

DIPLOMA SEM IV CE

IVth Sem													
			Periods			Evaluation Scheme							
S.No	Subject Code	Name of Subject	L	T	P	Assign ment	TA	Total	ESE	Subject Total	Credit	Hours	
1	5AD.251	Advance Surveying	3	0	0	20	10	30	70	100	3	3	
2	5AD.253	Geo Technical Engineering	3	0	0	20	10	30	70	100	3	3	
3	5AD.254	Transportation I	3	0	0	20	10	30	70	100	3	3	
4	5AD.255	Hydraulics	3	0	0	20	10	30	70	100	3	3	
5	5AD.256	Concrete Technology	3	0	0	20	10	30	70	100	3	3	
6	40D.401	Professional skills	2	0	0	20	10	30	70	100	2	2	
	40D.151	Life Skills II** (Lateral)											
PRACTICAL/DESIGN/DRAWING/SESSIONAL													
1	5ADP.251	Surveying Field Work II	0	0	2		30	30	20	50	1	2	
2	5ADP.253	Geo Technical Engineering LAB	0	0	2		30	30	20	50	1	2	
3	5ADP.254	Transportation I Lab	0	0	2		30	30	20	50	1	2	
4	5ADP.255	Hydraulics LAB	0	0	2		30	30	20	50	1	2	
	5ADP.256	Concrete Technology Lab	0	0	2		30	30	20	50	1	2	
										850	22	27	
		Note: - ** (Qualifying For Lateral Students only)											

Program: Diploma

Semester: Fourth

Course: Advance Surveying

Course Code: 5AD.251

L	T	P	C
3	0	0	3

Course Objective:

- Apply advanced surveying techniques in different fields of civil engineering
- Demonstrate the principles of the earth surface, its projections and different coordinates involved in map making
- Apply GPS in transportation engineering, structural engineering and land use planning
- Apply GPS in transportation engineering, structural engineering and land use planning

Unit-I

Plane Table Survey- Principles of plane table survey, Accessories required, Setting out of plane table, Leveling, Centering and, Orientation, Use of Telescopic Alidade, Methods of plane table surveying– Radiation, Intersection, and Traversing, Merits and Demerits of plane table Surveying, Situations where plane table survey is used.

Unit-II

Theodolite Survey- Components of Transit Theodolite, functions, Technical terms used, Temporary adjustments of Transit Theodolite, Swinging the telescope, Transiting, Changing the face, Measurement of Horizontal angles, method of Repetition, errors eliminated by method of repetition, Method of Reiteration, Measurement of Deflection angle, Measurement of Vertical angles, Measurement of magnetic bearing of a line by Theodolite, Prolonging a Straight line, Sources of errors in Theodolite Surveying, Permanent adjustment of transit Theodolite (only relationship of different axes of Theodolite, Traversing with Theodolite, Method of included angles, locating details, checks in closed traverse, Calculation of bearings from angles, Traverse Computation- Latitude, Departure, Consecutive Co-ordinates error of Closure, Distribution of an angular error, balancing the traverse by Bowditch rule and Transit Rule, Gale's traverse table. Simple problems on above topic

Tacheometric Survey- Principle of Tacheometry, Essential requirements of Tacheometer, Use of Theodolite as a Tacheometer With staff held in vertical and fixed hair method (No derivation), Determination of Tachometric Constants, Simple numerical problems on above topics

Unit-III

Curves-Types of Curve used in Road and Railway alignments. Notations of simple circular Curve, Designation of curve by radius and degree of curves, Method of Setting out curve by Offset from Long chord Method and Rankine's method of deflection angles, Simple Numerical problems on above topics

Unit-IV

Advanced Survey Equipment's- Construction and use one second Micro Optic Theodolite, Electronic Digital Theodolite, Features of Electronic theodolite, Principle of E.D.M, Components of E.D.M and their Functions, use of E.D.M, Construction and Use of Total station, Construction and Use of Digital Level, Construction and Use of G.P.S

Aerial Survey and remote sensing- Aerial Survey Introduction, definition, Aerial photograph, Remote Sensing, Introduction, Electromagnetic Energy, Remote sensing system Passive system, Active system, Applications Mineral, land use Land cover, Natural Hazards and Environmental engineering System

Suggested Reading

1. *Surveying and Levelling*, N.N Basak, TataMcGraw-Hill
2. *Surveying and Leveling Partland II*, T.P. Kanetkar & S.V. Kulkarni, Pune Vidhyarthi Griha Prakashan
3. *Surveying and Leveling Vol. I and II*, Dr. B.C. Punmia, Laxmi Publication
4. *Text book of Surveying*, S.K. Husain, M.S. Nagaraj, S. Chand and company
5. *Surveying and Leveling Vol. I and II*, S.K. Duggal, TMH

