Ellipse – Text – Move – Copy – Off-set – Pan – Mirror – Rotate – Trim – Extend – Break – Chamfer – Fillet – Curves – Block – Layers – line representations – Dimensioning – Hatching.  **UNIT-III**  **PROJECTIONS OF POINTS AND LINES:**  **Projections of points:** Principles of projections – Planes of projection – Points in four quadrants.  **Projections of lines:** Line inclined to both the principal planes (first angle projection only).  **UNIT-IV**  **PROJECTIONS OF PLANES AND SOLIDS:**  **Projections of planes:** Plane (triangle, square, rectangle, pentagon, hexagon and circular) inclined to both the principal planes.  **Projections of solids:** Solids such as Prisms – Pyramids – Cylinders – Cones  **UNIT-V**  **SECTIONS OF SOLIDS, DEVELOPMENT OF SURFACES:**  **Sections of solids:** Solids such as Prisms, Pyramids – Cylinders and cones resting on their bases on HP.  **Development of surfaces:** Lateral surfaces of solids such as prisms – Pyramids – Cylinders and cones (cut by a plane inclined to HP).  **UNIT-VI**  **ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS:**  **Isometric projections:** Isometric projections of simple objects.  **Orthographic projections:** Conversion of pictorial views into orthographic views. | | | |
| **Textbooks**  **& Reference books** | **TEXTBOOKS:**   1. Engineering Drawing, N.D. Bhat / Charotar Publishing House, Gujarat, 51st edition, 2013. 2. Sham Ticked, AutoCAD 2013 for Engineers and Designers, Dream tech Press, 2013.   **REFERENCE BOOKS:**   1. Engineering Drawing and Graphics, Venugopal K, New Age International Pvt. Ltd. New Delhi, 2001. 2. D.M. Kulkarni, A.P. Rastogi and A.K. Sarkar, Engineering Graphics with Auto CAD, PHI Learning Private Limited, Revised Edition, August 2010. 3. T.Jeyapoovan, Engineering Drawing and Graphics Using Autocad, Vikas Publishing House, 3rd Edition, 2010. 4. Jolhe, Engineering Drawing, Tata McGraw Hill Education Private Limited, 1st Edition, 2007. 5. Basant Aggarwal, Engineering Drawing, Tata McGraw Hill Education Private Limited, 1st Edition, 2008. | | | |