VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.

B.E. Civil Engineering

Semester - IV

B.E./B.Tech II (Civil) :: 4th Semester		Teaching Scheme (Hours)			Examination Scheme					
					Theory			Practical/ Drawing		
Course	Course No.	L	T	P	Duration (hours)	Marks	Tuto. Mark.	Cont. Int. Eval. Marks	End Sem. Marks	Total Marks
Surveying - II	C401	3	-	4	3	100	-	40	60	200
Fluid Mechanics - II	C402C	3	-	2	3	100	-	20	30	150
Engg. geology & Bldg Materials	C403C	3	-	2	3	100	-	20	30	150
Geo Technical Engg.	AM404C	3	-	2	3	100	-	20	30	150
Structural Analysis - I	AM405C	3	-	2	3	100	-	20	30	150
Engg. Economics & Management	ASH/CE 406C	3	-	-	3	100	-	-	-	100

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CE 401C SURVEYING - II

(A) THEORY:

1. TACHEOMETRIC SURVEY:

Introduction, principles of tacheometry, different systems of tacheometry, reduction tacheometry, errors in tacheometry.

2. GEODETIC SURVEYING:

Principles, classification of triangulation systems, selection of stations, signals and towers, baseline measurement and correction, extension of base, base net, satellite station, reduction to center.

3. THEORY OF ERRORS:

Introduction, technical terms, law of accidental errors, laws of weights, most probable value of observed quantities, triangulation adjustment.

4. PHOTOGRAMMETRIC SURVEY:

Introduction, definition it terms, aerial photogrammetry, vertical photographs , flight planning, ground controls for aerial photogrammetry, photo maps and mosaics, stereoscopy.

5. ADVANCED TECHNIQUES OF SURVEYING:

Introduction to electronic distance measurement techniques, introduction to remote sensing, principles and applications of remote sensing.

6. OTHER METHODS OF SURVEYING:

Basic aspects of field astronomy, astronomical terms, coordinates systems, time relations.

(B) PRACTICALS / DRAWINGS :

Based on the theory course as prescribed above.

REFERENCES:

1. Dr. K. R. Arora, " Surveying and Levelling, Vol. I & II ", Standard Publications.
2. Kanitkar & Kulkarni, " Surveying and Levelling, Vol. I & II ", Vidyarthi Gruh Prakashan.
3. K. S. Duggal," Surveying and Levelling, Vol. I & II", TMH Edition.
4. Bansal, " Surveying and Levelling Practice", TMH Edition.

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CE 402C FLUID MECHANICS - II

(A) THEORY:

1. DIMENSIONAL ANALYSIS AND MODEL TESTING:

Dimensions, different systems, dimensional homogeneity, pie theorem, dimensional groupings, non-dimensional numbers and their physical significance, geometric kinematic and dynamic similarity, model laws, model testing and its analysis, scale effects.

2. BOUNDARY LAYER CONCEPTS:

Laminar and turbulent boundary layers, laminar sub layer, application of momentum equation, boundary equation, boundary layer on rough surfaces, method to avoid separation, wake concepts on drag and lift.

3. TURBULENT FLOW:

Types of turbulence, shear stress velocity distribution in pipes, eddy viscosity, pipe resistance factor, use of moody diagram.

4. FLOW THROUGH PIPES:

Concept of equivalent length, siphons, parallel and compound pipe lines, branching of pipe lines, pipe network, water hammer.

5. IMPACT OF JET:

Impact of Jet on flat curved, stationary and moving plates, velocity triangles at inlet and outlet.

6. WATER TURBINES:

Classification of Turbines, impulse and reaction turbine, efficiencies of turbines, velocity diagrams, draft tubes, cavitation.

(B) PRACTICALS :

1. Determination of Friction Factor for a given pipe system
2. Determining Force of jet due to impact on a flat plate
3. Study of Performance characteristics of pelton turbine
4. Study of Performance characteristics of kaplan turbine
5. Study of Performance characteristics of a francis turbine
6. Study on Formation of boundary layer on a flat plate
7. Determining Darcy’s friction factor ‘ f ’ for pipes of different diameters.
8. Use of Moody’s Diagram.

