**19ME12P1-COMPUTER AIDED ENGINEERING DRAWING LABORATORY**

(Common to EEE, ECE, CSE and IT)

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| **Course Category:** | Engineering Science | **Credits:** | 3 |
| **Course Type:** | Practical | **Lecture-Tutorial- Practice:** | 0 - 0 - 6 |
| **Prerequisite:** | Geometrical Construction | **Sessional Evaluation:****External Evaluation :****Total Marks:** | 4060100 |

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| **Course****Objectives** | Students undergoing this course are expected to understand: |
| 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 developments of solids.
5. To improve the visualization skills with isometric projections.
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| **Course Outcomes** | Upon successful completion of the course , the students will be able to: |
| CO1 | Understand the conventions and methods of engineering drawings |
| CO2 | Sketch the solutions to the problems on projection of points, lines, planes and solids  |
| CO3 | Demonstrate orthographic and Isometric principles  |
| CO4 | Understand and apply the knowledge of engineering drawing in modern CAD tools. |
| **Course****Content****Course****Content** | **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, 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 and hatching.**GEOMETRICAL CONSTRUCTIONS, AND CONIC SECTIONS:**Importance of Drawing, Drawing Instruments, Sheet layout, BIS Conventions, Types of lines, Lettering, and dimensioning methods. **Geometrical Constructions:** Regular Polygons.**Conic Sections:** Introduction, Construction of Ellipse, Parabola and Hyperbola using Eccentricity method and Rectangular/ Oblong methods, Rectangular hyperbola.**SPECIAL CURVES:** Construction of Cycloidal curves – Cycloid, Epi-cycloid and Hypo- cycloid.Involutes – Involutes of circle and polygons.**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).**PROJECTIONS OF PLANES:****Projections of Planes:** Plane (triangle, square, rectangle, pentagon, hexagon and circular) inclined to both the principal planes.**PROJECTIONS OF SOLIDS:****Projections of Solids:** Solids such as Prisms, Pyramids, Cylinders and Cones inclined to both the principal plane.**SECTIONS OF SOLIDS.** **Sections of Solids:** Solids such as Prisms, Pyramids, Cylinders and Cones resting on their bases on HP.**DEVELOPMENT OF SURFACES.****Development of Surfaces:** Lateral surfaces of solids such as Prisms, Pyramids, Cylinders and Cones (cut by a plane inclined to HP).ISOMETRIC VIEWS AND PROJECTIONS:Isometric views of planes and solids.Isometric scale, Isometric Projections of simple objects.**ORTHOGRAPHIC PROJECTIONS:**Conversion of Pictorial views into Orthographic Views. |
| **Text Books** **and**  **Reference Books** | **TEXTBOOKS:**1. Engineering Drawing, N.D. Bhat / Charotar Publishing House,. Gujarat, 53rd edition, 2014.
2. AutoCAD 2013 For Engineers and Designers, Sham Tickoo, Dream tech Press, 2013

**REFERENCE BOOKS:**1. Engineering Drawing And Graphics + Autocad, Venugopal K, New Age International Pvt. Ltd.New Delhi, 2007.
2. Engineering Graphics with Auto CAD, D.M. Kulkarni, A.P. Rastogi and A.K. Sarkar, PHI Learning Private Limited, Revised Edition, August 2010.
3. Engineering Drawing and Graphics Using Autocad, T Jeyapoovan, Vikas Publishing House, 3rd Edition, 2010.
4. A Textbook on Engineering Drawing, [P. Kannaiah](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22P.+Kannaiah%22), [K. L. Narayana](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22K.+L.+Narayana%22), [K. Venkata Reddy](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22K.+Venkata+Reddy%22), Radiant Publishing House, 2012.
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| Contribution of Course Outcomes towards achievement of Program Outcomes (3-High, 2-Medium, 1-Low) |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 2 | - | - | - | 3- | 2 | - | - | 3 | 2 | - | - |
| CO2 | 3 | 3 | 2 | - | - | - | 2 | 2 | - | - | 3 | 2 | - | - |
| CO3 | 3 | 3 | 3 |  - |  - |  - | 2 | 2 |  - |  - | 3 |  2 |  - |  - |
| CO4 | 3 | 3 | 2 | - | - | - | 2 | 2 | - | - | 3 | 2 | - | - |
| CO5 | 3 | 3 | 2 | - | - | - | 2 | 2 | - | - | 3 | 2 | - | - |
| CO6 | 3 | 3 | 2 | - | - | - | 2 | 2 | - | - | 3 | 2 | - | - |