VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.

B.E. Civil Engineering

Semester - VII

B.E./B.Tech IV (Civil) :: 7th 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
Irrigation Engg -II	CE701C	3	-	1	3	100	-	10	15	125
Environmental Engg - II	CE702C	3	-	2	3	100	-	20	30	150
Transportation Engg - II	CE703C	3	-	2	3	100	-	20	30	150
Town Planning & Housing	CE704C	3	1	-	3	100	25	-	-	125
Structural Design & Drawing - III	AM705C	3	-	4	4	100	-	40	60	200
Computer Applications in Civil Engineering - II	CE/AM 706C	-	2	-	-	-	50	-	-	50
Seminar **	CE/AM 707C	-	-	2	-	-	-	20	30 +	50
Project Preliminaries **	CE/AM 708C	-	-	2	-	-	-	20	30 +	50

** Not to be considered as Passing Heads and Evaluation is by the department.

+ Assessment by the Department by panel of 2 examiners including supervising teacher.

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CE 701C IRRIGATION ENGINEERING - II

(A) THEORY :

1. RESERVOIR PLANNING:

Types of reservoirs, investigations for reservoir planning, site selection, storage zones, yield, mass inflow curve, determining capacity of reservoir, apportionment of total cost of a multipurpose reservoir.

2. SEDIMENTATION:

Sediment transport, determination of life of reservoir, control of sediment, reservoir losses, control of evaporation loss.

3. DAMS:

Types of dams, their advantages and disadvantages, selection of site for dam, site investigations.

4. GRAVITY DAM:

Design of gravity dam, principal and shear stresses, failure of dam and its stability, joints, galleries, shafts, foundation treatment.

5. EMBANKMENT DAMS:

Types of earth dam, causes of failure of earth dam, criteria of design of earthdam. seepage control through earth dam and its foundation.

6. SPILLWAYS AND ENERGY DISSIPATION:

Types of spillways, design aspects of Ogee spillway, spillway gates, jump-height curve and tailwater curves, different types of energy dissipators.

7. RIVER TRAINING AND FLOOD CONTROL:

Methods of river training, methods of flood control.

8. WATER POWER ENGINEERING:

Comparison of hydro-plant with traditional plants, some basic definitions of hydropower terms, types of low-head hydropower plants.

(B) PRACTICALS / ORAL / SKETCHING / DRAWINGS :

Based on the course prescribed above.

REFERENCES :

1. P.N. Modi (1995), Irrigation, Water resources and Water Power Engineering, Standard Book House, New Delhi.
2. G.L. Asawa (1996), Irrigation Engineering, New Age International Publisher, New Delhi.
3. S. K. Garg (1996), Irrigation Engineering and Hydraulic Structure, Khanna Publishers, New Delhi.
4. Deshmukh M.M. (1998), Water Power Engineering, Dhanpat Rai Publications, New Delhi.

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CE 702 C ENVIRONMENTAL ENGINEERING - II

(A) THEORY :

1. Introduction :

Environmental pollutions, such as land, water, air and noise pollution, their cause and effects on human health and environment, need for pollution control and methods of abatement, standards.

2. Waste water :

Important terms and definition, classification of waste waters, Physical, Chemical & Biological parameters and their significance, B.O.D /C.O.D requirements.

3. Collection and Conveyance :

Separate and combined sewerage systems for domestic waste-water and storm waters collections, components, appurtenances, layout and planning of sewerage systems, quantity of sewage & storm waters, design of sewers, maintenance of sewerage systems.

4. Waste-water Treatments :

Objectives of waste-water treatment, primary and secondary treatment systems, design of conventional treatments units like screen & grit chambers & PST, ASP, trickling filter, SST, stabilization ponds etc for domestic waste-water.

5. Sludge Handling :

Quantity and quality of sludge, sludge digestion methods, sludge drying beds and disposal of sludges.

6. Waste-water disposal :

Alternative disposal methods like disposal by dilution by irrigation, on land etc. Standards for disposal alternatives, natural purification of polluted streams.

7. Solid Waste Management:

Types and Sources, refuse collection and disposal techniques.

8. House drainage & Plumbing :

Terms & definition, general principles, pipes and pipe fittings various traps such as floor trap, nahni trap, gully trap, intercepting and greese traps, sanitary fittings system of plumbing and plans of plumbing & drainage system.

(B) Practicals/Oral/Sketching/Drawings :

Based on the course prescribed above.

