**23A03101T-ENGINEERING GRAPHICS**

# (Common to All branches of Engineering)

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| **Course Category:** | Engineering Science | **Credits:** | 3 |
| **Course Type:** | Practical | **Lecture-Tutorial-Practical:** | 1-0-4 |
| **Pre-requisite:** | Geometry | **Sessional Evaluation:****External Exam Evaluation:****Total Marks:** | 3070100 |
| **Course Objectives** | The students completing the course are expected to: |
| * + Understand the basic principles and conventions of engineering drawing, use engineering instruments and draw engineeringcurves.
	+ Use orthographic projections and make the students draw the projections of lines and planes inclined to both theplanes.
	+ Draw the projections of the solids in different positions with respect to the reference planes.
	+ Understand the importance of sectioning and concept of development ofsurfaces.
	+ Represent and convert isometric views to orthographic views and viceversa.
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| **Course Outcomes** | On completion of the course, the student should be able to: |
| **CO1** | Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections. |
| **CO2** | Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. |
| **CO3** | Understand and draw projection of solids in various positions in first quadrant. |
| **CO4** | Explain principles behind development of surfaces. |
| **CO5** | Prepare isometric and perspective sections of simple solids.  |
| **Course Content** | UNIT I Introduction: Lines, Lettering and Dimensioning, Geometrical Constructions and Constructing regular polygons by general methods.Curves: construction of ellipse, parabola and hyperbola by general, Cycloids, Involutes, Normal and tangent to Curves.**Scales:** Plain scales, diagonal scales and vernier scales.UNIT II**Orthographic Projections**: Reference plane, importance of reference lines or Plane, Projections of a point situated in any one of the four quadrants.**Projections of Straight Lines:** Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane, inclined to one reference plane and parallel to the other reference plane. Projections of Straight Line Inclined to both the reference planes.**Projections of Planes:** regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.UNIT III**Projections of Solids:** Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane and Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to other and axes inclined to both the reference planes.UNIT IV**Sections of Solids:** Perpendicular and inclined section planes, Sectional views and True shape of section, Sections of solids in simple position only.**DevelopmentofSurfaces:**MethodsofDevelopment:Parallellinedevelopmentandradialline development. Development of a cube, prism, cylinder, pyramidandcone.UNIT VConversion of Views: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.**Computer graphics**: Creating 2D&3D drawings of objects including PCB and Transformations using Auto CAD (Not for endexamination). |

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| **Text Book** | 1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016. |
| **Reference Books:** | 1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill,2013.
2. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson EducationInc,2009.
3. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill,2017.
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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 | - | 3 | 2 | - | - | - | - | - | 2 | 3 | 2 |
| CO3 | 3 | 3 | 2 | - | 3 | 2 | - | - | - | - | - | - | 3 | 2 |
| CO4 | 3 | 3 | 2 | - | 2 | 2 | - | - | - | - | - | 1 | 3 | 2 |
| CO5 | 3 | 3 | 2 | - | 2 | 2 | - | - | - | - | 1 | 1 | 3 | 2 |