Program: Diploma

Semester: Fourth

Course: Survey Field Work-II

Course Code: 5ADP.251

L	T	P	C
0	0	2	1

Course Objective:

List of Experiments:-

1. Study of plane table surveying equipments and accessories.
2. Three point problem in plane table surveying
3. Determination of Tacheometric constants and determination of horizontal distance and R.L. of points using Tacheometer.
4. Determining a height of object by measuring vertical angle.
5. Study of Planimeter
6. Study of Box Sextant
7. To determine the distance between two inaccessible points by the help of a base length
8. Setting out of Curves by radial offset method
9. To Give Layout for given plan of a building.

Program: Diploma

Semester: Fourth

Course: Geo-Technical Engineering

Course Code: 5AD.253

L	T	P	C
3	0	0	3

Course Objective:

- Carry out soil classification
- Solve three phase system problems
- Estimate the stresses under any system of foundation loads
- Solve practical problems related to consolidation settlement and time rate of settlement

Unit-I

Introduction: Definition of soil, rock, introduction to soil mechanics and foundation engineering, soil Formation, soil structure, soil map of India

Soil properties: Basic definitions, phase diagram, water content, specific gravity, void ratio, porosity, unit weight, weight volume relationships, index properties of soil and their determination, classification of soils, degree of saturation, density index.

Unit-II

Permeability of Soil & Seepage Analysis: Definition of permeability, Darcy's law of permeability, coefficient of permeability, typical values of coefficient of permeability for different soil, factors affecting permeability, determination of coefficient of permeability by constant head and falling head permeability tests, simple problems to determine coefficient of permeability, Seepage through earthen structures, seepage velocity, seepage pressure, phreatic line, flow lines and equipotential lines, flow net, characteristics of flow net, application of flow net (no numerical problems)

Unit-III

Shear Strength of Soil: Shear failure of soil, field situation of shear failure, concept of shear strength of soil, components of shearing resistance of soil, cohesion, internal friction, Mohr-coulomb failure theory, Strength envelope, strength equation, purely cohesive and cohesion less soils, introduction to Laboratory determination of shear strength of soil—Direct shear test, Unconfined compression test & Vane shear test, plotting strength envelope, determining shear strength, shear parameters of soil.

Unit-IV

Bearing Capacity of Soils & Earth Pressure: Concept of bearing capacity, ultimate bearing capacity, safe bearing capacity and allowable bearing pressure, Terzaghi's analysis and assumptions made effect of water table on bearing capacity. Field methods for determination of bearing capacity—Plate load test and standard penetration test. Test procedures as Per IS: 1888&IS: 2131, typical values of bearing capacity from building code IS: 1904, Definition of earth pressure, active earth pressure and passive earth pressure, coefficient of earth pressure, Rankin's theory and assumptions made for non-cohesive soils, total earth pressure distribution diagram for non-cohesive soils having dry backfill, submerged backfill and surcharge for horizontal plane surface and examples based on it.

Compaction and Consolidation; Compaction tests: Standard and Modified Proctor; Factors affecting compaction; Field compaction methods and control; One-dimensional consolidation – spring analogy; Terzaghi's theory of one-dimensional Consolidation; Consolidation of undisturbed & remoulded soils; Laboratory consolidation Test – analysis and results; Coefficient of volume change, Coefficient of consolidation, Compression index, Degree of consolidation; Secondary consolidation.

Suggested Reading

1. *Geo-Technical Engineering, T.N.Ramamurthy and Sitharam, , S.Chand Publication*
2. *Soil Mechanics, B.C.Punmia, Laxmi Publication*
3. *Geo-Technical Engineering, A.K. Upadhayay, Nirali*

Program: Diploma

Semester: Fourth

Course: Geo-Technical Engineering Lab

Course Code: 5ADP.253

L	T	P	C
0	0	2	1

Course Objective:

List of experiments:

1. Determination of water content in a given soil sample by oven drying method
2. Determination of specific gravity of a given soil sample by Density Bottle Method
3. Determination of field density by core cutter method
4. Sieve analysis
5. Hydrometer analysis
6. Determination of liquid limit
7. Plastic limit test
8. Direct shear test

Program: Diploma

Semester: Fourth

Course: Transportation-I

Course Code: 5AD.254

L	T	P	C
3	0	0	3

Course Objective:

- Understand the relationship between the environment and transportation infrastructure
- And the importance the environment plays in project development of transportation Projects.
- Prepare well written design narratives documenting the various parameters and standards
- Used in the design process so another individual could review the work and understand what decisions and assumptions were used and why."
- Understand the mathematics behind the development of tables and charts for determining Highway design criteria.

