CAD/CAM Computer Graphics and Machine Drawing (1+2)

Syllabus

First and third angle methods of projection. Preparation of working drawing from models and isometric views. Drawing of missing views. Different methods of dimensioning. Concept of sectioning. Revolved and oblique section. Sectional drawing of simple machine parts. Types of rivet heads and riveted joints. Processes for producing leak proof joints. Symbols for different types of welded joints. Nomenclature, thread profiles, multi-start threads, left and right hand thread. Square headed and hexagonal nuts and bolts. Conventional representation of threads. Different types of lock nuts, studs, machine screws, cap screws and wood screws. Foundation bolts. Design process, application of computers for design, definition of CAD, benefits of CAD, CAD system components. Computer hardware for CAD. Display, input and output devices. Graphic primitives, display file, frame buffer, display control, display processors, Line generation, graphics software. Points and lines, Polygons, filling of polygons. Text primitive. Other primitives. Windowing and clipping, view port. Homogeneous coordinates. Transformations. Planar and space curves design. Analytical and synthetic approaches. Parametric and implicit equations. B-spline and Beizer curves. Geometric modeling techniques. Wire frames. Introduction to solid modeling. Introduction to numerical control, basic components of NC system, NC coordinates and motion control systems. Computer numerical control, direct numerical control, combined CNC/DNC. NC machine tools and control units. Tooling for NC machines, part programming, punched tape, tape coding and format, manual and computer assisted part programming.

Planning of lectures		
S.No	Proposed No. of Lectures	Proposed No. of Lectures
1.	1st and 3rd angle methods of projection	1
2.	Preparation of working drawings from models and isometric views	1
3.	Drawing of missing views and different methods of dimensioning	1
4.	Concept of sections, revolved and oblique sections	1
5.	Sectional drawing of simple machine parts	1
6.	Types of rivet heads and riveted joints, process of producing leak proof joints	1
7.	Threads nomenclature, profiles, mull start, left and right hand and conventional representation of threads	1
8.	Nuts and bolts- square headed, hexagonal, types of lock nuts, studs, machine screws, cap screw and wood screw, foundation bolts	1
9.	Application of computers for design CAD, define, benefits, system components and computer hardware for CAD, display, input and output devices	1
10.	Graphic primitives, display file, frame buffer, display control, display processors, line generation, graphics software. Points and lines, polygons, filing of polygons, text primitive, windowing and clipping, view port	1
11.	Homogeneous coordinates, transformations, planners and space curves design	1
12.	Analytical and synthetic approaches, parametric and implicit equations	1
13.	B-spline and Biezer curves and Geometric modeling techniques, wire frames	1
14.	Introduction to solid modeling, introduction to numeric control, basic components of NC system, NC coordinate and motion control system	1

15.	Computer numerical control, direct numerical control, combined CNC /DNC	1
16.	NC machine tools and control units, tooling for NC machines, part programming, punched tape coding and format, Manual and computer assisted programming	1
	Total	**16**

Module-1 Orthographic Projection

1st and 3rd angle methods of projection
Preparation of working drawings from models and isometric views
Drawing of missing views and different methods of dimensioning
Concept of sections, revolved and oblique sections
Sectional drawing of simple machine parts

Module-2 Types of Joints

Types of rivet heads and riveted joints, process of producing leak proof joints
Threads nomenclature, profiles, mull start, left and right hand and conventional representation of threads
Nuts and bolts- square headed, hexagonal, types of lock nuts, studs, machine screws, cap screw and wood screw, foundation bolts

Module-3 Computer aided drawing

Application of computers for design CAD, define, benefits, system components and computer hardware for CAD, display, input and output devices
Graphic primitives, display file, frame buffer, display control, display processors, line generation, graphics software. Points and lines, polygons, filing of polygons, text primitive, windowing and clipping, view port
Homogeneous coordinates, transformations, planners and space curves design
Analytical and synthetic approaches, parametric and implicit equations
B-spline and Biezer curves and Geometric modeling techniques, wire frames

Module-4 Numeric Control systems

Introduction to solid modeling, introduction to numeric control, basic components of NC system, NC coordinate and motion control system
Computer numerical control, direct numerical control, combined CNC /DNC
NC machine tools and control units, tooling for NC machines, part programming, punched tape coding and format, Manual and computer assisted programming