REFERENCES:

1. A. K. Jain, " Fluid Mechanics and Hydraulic Machines", Khanna Publishers, New Delhi.
2. Streeter V.L., " Fluid Mechanics ", McGraw Hill Book Company Ltd., New York.
3. Dr. Jagdishlal, " Fluid Mechanics ", Metropolitan Book Depot, Calcutta.

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CE 403C ENGINEERING GEOLOGY & BUILDING MATERIALS

(A) THEORY:

PART-I ENGG. GEOLOGY:

1. SCOPE OF GEOLOGY IN Civil Engg.:

Development of Engineering Geology, geological formation in India, geological processes.

2. MINERALS AND ROCKS:

Physical properties, types and identification.

3. DIFFERENT GEOLOGICAL STRUCTURES:

Folds, faults, joints, dip and strike relation, geological investigation approaches.

4. GEOLOGICAL CONSIDERATIONS:

Tunnels, dams, reservoirs, roads, buildings and bridges, earthquake zone and seismic hazards.

PART-II BUILDING MATERIALS:

1. Types of building stones and bricks, I.S. specification for bricks, bricks manufacturing process, tiles, stone ware pipes and terra cotta production.

2. Types of limes, and cements, and their usages, mortars and concrete, different type of mix proportions, and their uses.

3. Timber usages in buildings, main varieties of timber, main defects, preservation of timber, allied products, ply-wood, veneers, particle boards.

4. Miscellaneous building materials, iron and structural steel, aluminum, glass, plastics, asphalts, varnishes, distempers, paints and cement paints.

(B) PRACTICALS / DRAWINGS :

1. Study of map on horizontal bedding plane.
2. Study of map on inclined bedding plane.
3. Study of map on unconfirmity
4. Study of map on fold
5. Study of map on fault
6. Study of map on damsite
7. Study of rocks and minerals
8. Study of building materials.

REFERENCES:

1. Gupta R. B.," Text book of Engineering Geology ", Vidhyarthi Gruh Prakashan, Pune.
2. Arora D. S., " Geology for Engineers ", Mohindra Capital Publishers, Chandigarh.
3. Maclean A. C. & O. D. Gribble, " Geology for Civil Engineers ", George Allen & Onwin Publication.
4. Technical Teachers Training Institute, " Civil Engineering Materials ", Chandigarh.
5. Gosh D. N., " Materials of Construction ", Tata McGraw Hill Publication, New Delhi.
6. Rangwala S. C., " Engineering Materials ", Charotar Book Stall, Anand.

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AM 404C GEOTECHNICAL ENGG. - I

(A) THEORY:

1. ORIGIN AND EVOLUTION OF SOIL:

Earlier studies, need for soil engineering studies, soil as an engineering materials, scope of geo-technical engineering in civil engineering.

2. ELEMENTARY PROPERTIES AND THEIR MEASUREMENTS:

Constituent of soil, phase diagram, water density and unit weight, specific gravity, void ratio and porosity, degree of saturation, air voids and air content, zero air void curve, specific surface, inter-relationships of above properties, measurements of the above properties.

3. FORMATION AND CLASSIFICATION:

Formation, classification based on origin constituents, atomic structure, physiochemical phenomenon at inter-phase : Ion exchange thixotropy, classification based on a structure, need for engineering classification, field classification and related practice, grain size distribution and consistency limit, other systems of classification, measurements of grain size distribution and consistency limit.

4. COMPACTION:

Process definition, purpose, factors influencing compaction, field compaction, control of compaction in embankment, effect of compaction in engineering, properties, relative density, study of compaction test, quality control tests (C.C. and sand replacement, nuclear and proctor penetro-meter), Determination of relative density.

5. PERMEABILITY:

Purpose-Darcy's law and its range of validity, co-efficiency of permeability, seepage velocity, factors influencing permeability co-efficient, applicability to stratified deposits, concepts of effective stress, quick sand phenomenon, seepage pressure and piping, introduction of flow net, tests for determination of coefficient of permeability in field and laboratory.