Unit-I

Introduction and Highway Development in India:

Different modes of Transportation, Characteristics of Road Transport, Brief history and development of Road Construction, Jayakar Committee Recommendations, Road Classification, Long term Road Plans, Vision – 2021, NHDP, Rural Roads Development Plan

Highway Planning: Principles of highway Planning, Road development and financing, privatization of highways, highway alignment requirements, engineering survey for highway location.

Unit-II

Geometric Design of Highways: Road Cross-sectional Elements: Width of Carriageway, Formation Width, Right of Way, Camber, Shoulder, Kerb, Road Margins, Design Speed, Sight Distances, Design of Horizontal curves, Super elevation, Extra widening on Horizontal curves, Transition curves, Set back distance at curves, Gradient, Design of Vertical curves –Summit and Valley curves

Unit-III

Traffic Characteristics: Traffic Studies, Traffic Volume, Traffic Forecast, Traffic Capacity, Traffic Control Devices, Parking Studies, Accident Studies, Highway Safety, Intersections-At grade and Grade Separated Intersections, Traffic Control Devices, Traffic Signs, Traffic Signal Systems, Traffic Islands, Road Markings, Highway Lighting, Intelligent, Transportation Systems

Unit-IV

Highway Materials and Construction

Subgrade Soil, Aggregates, Bitumen, Tar, Emulsion, Modified Bitumen, Cement Concrete, Tests on Aggregates, Tests on Bitumen, Bituminous Mix Design, Construction of WBM roads, Soil Stabilized Roads, Different types of Bituminous Constructions, Construction of cement Concrete Pavements, Equipments used in Highway Construction

Pavement Design: Types of Pavements, Flexible and Rigid, Pavement composition, Unconventional Pavements, Flexible Pavement Design as per IRC, Stresses in Concrete Pavements, Modulus of subgrade reaction, Design of rigid pavements as per IRC, Highway Drainage

Suggested Reading

1. *Highway Engineering*, Khanna&Justo, Khanna Publication
2. *Transportation Engineering*, N.L.Arora, S.P. Luthara, I.P.H.NewDelhi
3. *Transportation Engineering*, Vazarani&Chandola, Khanna Publication
4. *Road, Railway, Bridges, Biridi&Ahuja*, S.B.H.NewDelhi
5. *Transportation Engineering*, Kamala, T.M.H.NewDelhi

Program: Diploma

Semester: Fourth

Course: Transportation-I Lab

Course Code: 5ADP.254

L	T	P	C
0	0	2	1

-
1. Flakiness index test
 2. Determination of binder content for asphalt mix
 3. Penetration test
 4. Ductility test
 5. Softening point test
 6. Flash & fire point test
 7. Dynamic cone penetrometer
 8. Los-Angeles abrasion test
 9. Specific gravity of bitumen

Program: Diploma

Semester: Fourth

Course: Hydraulics

Course Code: 5AD.255

L	T	P	C
3	0	0	3

Course Objective:

- Apply the working principles of Impulse and Reaction turbines
- Select the type of turbine required with reference to available head of water and discharge
- Determine the characteristics of centrifugal pump
- Apply the working principles of the Reciprocating pump

Unit-I

Viscous flow: Flow of viscous through Circular Plates, Two Parallel Plates, Kinetic energy correction and momentum correction factor, loss of head due to friction in viscous flow

Turbulent flow: Introduction, Reynolds experiment, friction loss in pipe flow, expression for loss of head due to friction and coefficient of friction in terms of shear stress, velocity distribution for Turbulent flow in pipes with avg. velocity Boundary layer flow: Introduction, laminar Turbulent

Sub layer, displacement thickness, momentum thickness, energy thickness turbulent boundary layer on a flat plate total drag, separation of boundary layer.

Unit-II

Flow through Pipes: Introduction, Loss of energy in pipes due to friction, friction loss/ Darcy-Weisbach Equation and Chezy's formula, different minor energy (head) losses, Hydraulic gradient and total energy line, power transmission through pipe, siphon action of pipe, water hammer in pipe, pipe networks.

Unit-III

Hydraulic Machines: Reciprocating pumps; Centrifugal pumps; Impulse turbines; Pelton wheel, Francis Turbine Reaction turbines; Sketching and description of principles of working of above mentioned machines.

