

IV SEMESTER

CS 1412 COMPUTER GRAPHICS (2-1-0)

Use of Basic, C and FORTRAN in Computer Graphics Screen, World and Normalised Coordinates
Generation of Points, Line and two dimensional geometric figures
Scaling, rotation and translations and their representation in ti-om of matrix operations
Clipping, windowing and shading
Introduction to Graphic packages in Basic, C FORTRAN

CS1413 COMPUTER GRAPHICS LAB (0-0-3)

-P

Introduction to DOS system, Different graphics Modes and Graphics Drivers available Development of Computer programs to

- High light pixel
- Produce a line, triangle, square and other polygons
- Shading patterns and styles, filling the given poygon with the given colour
- Text generation in Graphics and its orientation
- Preparation of plan and elevation of simple building and detailing of building components

References

1. Newman and Sproull "Principals of Interactive Computer Graphics " Tata Mc Graw - Hill
2. karnighan and Ritchie" C Programming language" PHI
3. Hearn and Baker "Computer Graphics" PHI

CE 1401 ENGINEERING GEOLOGY (2-1-0)

I. Minerals

Their physical properties and detailed study of certain rock forming minerals

II. Rocks

Their origin, structure, texture and classification of igneous, sedimentary and metamorphic rocks and their suitability as Engineering materials, Building stones, Engineering properties of rocks

III. Stratification, lamination bedding, and dip strike of bed, overlap.

IV. Rock deformation

Folds, Faults, joints unconformity and their classification, causes and relation to engineering behaviour of rock masses.

V. Earthquake, its causes, classification, seismic zones of India and Geological consideration for construction of building.

VI. Landslides, its causes, classification and preventive measures.

VII. Underground water, Origin, Aquifer, Aquicludes, Artesian Wells, Underground provinces of India and its role as geological hazard.

VII. Geological investigations for site selection of Dams and Reservoirs tunnels, Bridges and highways

IX. Principles of Geophysical explorations, methods for subsurface structure.

CE 1408-P GEOLOGY LAB. (0-0-3)

LAB

1. Study of rock forming and Economic minerals, study of different rocks
2. Methods of completing the outcrop of rocks on a map
3. Drawing the geological sections of geological maps
4. Inter-relation of geological maps and sections with respect to subsurface Structure.
5. Problems of locating sites of projects like Dams, Tunnels, Highways et. In the geological sections

Suggested Text Books & References

1. Prabin Singh, „ Engineering and General Geology", Katson Publishing house.

2. Leggot, R. F. "Geology and Engineering", McGraw Hill, New York.
3. Blyth, F. G. M., "A Geology for Engineering", Arnold, London.
4. P. K. Mukerjee, "A Text Book of Geology" Clacutta, Word publisher.

CE 1402 FLUID MECHANICS II (3-1-0)

I. Laminar and Turbulent Flow

Equation of motion for laminar flow through pipes, Stoke's law, flow between parallel plates, flow through porous media, fluidisation" measurement of viscosity, transition from laminar to turbulent flow. turbulent flow, equation for turbulent flow, eddy viscosity. mixing length concept and velocity distribution in turbulent flow. Hot ~ .. wire anemometer and L D A.

II. Boundary Layer Analysis

Boundary layer thicknesses, boundary layer over a flat palte, laminar boundary layer, application of momentum equation, turbulent boundary layer, laminar sub-layer, smooth ad rough boundaries, atmospheric boundary layer, local and average friction coefficient, separation and its control, measurement of shear.

III. Pipe Flow

Nature of turbulent flow in pipes, equation for velocity distribution over smooth and rough surfaces. resistance coefficient and its variation, flow in sudden expansion, contraction, diffusers, bends, valves and siphons. concept of equivalent length. branched pipes. pipes in series and paralleL simple networks, pumps and turbines, transmission of power.

IV. Flow Past submerged Bodies

Drag and lift, drag on a sphere, cylinder and disc. lift, Magnus effect and circulation.

