

| Course Document | | Academic Year:2016-17 | |
|---|-----------------|-----------------------|---------------|
| Department of Mechanical Engineering | | | |
| Course Title : Computer Aided Machine Drawing | | | Credits: 04 |
| Course Code : 15ME36A/46A | | | L:T:P -3-0-3 |
| Course Type: PC | Semester : 03 | Div: A | CIE marks: 50 |
| Hours/week: 03 | Total Hours: 78 | | SEE marks: 50 |

Pre-requisites: Engineering graphics

Course Objectives:

1. Introduce Bureau of Indian Standards on drawing practices and standard components.
2. Impart knowledge of machine component and its conversion into 2D drawing.
3. Familiarize various thread forms and representation of standard thread components.
4. Make aware of structural riveted joints and couplings along with their standard empirical relations.
5. Model parts and create assembly using standard CAD packages like Solid edge/Solid works.
6. Familiarize with 2-D and 3-D modeling with cut section.

Course Outcomes(COs) : At the end of the course, the student will be able to

[Outcomes usually follow the format: "At the end of the course, students will be able to *insert verb here + insert knowledge, skills, or attitudes the student is expected to develop*]

| CO No. | Course Outcomes (<i>Action verb should be in italics</i>) | Bloom's taxonomy | Bloom's Level |
|--------|---|-------------------------|---------------|
| CO-1 | <i>Visualize and formulate</i> detail drawing of a given object | Visualize and Formulate | L 6 |
| CO-2 | <i>Read and interpret</i> a given production drawing. | Read and Interpret | L3 |
| CO-3 | <i>Identify</i> standard parts / components. | Identify | L2 |
| CO-4 | <i>Sketch</i> details and assembly of mechanical systems. | Sketch | L3 |
| CO-5 | <i>Create</i> 2-D and 3-D models by standard CAD software with manufacturing considerations | Create | L6 |

Title of the Chapter : Sections of Solids:

Unit No. : 1

Duration: 6 Hrs.

Outcomes of this chapter:

At the end of the Chapter, the student will be able to

| S.No. | Outcomes | Bloom's Level |
|-------|--|---------------|
| 1 | Explain the meaning of section plane and sectional views | L2 |
| 2 | Identify partial, broken section, revolved section, removed section in a drawing | L2 |

| | | |
|---|--|----|
| 3 | Employ the principles of graphic and obtain the sectional views for a given machine components | L3 |
| 4 | Identify the true shape of section taken on solid components | L2 |

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| Title of the Chapter : Orthographic views | Unit No. : 2 |
| | Duration: 9 Hrs. |

Outcomes of this chapter:

At the end of the Chapter, the student will be able to

| S.No. | Outcomes | Bloom's Level |
|-------|--|---------------|
| 1 | Employ the principles of engineering graphics or orthographic projection of machine parts with or without sections | L3 |
| 2 | Explain BIS standard conventions used in the drawing .Ex: Hidden line convention, Precedence of lines, Hatching patterns etc | L2 |

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| Title of the Chapter : Thread forms and Fasteners | Unit No. : 3 |
| | Duration: 8 Hrs. |

Outcomes of this chapter:

At the end of the Chapter, the student will be able to

| S.No. | Outcomes | Bloom's Level |
|-------|--|---------------|
| 1 | Explain the terminology of screw thread | L2 |
| 2 | Describe basic profiles and forms of screw threads | L2 |
| 3 | Explain standard forms of threads with empirical relations | L2 |
| 4 | Demonstrate the conventional representation of threads | L3 |
| 5 | Illustrate a procedure to draw hexagonal headed bolt and nut in different positions | L3 |
| 6 | Design and draw different type of fasteners using empirical relation showing different views | L6 |

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| Title of the Chapter : Riveted joints | Unit No. : 4 |
| | Duration: 6 Hrs. |

Outcomes of this chapter:

At the end of the Chapter, the student will be able to

| S.No. | Outcomes | Bloom's Level |
|-------|--|---------------|
| 1 | Differentiate between bolt and rivet | L4 |
| 2 | Explain different forms and proportion of rivet heads by illustrating with a drawing using empirical relations | L2 |
| 3 | Design and draw single and double riveted lap joints with chain and zig-zag riveting arrangement using snap head rivets | L6 |
| 4 | Design and draw single and double riveted butt joints with single or double cover straps having chain and zig-zag arrangement using snap head rivets | L6 |

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|---|---|-------------------------|
| Title of the Chapter : Coupling | | Unit No. : 5 |
| | | Duration: 4 Hrs. |
| Outcomes of this chapter: At the end of the Chapter, the student will be able to | | |
| S.No. | Outcomes | Bloom's Level |
| 1 | Design and draw the different views of various types of couplings showing sectional details in any one of the views | L6 |

| | | |
|---|---|--------------------------|
| Title of the Chapter : Assembly of machine components | | Unit No. : 6 |
| | | Duration: 42 Hrs. |
| Outcomes of this chapter: At the end of the Chapter, the student will be able to | | |
| S.No. | Outcomes | Bloom's Level |
| 1 | Develop the solid part models of machine parts and assemble them and draw the different views of the assembly showing the sectional details | L6 |
| 2 | Employ the graphic principles and use the software (Solid-edge) to model the individual components and assemble them to represent the final assembly by using the assembly interface software | L3 |
| 3 | Develop the different views of the assembly showing the details using PMI interface of the software | L6 |

Books:

1. N.D.Bhat & V.M.Panchal, 'Machine Drawing', Charotar Publications, 26thEdn. 1991.
2. K.R. Gopal Krishna, 'Machine Drawing', Subhash Publication. 17th Edn, 2003

Reference books:

1. S. Trymbaka Murthy 'A Text Book of Computer Aided Machine Drawing', CBS Publishers, New Delhi, 2007
2. N. Siddeshwar, P. Kanniah, V.V.S. Sastri, 'Machine Drawing', published by Tata McGraw Hill, 2006

Activities planned for achievement of outcomes:

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| Activities to be selected from following list (Partial list, more activities can be added by faculty) | Tick mark |
| 1. Assignments | √ |
| 2. Quizzes | √ |

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| 3. Internal Assessment Tests | √ |
| 4. Course Seminar | |
| 5. Course Project (Mini project) | √ |
| 6. Case Studies | |
| 7. Viva-Voce | |

Mapping of COs and POs

| Course Outcomes | Activities (Mention the S.No.) | Program Outcomes | | | | | | | | | | | |
|-----------------|-----------------------------------|------------------|---|---|---|---|---|---|---|---|----|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| CO-1 | | | | | | | | | | | | | |
| CO-2 | | | | | | | | | | | | | |
| CO-3 | | | | | | | | | | | | | |
| CO-4 | | | | | | | | | | | | | |
| CO-5 | | | | | | | | | | | | | |
| CO-6 | | | | | | | | | | | | | |
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Mapping of COs and PSOs

| Course Outcomes | Activities (Mention the S.No.) | Program Specific Outcomes | | | |
|-----------------|-----------------------------------|---------------------------|------|------|-----|
| | | PSO1 | PSO2 | PSO3 | ... |
| CO-1 | | | | | |
| CO-2 | | | | | |
| CO-3 | | | | | |
| CO-4 | | | | | |
| CO-5 | | | | | |
| CO-6 | | | | | |
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Note:

1. Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

It there is no correlation, put " - "

Name and signature of the faculty member