Unit-IV

Flow through open channels: Classification of low, uniform flow, Prismatic and non-prismatic channel, hydraulically efficient channel cross-sections, specific energy, specific energy curves, critical flow in rectangular channels.

Energy and Momentum Principle: Critical depth Concepts of specific energy, and specific force, application of specific energy, principle for interpretation of open channel flow phenomena, flow through vertical and horizontal contractions and concepts of Hydraulic jump, surges and water waves.

Suggested Reading

1. *Dr. P.N. Modi&Dr.S.M.Seth, Hydraulics &Fluids Mechanics, Standard BookHouse,Dehli*
2. *S.Ramamrutham, Hydraulics &Fluids Mechanics, Dhanpat Rai&Sons,Delhi*
3. *R.S.Khurmi,ATextBook of Fluids Mechanics &Hydraulics Machines, S.Chand &Company Ltd. New Delhi*
4. *A Text Book of Fluids Mechanics &Hydraulics Machines,R.K.Rajput,S.Chand&Company Ltd. New*
5. *Fluids Mechanics Hydraulics,Dr.JagdishLal, Metropolitan BookCo.Private*

Program: Diploma

Semester: Fourth

Course: Hydraulics Lab

Course Code: 5ADP.255

L	T	P	C
0	0	2	1

List of experiments

1. Determination of Chezy's and Manning's constants
2. Determination of co-efficient of discharge for venturiflume /standing wave flume
3. Determination of pipe friction factor
4. Determination of minor losses
5. Study of hydraulic jump.
6. Impact of Jet.
7. Trial on turbine
8. Trial on centrifugal pump
9. Trial on reciprocating pump.

Program: Diploma
Semester: Fourth
Course: Concrete Technology
Course Code: 5AD.256

L	T	P	C
3	0	0	3

Course Objective:

- Understand the roles and responsibilities of a project manager
- Prepare schedule of activities in a construction project
- Understand safety practices in construction industry
- Identify the equipment used in construction

Unit-I

Introduction: Definition of concrete, brief introduction to properties of concrete, advantages of Concrete, uses of concrete in comparison to other building materials

Ingredients of Concrete: Cement The chemical ingredients causing changes in properties, situations of use and special, Precautions in the use of following types of cements: Ordinary Portland cement, rapid handling cement, low heat cement, high alumina cement, blast furnace slag cement, Quick setting, white and colored cements, Portland pozzolana cement; **Aggregates:**(i) Classification of aggregates according to source, size and shape(ii) Characteristics of aggregates: Particle size and shape, crushed and rounded Aggregates, surface texture, specific gravity of aggregate; Bulk density, water absorption, Surface moisture, bulking of sand, deleterious materials in the aggregate (iii) Grading of aggregates, coarse aggregate, fine aggregate; All in aggregate; Fineness modulus; Interpretation grading charts and combination of two aggregates **Water:** Lime on the impurities as per IS, Effect of excessive impurities on concrete, ascertaining, the suitability of water with help of concrete cube test

Unit-II

Properties of Concrete: Properties in plastic stage, workability, segregation, bleeding
 Properties of hardened concrete: strength, durability, impermeability, dimensional
 Changes

Water Cement Ratio: Hydration of Cement, effect of water cement ratios on the physical structure of hydrated, Cement, water cement ratio law and the conditions under which the law is valid; Internal, Moisture, temperature, age and size of specimen, Definition of cube strength of concrete, relations between water cement ratio and Strength of concrete, Use of CRR charts and BIS codes.

Workability: Definition, phenomenon of workability, concept of internal friction, segregation and harshness; Factors affecting workability; Water content; Shape, size and percentage of Fineness passing

300 micron Measurement of workability; Slump test and compaction factor test; Recommended Slumps for placement in various conditions of placement

Unit-III

Proportioning For Ordinary Concrete: Object of mix design, strength required for various grades from IS 456, preliminary test, Cube test, proportioning for ordinary mixes prescribes by BIS and its interpretation, Adjustment on site for: Bulking water contents, absorption, workability, design data for moisture, bulk age, absorption and suitable fine aggregate and coarse aggregate ratio, Difference between ordinary and controlled concrete, Introduction to fines concrete

Form Work: Concept of factors affecting the design of form work (shuttering and staging)

Materials used for form work (including raw materials). Sketches of form work for column beam and slab. Precautions to be taken before during and after RCC construction Stripping time for form work as per BIS (no problem on the design of form work)

Unit-IV

Special Concretes:(i) New materials : Materials for light weight concrete Fly ash, Materials for high strength concrete, Accelerators and retarders, Air entraining and set controlling agents, Water reducing and set controlling agents, Special bonding agents like epoxy, Polymer concrete

(ii) Concreting under special conditions Cold weather concreting under water concreting, hot weather concreting, Special locations i.e. mass concreting, high strength concreting

Concrete Operations: Storing of cement, Storing of cement in warehouse, Storing of cement at site, Effect of storage on strength of cement.