6. COMPRESSIBILITY:

Compressibility, effective stress, compression of laterally confined soil, Terzaghi's theory of consolidation, time factor, state of consolidation of soil (Unconsolidated, pre-consolidated, normally consolidated), consolidation settlement, introduction to secondary consolidation.

7. ODEMETER TEST:

Test and its application in determining consolidation parameters, settlement computation and pre-compression load.

8. SHEARING RESISTANCE:

Purpose, coulomb's shear strength parameters, and stress - strain behaviour, mohr's coulomb's failure criteria, Terzaghi's effective shear parameter, factor influencing shear parameters, pore pressure meters, experimental techniques of total and effective shear parameters in lab. , in-situ shear test.

(B) PRACTICALS :

Based on the theory course as prescribed above.

REFERENCES:

1. Alam Singh, " Soil Engineering ", Agion Publishers, Jodhpur.
2. Purshottam Raj, " Geotechnical Engineering ", Tata McGraw Hill Publication.

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AM 405C STRUCTURAL ANALYSIS

(A) THEORY:

1. SPACE TRUSS:

Classification of 20 and 30 truss, analysis of simple ball-socket jointed, three dimensional statically determinate space truss by tension-coefficient method.

2. UNSYMMETRICAL BENDING:

Product moment of inertia, principal moment of inertia, principal axis of inertia, shear center, unsymmetrical bending of beams.

3. INFLUENCE LINES FOR BEAMS AND TRUSSES:

Definition and use of influence lines for support reaction, shear force and bending moment of statically determinate beams, influence lines for girders with floor system, properties of influence lines, computation of maximum moment and maximum shear for a series of concentrated loads and uniformly loads for beams, load positions and computation of max. values, maximum axial force for trusses, absolute maximum shear, bending moments and axial force.

4. DEFLECTION OF STATICALLY DETERMINATE BEAMS:

Slope and deflection of statically determinate beams under various loading condition by successive integration, conjugate beams method, castigliano's theorems, influence lines for deflection.

(B) TUTORIALS:

At least 15 problems based on the theory are required to solve and submit.

(C) PRACTICALS:

At least 3 experiments based on the theory are to be performed.

REFERENCES:

1. S. B. Junarkar & H. J. Shah, " Mechanics of structures ", Vol. II & III, Vivek Pub., Bombay.
2. B. C. Punamia, " Advanced Structural Analysis ", Laxmi Publication, New Delhi.
3. Ramamrutham, " Structural Analysis ",Dhanpat Rai Publication, New Delhi.

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ASH/CE 406 C ELEMENTS OF MANAGEMENT IN CIVIL ENGG.

(A) THEORY:

1. INTRODUCTION:

Introduction to Engineering Management, scope and domain of management, nature and objectives.

2. PRINCIPLES OF MANAGEMENT:

Basic principles, management levels, co-ordination, types and techniques of co-ordination, decision making - types and techniques.

3. ORGANISATION:

Types, structure , formal and informal organisation, decentralization, types of leadership.

4. ENGINEERING ECONOMICS:

Nature and scope, concepts of utility, demand and supply, elasticity of demand and supply, concept of cost and revenue.

5. FINANCIAL MANAGEMENT:

Sources of finances, financial institutions, financial accounting.

6. PERSONAL MANAGEMENT:

Concept, development and functions.

7. MOTIVATION:

Theories, types and techniques.

REFERENCES:

1. O.P. Khanna, " Industrial Engineering & Management ".
2. Devett & Verma, " Modern Economic Theory ".
3. L. M. Prasad, " Principles of Management ".
4. Mathur B. S. & Navin Mathur, " Principles of Management ", National Publishing House, New Delhi.
5. Terry G. R. & S. G. Franklin, " Principles of Management ", A. L. T. S. Publishes and Distributions.
6. Prasanna Chandra, " Financial Management ".
7. I. C. Dhingra, " The Indian Economy "