V. Compressibility Effects in Pipe Flow

Transmission of pressure waves in rigid and elastic pipes. water hammer, analysis of simple surge tank excluding friction.

CE 1406P FLUID MECHANICS II LAB. (0-0-3)

List of Experiments: -

1. To verify Darcy's law and to find out the coefficient of permeability of the given medium
2. To study the transition from laminar to turbulent flow and to determine the lower critical Reynolds number,
3. To study the velocity distribution in a pipe and also compute the discharge by integrating the velocity profile.
4. To study the variation of friction factor. "f" for turbulent flow in smooth and rough commercial pipes.
5. To determine the loss coefficients for the pipetlting.

6. To study the flow behaviour in a bend and to calibrate the pipe bend for discharge measurement.
7. To study the boundary layer velocity profile and to determine boundary layer thickness and displacement thickness. Also to determine the exponent in the power law of velocity distribution.
8. To measure the pressure distribution around a cylinder placed in a wind stress and to calculate the coefficient of drag.
9. To calibrate a venturi-meter and to study the variation of coefficient of discharge with the Reynolds number.

References

1. Grade, R.J., and A.G. Mirajgaoker, "engineering Fluid Mechanics (including Hydraulic Mechanics)", 2nd Ed., Nem Chand & Bros .. Roorkee, 1983.
2. Grade, R.J., "Fluid Mechanics through problems" wiley Eastern Limited. New Delhi 1989.
3. Streeter, V.L. and Wylie. E.B .. " Fluid Mechanics", McGraw Hill, New York. 8th Ed .. 1985.
4. Asawa, G.L.. "experimental Fluid Mechanics". Vol. I Nem Chand and Bros .. Roorkee, 1992.

CE 1403 STRUCTURAL ANALYSIS I (3-1-0)

- I. Classification of Structures, stress resultants, degrees of freedom per node Static and Kinematic Indeterminacy.
- II. Classification of Pin Jointed determinate trusses. Analysis of determinate plane and space trusses (compound and complex). Method of substitution and Method of tension coefficient
- III. Analysis of determinate beams & plane frames. bending moment, shear force diagrams and axial thrust diagrams. Elastic curve (sketch).
- IV. Rolling loads influence lines for beams and trusses. Absolute maximum ending moment.
- V. Analysis of Arches. Linear arch, Eddy's theorem, and three hinged parabolic arch, spandrel braced arch, moving load & influence lines.
- VI. Strain Energy of deformable systems, Maxwell's reciprocal & Betti's theorem, Castigliano's first theorem, unit load & Conjugate beam methods.
- VII. Unsymmetrical bending, location of neutral axis, computation of stresses and deflection .. shear center-its location for common structural section.
- VIII. Bending of curved bars in plane of bending, stresses in bars of small & large initial curvatures.

References

1. Wilbur and Norris, "elementary structural analysis", Tata McGraw Hill.
2. Reddy, C.S., "Basic Structural Analysis", Tata McGraw Hill.
3. Jain, A.P. and Jain, B.K., "Theory & Analysis of structures" Vol. I & II, Nem Chand.
4. Coates, R.C., Coutie, M.G. & King, F.K. .. "Structural Analysis", English language Book society & Nelson, 1980.
5. Ghali, A. & Neville, M., "structural Analysis", Chapman & hall Publications, 1974.
6. Jain, A.K., "Advanced Structural Analysis". Nem Chand & Bros. Roorkee, India, 1996.
7. Jain, O. P. & Arya A. S., "Theory of Structures", Vol. II, Nem Chand Bros., Roorkee, 1976.
8. Kinney, I. S., .. "Indeterminate Structural Analysis", McGraw Hill Book Company, 1957.
9. Wang, C. K., .. "Intermediate Structural Analysis", McGraw Hill Book Company, 1983.

CE 1404 SURVEYING II (3-1-0)

I. Plane Table Surveys

Principles, Advantages and disadvantages. Plane Table equipment Use of Telescopic Alidade and Indian Pattern Tangent Clinometer, Different methods of Plane Surveying, Resection - Two and three point problems, Fields works in Plane Table surveying and contouring.