REFERENCES :

1. Metcalf and Eddy, “Wastewater Engineering” : Treatment, Disposal Reuse” , Tata McGraw Hill Ed. New Delhi. (1995)

2. Birdie . G.S, “Water supply and sanitary Engineering “,Dhanpat Rai and Sons, New Delhi (1995).

3. Manual on Sewerage and Sewage Treatment, CPH and EE Organisation, Ministry of works and housing Govt. of India, New Delhi. (1991)

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CE 703 C TRANSPORTATION ENGINEERING – II

(A) THEORY :

1. Highway Planning and Administration :

History of road development, Road planning in India, Highway administration.

2. Highway Geometrics :

Alignment criteria and procedure, Types of highways,, Horizontal and vertical elements and design parameters, Problems of geometric design, cross sections of different roads.

3. Pavement Design :

Types of pavements, Sub grade soils and properties, Pavement materials, testing of binders, road aggregate mixes, Design of flexible and rigid pavements, IRC specifications, design problems.

4. Highway Construction:

Construction of low cost roads, WBM roads, types of bituminous surfaces, major equipments, Construction of penetration macadam, bituminous carpet, Bituminous concrete roads, Cement concrete roads.

5. Highway Maintenance:

Pavement evaluation, Surface and sub-surface drainage, Maintenance of bituminous and concrete roads, Concepts of overlays.

6. Traffic Engineering :

Basic parameters, Traffic studies, Different traffic control devices, Signs , markings, signals, Traffic management, One way system, grade separated system, highway capacity , level of service.

7. Highway Project:

Highway project preparation, surveys and investigations, project estimates, preparing project drawing and report.

8. Highways in Specific Areas:

Highways in hilly region, desert areas, waterlogged areas, issues and specific treatments.

9. Transportation Structures:

Types of bridges, site selection, hydraulic data, scouring loading standards, bridge components , construction techniques

(B) Practical/Tutorial/Drawing/Sketching :

(A) Test on subgrade soil and road aggregates

1. Determination of C.B.R. value of subgrade Base Course
2. Determination of Abrasion value
3. Determination of Impact value
4. Determination of Crushing value
5. Determination of Flakiness & Elongation Indices

(B) Tests on bituminous binder

6. Determination of softening point
7. Determination of penetration value

(C) Traffic studies

8. Mixed Traffic Volume Study
9. Speed studies of fast and slow vehicles.

REFERENCES :

1. Kadiyali L. R., " Principles and Practice of Highway Engineering", Khanna Technical Publications, Delhi.

2. Khanna S. K. and Justo, C. E. G, "Highway Engineering"

3. Different Indian Roads Congress Codes, Indian Road Congress pub., New Delhi.

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Semester - VII

CE 704 C TOWN PLANNING AND HOUSING

(A) THEORY :

1. Town Planning Evolution & Development :

Importance and scope of town planning,, Planning in Ancient, Medieval, Modern Periods, Noted urban planners, planning legislation and administration in India.

2. Urban Growth & Structure :

Urbanization, Trends, Growth phases, Urban form, Activity system, Landuse and density structure, Town structure, Town classification.

3. Planning Mechanism & Surveys:

Institutional framework , planning organisations, Civic surveys- types and significance

4. Urban Planning :

Plan formats, Basic principles, Conventional and system approach in planning, Community planning, Landuse planning, Neighbourhood planning, Preparation & implementation of development plan, aminities, norms, Growth regulations, T.P. Scheme, New towns, metrorigions.

5. Service Network:

Transport system, circulation network, standards, traffic problems, water supply and sanitary network, other network services.

6. City Center & Renewal:

CBD components, Town centres, Urban renewal programmes, Industries-types, Sites for Industries.

7. Industries:

Types, location, environmental consideration.

8. Housing :

Planning of residential area, Housing byelaws , Housing density, Building forms, Housing projects, neighbourhood housing.

(B) Practical/Tutorial/Drawing/Sketching :

1. Study of SUDA Bye-laws as applicable to housing societies.
2. Analysis of a housing society.
3. Designing a given housing society to meet the planning requirements and develop a landscape for the same.

REFERENCES :

1. Modak N.V. and V..N. Ambdekar., “Town and Country Planning and Housing”, Orient Longman Ltd. , New Delhi.

2. Hiraskar G.K. “ Fundamentals of Town Planning”, Dhanpat Rai & Sons, Delhi (1993).

3. Gallion A.B. and Simon Eisner, “ The Urban Pattern”, CBS Publisers, Delhi (1984).

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Semester - VII

AM 705C STRUCTURAL DESIGN & DRAWING – III

(A) THEORY :

1.Design of Columns for Uniaxial and Biaxial Bending

Axial load moment interaction, interaction diagram as design aid, interaction surfaces for a biaxially loaded column, codal procedure.