Suggested Reading

1. *Concrete Technology*, M.L. Gambhir, TataMcGraw.HillPublishingCo.Ltd.NewDelhi
2. *Concrete technology*, A.M. Neville& JJ Brooks, Pearson EducationPyt.Ltd. NewDelhi
3. *Concrete technology*,M.S.Shetty, S.Chand Publication
4. *Text book of Concrete technology*,P.D.Kulkarni,M.H.GhoshandPhullpublication
5. *Chemical Admixtures for concrete*,H.R.Rixom,Powells, Books

Program: Diploma

Semester: Fourth

Course: Concrete Technology Lab

Course Code: 5ADP.256

L	T	P	C
0	0	2	1

List of Experiments:-

1. Fineness of cement
2. Normal consistency of cement
3. Initial and final setting times of cement
4. Specific gravity of cement
5. Soundness of cement
6. Bulking of sand
7. Workability tests on fresh concrete
8. Test for compressive strength of cement concrete

Program: Diploma

Semester: Fourth

Course: Professional Skills

Course Code: 40D.401

L	T	P	C
2	0	0	2

Course Objective: It is student-centric, value based, activity oriented professional education, where the Faculty is not only the disseminator of common wealth of knowledge and experience but the organizer of learning situations, facilitator of the learning process and co coordinator of learning following the age old adage of “I hear, I forget, I see, I remember, I do, I understand

- In this unit the students get opportunities to apply their classroom learning to practical situation.
- This course aims to develop the professional traits in them, so that they can meet the neo-challenges of job opportunities.
- Students become the architect of their career goals.
- Acquire leadership traits,
- Interpersonal skills,
- Adaptability, discussion skills, interview skills etc.

Unit-I

DISCUSSION SKILLS

Introduction
 Importance of Group Discussion Skills
 Process, Scope & Limits of Group Discussion
 Group Discussion, Interaction Strategies, Individual Contribution
 Leadership Skills, Team Management, Creating Friendly Co-operative Atmosphere
 Selection Group Discussion, Interactive Oral Process, Purposeful & Goal Oriented
 Characteristics, Agreement on Group Goals, Agreement on Procedure, Effective
 Communication, Equitable Distribution of Time; Speaking & Listening Skills; Adaptability;
 Assertiveness; Command Over the Subject

Unit-II

NEGOTIATION SKILLS

Speaking & Listening Skills
 Rapport Building
 Decision Making Ability
 Problem Solving Skill
 Attitudes
 Adaptability
 Conflict Handling Ability

Unit-III

JOB SEARCH & CORRESPONDENCE SKILLS

Introduction; Job Search Strategies
 Developing Job Communication Skills

Skill Analysis
Job Communication Process
Creating Network,
Prelude; Biodata, Curricula Vitae (CV) Resume
Determining the Need of the Employer

Unit-IV

INTERVIEW SKILLS

Interview; Introduction
The Interview Process
Types of Interview; Face to Face, Group Interview, Through Video Conferencing, Telephonic, Skype, Panel Interview
Planning/Purpose
Pre-Interview Techniques
Answering Strategies
Follow up

Suggested Books & Readings:

- *Monippally, Matthukutty. M. 2001. Business Communication Strategies. 11th Reprint. Tata McGraw-Hill. New Delhi*
- *Swets, Paul. W. 1983. The Art of Talking So That People Will Listen: Getting Through to Family, Friends and Business Associates. Prentice Hall Press. New York*
- *Lewis, Norman. 1991. Word Power Made Easy. Pocket Books*
- *Sen , Leena .Communication Skills ; Eastern Economy Edition*
- *Ghanekar , Dr. Anjali . Essentials of Business Communication Skills ; Everest Publishing House*
- *David Green . Contemporary English Grammar, Structure & Composition ; MacMillan*
- *Dictionary; Oxford*
- *Dictionary ; Longman*

Websites

- www.tatamcgrawhill.com/digital_solutions/monippally
- www.dictionary.cambridge.org
- www.wordsmith.org
- www.edufind.com
- www.english_the_easy_eay.com
- www.englishclub.com
- www.english_grammar_lessons.com
- www.wikipedia.org/wiki/english_grammar
-