DESIGN AND COMMUNICATION GRAPHICS SYLLABUS MAP

LINKS ↑ ↓ LINKS

SYLLABUS CONTENT	TIME → DEPTH						
Projection Systems	• Planes of Reference • Orthographic Proj. • 1st Auxiliary Views • True length & shape	• Proj of right solids • Solids in contact • Sectional views (1) • Pictorial Projection	• Oblique planes • Sectional views (2) • Intersection of solids	• 2nd Auxiliary views • Intersection of solids	• 3rd Angle Projection • Cube and tetrahedron • Solids in Contact	• Axonometric Projection- Isometric, diametric & trimetric	• Perspective projection-Vanishing points for inclined lines
Plane Geometry	• Construction of plane figures • Introduction to loci	• Loci as a problem solving tool • Tangents	• Loci as a problem solving tool	• Plane figures • Loci • Tangents	• Plane figures • Loci • Tangents	• Plane figures • Loci • Tangents	• Plane figures • Loci Tangents
Conic Sections	• Orthographic projections yielding conic sections	• Horizontal/vertical sections of cone & sphere	• Construct conic sections as plane loci – eccentricity, foci, etc	•Derive directrices, foci vertices and eccentricity from solid section	• Tangents – properties • Construct conics in a rectangle	• Construction of a double hyperbola given various criteria	Centre of curvature and evolute for conic sections
Descriptive Geometry of Lines and Planes	• Simply inclined planes • Angle of inclination – lines and planes	• Sections with vertical /horizontal/ simply inclined planes	• Oblique planes/traces • True inclinations - dihedral angle	• Lines of intersection • Dihedral angle between planes/surfaces	• Sectioning of solids by oblique planes	• Laminar surfaces defined by spatial co-ordinates	•Spatial relationship between Skew lines
Intersection & Development of Surfaces	•Develop/envelop surfaces of right solids and their fustra	• Intersection of lines and planes	• Intersection of lines/planes with planes/curved surfaces	• Surface intersection of prisms, pyramids, spheres, their fustra and composite solids	•Locating lines/curves of intersection using inclined/oblique planes/auxiliary views	• Intersection of right and oblique solids where their axes are parallel to 1 ref plane	• Develop/envelop the surfaces of oblique prisms, pyramids, cylinders and cones
Student Assignment (developing the skills)	• Capture images using a range of media	• Analyse design of everyday objects	• Communicate using rendered freehand sketches	• Generate CAD model of new/existing designs • Modify CAD files	•Produce exploded CAD models/pictorial views	•Photo realistic images of new/ modified artefact	• Reflect on the learning experiences
Graphics in Design & Communication	• Interpret/generate design briefs • Develop a plan	• Display rudiments of good design – compare/contrast	• Compare/contrast manual v electronic graphic communication	• Represent 3D objects in logically arranged 2D views	•Generate multi-view drawings from 3D models	•Use slides or animations to illustrate graphic solutions	• Evaluate design with reference to criteria
Communication of Design	• Use standards and conventions	•Create layouts to achieve pleasing presentation	• Use 2D and 3D drawings to communicate ideas	• Produce working drawings/assembly drawings	• Produce exploded CAD models/pictorial views	• Include balloon detailing & annotations	•Design schematic diagrams to explain familiar operations
Freehand Drawing	• Develop freehand sketching techniques •Observation techniques	• Produce sketches of basic solids	• Select the most suitable medium for producing sketches	• Use various methods of rendering & colouring	• Identify the surfaces of an object relative to one another in 3D	• Analyse the texture and colour of a surface	•Represent graphically the effects of light and shade
I.C.T.	• Create folder and save files • Import / export files	• Generate drawings from part and assembly models	• Realise the design intent in the CAD models – modify files	• Use CAD models to explore geometric principles	• Generate exploded views & animated sequences	• Transfer images from CAD to ICT packages –make presentation	• Collect/manipulate images to achieve special effects
Dynamic Mechanisms	• Involute of circle and regular polygons	• Helix and spirals - tangents	• Construction of loci defined by movement of circles	• Loci from linkage mechanisms	• Cam profiles and displacement diagrams	• Radial plate cams for in-line rollers and flat followers	• Gear profiles • Logarithmic spiral
Structural Form	• Historical context • Sketch key structural forms	• Produce 2D drawings of arches, domes, vaults etc..	• Hyperbolic paraboloid as a ruled surface • Sectional views	• Plane directors for ruled surfaces	• Hyperbolic paraboloid as a surface translation	•The hyperboloid of revolution, projections & sections	• Geodesic dome of not more than 4 points of frequency
Geologic Geometry	• Basic concepts • Interpolation and plotting of contours	•Finding profiles using vertical sections	• Cutting and embankments for level surfaces	• True dip, strike and thickness of strata • Outcrop of strata	• Cutting and embankments for sloping surfaces	• Determine the apparent dip of strata	• Solving mining problems with skew boreholes
Surface Geometry	• Surface developments of containers, roof surfaces and sheet metal fabrications.	•Determine lines and points of intersection between two intersecting surfaces	• Determine dihedral angle between adjacent plane surfaces forming solid objects	• Develop intersecting ductwork involving prismatic and right cylindrical surfaces	•Development of transition pieces of circular/circular & rectilinear/rectilinear	• Develop intersecting ductwork involving prismatic and oblique cylindrical surfaces	•Development of transition pieces of circular/rectilinear cross section
Assemblies	• Orthographic of standard components	• Sections of standard components • Layout & conventions	• Single plane section view of an assembly • Hatching	• Generate CAD model • Fully dimensioned drawings	• Multipart assemblies & section views • Exploded CAD model	• Balloon detailing • Indication of surface finish	• Indicate methods of assembly