2. Design of Torsion

Torsional Stresses, strength of plain concrete beams and reinforced concrete beams in torsion, design of torsion with flexture & shear.

3. Connections between Various Structural Components

Serviceability failures, reasons for building failures, structural integrity reinforcement layout, construction details at connections.

4. Design of Combined & Strip Footing

Geometry of two column combined footings, design considerations, rectangular & trepezoidal combined footing, rib beam, strip footings.

5. Design of Retaining Walls

Types of retaining walls, forces and stability of retaining walls, behaviour and design considerations.

6. Design of Water Tanks

Introduction, joints in liquid retaining structures, tanks resting on grounds, circular tanks with flexible & restraint base, rectangular tanks, underground tanks, overhead tanks, elevated tanks.

7. Design of Prestressed Concrete Beams

Basic principles, methods of prestressing, assumption and advantages of prestressed concrete, design of section.

8. Multistorey Building Frames

Introduction, substitute frames, analysis for vertical loads and horizontal loads.

9. Introduction to Computer Aided Design

Introduction, computer aided design approved, design for structural elements, beams, slabs, columns and footings.

(B) PRACTICALS / TUTORIALS:

Design problems based on above topics will be given to students in tuto/pract. hours. The students will submit the design calculations and structural drawings.

REFERENCES:

1. Sinha S.N. “Reinforced Concrete Design”, Tata McGraw Hill, New Delhi, 1996.
2. Varghese P.C. Limit State “Design of Reinforced Concrete”, Prentice Hall (I), New Delhi, 1994.
3. Ramchandra “Limit State Design”, Standard Book House, New Delhi, 1990.

4. Syal I.C. & Ummat R.K. “Behaviour, Analysis & Design of Reinforced Concrete Elements”, A.H. Wheeler & Co., Allahabad, 1989.
5. Krishna Raju N. “Advanced Reinforced Concrete Design”, C.B.S. Pub. & Dist., New Delhi, 1988.
6. Holmes M. & Martin L.H. “Analysis & Design of Structural Connections : Reinforced Concrete & Steel”, Ellis Horwood, U.K., 1994.
7. McGregor J.G. “Reinforced Concrete : Mechanics & Design”, Prentice Hall, New Jersey, 1994.
8. Kenneth Leet, “Reinforced Concrete Design”, McGraw Hill, Singapore, 1991.
9. Moleley W.H. & Bungey J.H. “Reinforced Concrete Design”, McMillan, Hongkong, 1996.

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CE/AM 706 C COMPUTER APPLICATIONS IN CIVIL ENGG. – II

(A) THEORY :

PART - A

1. Auto CAD - Computer drafting, Mini CAD, LAND CADD software applications.
2. Surveying and roadway design series - Basics and application of surface modelling ,road alignment and earthwork calculations.
3. Introduction to Geographical Information System (GIS) softwares and other Civil engineering software.

PART - B

1. Introduction to numerical techniques for solving linear simultaneous equations.
2. Computer aided analysis programmes.
3. Computer aided design of structural elements.

Part “A” and Part “B” are handled by CED and AMD respectively.

REFERENCES:

1. Operation manuals for Auto CAD, Land CADD Series, Surveying and Roadway Design series.
2. B.M. Ayyub and R .H. McCuen “Numerical methods for engineers” Prentice Hall, 1996
3. W. H. Mosely and W.J. Spencer, “ Micro computer applications in structural engineering”, Mc Millan Publications.
4. Byron S. Gottfried, “Spreadsheet tool for engineers” (Excel 97 version), McGraw Hill International Ed., 1998.

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Semester - VII

CE/AM 707 C SEMINAR

SEMINAR

Each student shall prepare a paper on any one topic offered by CED/AMD and present it after approval of the seminar guide on the notified date. Scope for development of a model is kept and report of the same along with the model is to be presented at seminar schedule. Assessment is by the department.

CE/AM 708 C PROJECT PRELIMINARIES

PROJECT PRELIMINARIES

It is aimed to provide the preliminary background of understanding of the project to realise the problems in Civil Engineering. Student in a team have work for the project under guidence of a faculty member. The student has to opt one project offered by CED/AMD. Scope for referring the technical journals for case studies is provided. At the semester end, the project batch has to present a typed discussion paper to provide the clarity of objectives, data identification, methodology and review of literature for the assigned project.The assessment is at the department level by three examiners nominated.