II. Trilateration and Triangulation

Principle of Trilateration, EDM instrument and their uses, Reduction of observation, Principle and classification of Triangulation system, Triangulation chains, Strength of Figures. Station marks and Signals, satellite station, Intersected points, fields work. Reconnaissance, Intervisibility of station, Angular Measurement, Base Line measurement and extension, Adjustment of fields observation and Computation of Coordinates.

III. Adjustment Computations

Weighting of observations, Treatment of random errors. probability equation, Normal law of errors Most Probable Value & measures of precision, Propagation of errors and variances, Most probable value principle of Least square, Observations and correlative Normal Equations. Adjustment of triangulation figures and level nets.

IV. Curves

Classification of Curves; Elements of Circular, Transition and Vertical curves, Theory and methods of setting out Simple, Transition and Vertical curves, special fields problems.

V. Project surveys

General requirements and specifications for Engineering project surveys, Reconnaissance, Preliminary and Locations surveys for highways, railways and canals. Correlation of surface and underground surveys in case of culverts, Bridges and Tunnels: Principles and practice of hydrographic surveys, Layout of culverts, bridges and buildings.

CE 1407P SURVEY FIELD WORK (0-0-3)

List of Experiments

1. To carry out Triangulation and Trilateration of a given area (2-3 turns are needed).
2. To adjust the angular observations taken in exercise I.

3. To compute the adjusted coordinates of Triangulation stations.
4. To plot the coordinates at a given scale on Plane Table and their field checking.
5. To plot the details as well contours (topographic mapping) of area. using Radiation and Intersection methods (6-7 turns are needed).
6. To solve two Point and Three Point Problems in Plane Tabling.
7. Layout at simple circular curve on the ground using two Theodolite method.
8. Layout a building and a culvert on the ground.

References

Agor, R, "surveying". Vol. II & III . Khanna Publications, delhi, 1995.

1.Arora, K.R., " Surveying ", Vol. II & III. Standard Book House, delhi, 1993.

2.Bannister, A. and Baker, R., " solving problems in surveying," Longman Scientific Technical. U.K. 1990.

3.Kennie, T.J.M. and Petrie, G.. " Engineering Survying Technology", Blackie & Sons Ltd, London.1990.

4.Punmia, B.C., 'Surveying ; , Vol. II & III. Laxmi Publications, New delhi. 1996.

CE 1405 BUILDING MATERIALS AND CONSTRUCTION (3-1-0)

I. Building Materials

Bricks, stone, lime. timber. plywood, glass, plastics, steel aluminium: classification, properties and selection criteria. Cement, aggregate, admixtures: types properties, selection criteria, and tests. Preparation and properties of concrete. concrete mix design.

Introduction to destructive and non- destructive tests. Metal:

Types, classification and strength. LS. specufucations.

II. Building Construction

Building vyelaws, modular co-ordination.

Loads on buildings. Types of foundations and selection criteria. Brick masonry, stone madonry, bonds. Types of walls, partition and cavity walls, dedign criteria. Prefabricated construction.

Treatment for water proofing.

Doors and windows: sizes and locations, materials.

Stair and staircases: types, materials, proportions.

Lifts and escalators. White washing, colour washing, painting, distempering.

Shuttering, Scaffolding and centering. Expansion and construction joints.

Sound and fire proof construction, I.S. Specifications.

References

1.Arora, S.P. & Bindra, S.P., "A text book of Building Construction"- Dhanpat Rai & S Delhi. 1977

2.Jha, J. & Sinha, S.K., "Building Construction", Khanna Publishers, Delhi, 1977.

3. Kulkarni, C.J., "A text book of Engineering Materials", Ahmedabad Book Depot, Ahmedabad 1968.

4.Kulkarni, C.J., "A text book of Engineering Construction", Ahmedabad Book Depot