

**King Fahd University of Petroleum & Minerals**  
**MECHANICAL ENGINEERING DEPARTMENT**  
**ME 210: ME Drawing and Graphics**

**Catalogue Description:** (2-3-3)

Graphical interpretation of orthographic projection to include auxiliary views, section views, dimensioning, translation of design instructions into detail and assembly drawings, drawing conventions including weldments, piping, surface finish notation and selection of tolerances based on design requirements.

**Status in Curriculum (Required or Elective):** Required (offered Fall & Spring)

**Prerequisites:** None

**Co-requisites:** None

**Prerequisites by Topics:**

- None

**Textbook:** Frederick E. Giesecke, **Technical Drawing with Engineering Graphics**, 14th Edition, PEARSON, 2014.

**References:**

- 1) Students Manual, Solid Works notes, prepared by M. Younas and J.O'Brien, 2004.
- 2) Maurice Parker, Manual of British Standards in Engineering Drawing and Design, British Standards Institute, in association with Hutchinson.
- 3) Solidworks tutorials, from Solidworks Help.

**Coordinator:** Muhammad Younas, Yaqub Muhammad, Kamran Raza & Sarfaraz A. Furquan, Lecturer in Mechanical Engineering

**Goals: (general objectives)**

This course is intended to cover theory and practical techniques of engineering drawing. The course teaches the use of Solidworks as a CAD tool in making engineering drawings.

**Course Outline (Lecture Topics):**

1. Introduction to drawing for mechanical engineers, freehand sketching.
2. Introduction to computer-aided drawing software Solid Works.
3. Multi-view orthographic sketching. Basic Solid Works data entry.
4. Orthographic multi-view projection.
5. Construction of plane shapes using modify commands
6. Introduction to section drawing.
7. Further practice on CAD construction techniques
8. Introduction to dimensioning.
9. Addition of dimensions to drawings with CAD
10. Machine detail drawing
11. Detail drawing with the addition of machine and surface texture symbols
12. Simple assembly drawing.
13. Introduction to limits and tolerance
14. Assembly drawing with suitable fits and a parts list
15. Screw threads, fasteners and springs
16. Introduction to auxiliary views
17. Detail drawing to include auxiliary views
18. Common weld symbols used in drawings
19. Gears, gear drives and rolling bearings
20. Pipes/Structural drawing

**Design Activities/Projects:**

Cornerstone Design project including assembly of 3D parts and its 2D drawing is assigned.

**Computer Usage:**

Students use Solidworks software for making 2D and 3D drawings. Online quizzes are also conducted through the Blackboard.

**Laboratory:**

3 hours lab work every week.

**Assessment Tools:**

- i- Major Examinations
- ii- Classwork Assignments
- iii- Homework Assignments
- iv- Quizzes/Reading Exercises
- v- Cornerstone Design Project
- vi- Final Exam

**Course Learning Outcomes:**

- I- Students will demonstrate an understanding of first and third angle layout of orthographic drawing as used by mechanical engineers. [1, 2, 3, 4, 5]
- II- Students will practice construction of orthographic drawings from given pictorial views. [1, 2]
- III- Students will gain practice in reading completed engineering drawings and answer questions based on the information contained in these drawings. [3, 4, 5]
- IV- Students will practice freehand sketching with the aid of suitable grid paper. [1, 2, 4, 5]
- V- Students will gain knowledge and experience of an up to date version of Solid Works. [1, 2, 4, 5]

**Course Learning Outcomes mapped to Student Outcomes:**

Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course-to-Student outcome mapping	I, II, III		II, III		II, III, IV		I,II, III, IV			V	V
Emphasis*	L		M		L		S			M	S

\* L:: Little/None                      M: Moderate                      S: Strong

**Status of Continuous Improvement review of this Course:**

Date reviewed: -----  
Prepared by: Mr. Sarfaraz A. Furquan

Reviewed by: Drawing & Graphics Group  
Date prepared: January 26, 2015