

Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING & EXAMINATION

B.E. VI SEMESTER CIVIL ENGINEERING

S.No.	Board of Study	Subject Code	Subject	Periods per Week			Scheme of Examination			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Pract.				
							ESE	CT	TA		
1	Civil Engg.	320611 (20)	Structural Engineering Design - II	4	1		80	20	20	120	5
2	Civil Engg.	320612 (20)	Geotech Engineering - II	4	1		80	20	20	120	5
3	Civil Engg.	320613 (20)	Environmental Engineering - I	3	1		80	20	20	120	4
4	Civil Engg.	320614 (20)	Transportation Engineering - II	3	1		80	20	20	120	4
5	Civil Engg.	320615 (20)	Construction Planning and Management	2	1		80	20	20	120	3
6	Refer Table - I		Professional Elective - I	3	1		80	20	20	120	4
7	Civil Engg.	320621 (20)	Structural Engineering Lab	-	-	3	40	-	20	60	2
8	Civil Engg.	320622 (20)	Geotech Engineering - II lab	-	-	3	40	-	20	60	2
9	Civil Engg.	320623 (20)	Environmental Engineering- I lab	-	-	3	40	-	20	60	2
10	Civil Engg.	320624 (20)	Concrete Lab	-	-	3	40	-	20	60	2
11	Management	300625 (36)	Managerial Skills	-	-	2	-	-	40	40	1
12			Library	-	-	1	-	-	-	-	-
Total				19	6	15	640	120	240	1000	34

L- Lecture T- Tutorial ESE- End Semester Exam P- Practical ,
 CT- Class Test TA- Teacher's Assessment

Note :- Industrial Training of twelve weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part must have been completed in summer after IV sem. The second part to be completed during summer after VI sem. after which students have to submit a training report which will be evaluated by college teachers during B.E. VII sem.

Table - 1			
Professional Elective – I			
Materials Group			
S.No.	Board of Study	Subject Code	Subject
1.	Civil Engg.	320631 (20)	Modern Construction Materials
2.	Civil Engg.	320632 (20)	Composite Materials
3.	Civil Engg.	320633 (20)	Advanced Concrete Technology
4.	Civil Engg.	320634 (20)	Advanced Strength of Materials
Surveying Group			
5.	Civil Engg.	320635 (20)	Modern Surveying Techniques
6.	Civil Engg.	320636 (20)	Remote Sensing and its Applications
7.	Civil Engg.	320637 (20)	GIS and its Applications
Hydraulics Group			
8.	Civil Engg.	320638 (20)	Computational Hydraulics
9.	Civil Engg.	320639 (20)	Instrumentation in Fluid Mechanics
10.	Civil Engg.	320640 (20)	Water Power Engineering

Note (1) – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

Note (2) – Choice of elective course once made for an examination cannot be changed in future examinations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th

Subject: Structural Engineering Design-II

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: Civil Engineering

Code: 320611 (20)

Total Tutorial Periods: 12

Unit 1 Materials and Methods of Analysis

Properties of Structural Steel, I. S. Rolled Sections, I. S. Specifications, Elastic Analysis, Plastic Analysis for steel beams and frames - plastic hinges, Collapse mechanism, plastic modulus, shape factor.

Introduction to working stress method and Limit state method of design of steel structures, types of loads and load combinations.

Unit 2 Fasteners and Tension Members

Riveted, Bolted and Welded Connections, Strength, Efficiency and Design of Joints, Advantages and Disadvantages of Welded Joints, Design of Fillet and Butt Welds, Design of Eccentric Connections, Introduction to high strength friction grip bolts.

Net Sectional Area, Design of Axially Loaded Tension Member, Steel Angles under tension

Unit 3 Compression Members and Column Bases

Modes of Failure of a Column, Buckling Failure: Euler's Theory, Effective Length, Slenderness Ratio, Design Formula: I.S. Code Formula, Design of Compression Members, Design of Built-Up Compression Members: Laced and Battened Columns, Slab and Gusseted Bases.

Unit 4 Beams

Design Procedure, laterally supported and laterally unsupported beams, Built-Up Sections, Web Crippling, Web Buckling, Curtailment of Flange Plates

Unit 5 Member Subjected To Combined Forces

Design of Member Subjected to combined forces, Eccentricity of Load, Interaction Formulae. Eccentrically Loaded Base Plates.

Name of Text Books:

Design of Steel Structures – Arya, A.S., Ajmani, J.I. (Nem Chand & Bros., Roorkee, U.P.)

Design of Steel Structures – Punmia, Jain & Jain (Laxmi Publications)

Name of Reference Books:

I.S. code of practice on steel structures

Design of Steel Structures – Duggal S.K. (Tata McGraw Hill)

Design of Steel Structures (Vol. - I & II) – Ram Chandra (Standard Book House, New Delhi)

Design of Steel Structures – Dayaratnam (Wheeler Publishing, New Delhi)

Design of Steel Structures – E.H.Gaylord and C.N. Gaylord (McGraw Hill, New York)

Steel Structures: Design and Behaviour – C.G.Salmon and J.E.Johnson (Harper and Row, New York)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th

Subject: Geotech Engineering-II

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: Civil Engineering

Code: 320612 (20)

Total Tutorial Periods: 12

Unit 1 STABILITY OF SLOPES

Embankment slopes, examples of embankment, road and earth dams, stability analysis for finite and infinite slopes concept of factor of safety, friction circle method, method of slices, Bishop's simplified method, limiting values of factor of safety; critical conditions for the stability of earth dams.

Unit 2 Earth Pressure

Earth Pressure at rest, active and passive earth pressure, computations using Rankine's and Coloumb's earth pressure theories, Rabhann's and Culamaan's graphical method, additional earth pressure due to surcharge and earthquake loading.

Unit 3 SHALLOW FOUNDATIONS AND SETTLEMENTS

Common types of foundations with examples, brief illustration of situations where each one of them is adopted, basis for design, review of major soil parameters used in proportioning of shallow foundations, types and their selection bearing capacity, various method of determination of bearing capacity, computation of bearing capacity in cohesion less and cohesive soils, effect of various factors on bearing capacity, use of field test data, limits of settlement, differential and permissible settlement of footing, rafts on sand using penetration and load test data, estimation of settlement of footing for rigid and flexible, proportioning of footings.

Unit 4 WELL AND PILE FOUNDATIONS

Various types of caissons Situations where adopted, elements of wells, types, method of construction, tilt and shift, remedial measures, bearing capacity and settlement, Terzaghi's lateral stability analysis, Pile Foundation, their types, criteria of selection of piles, outline of steps involved in proportioning, bearing capacity and settlement of single and group of piles, design of pile groups and settlement of pile group in clay, negative skin friction.

Unit 5 MACHINE FOUNDATION, CONTAMINATED AND EXPANSIVE SOIL

Introduction of machine foundation, types of machines and their foundations, Design criteria, Field methods of determining design Parameters, block vibration test, response of block foundations under vertical vibrations, I.S. code recommendations and foundation on expansive soil, identification of expansive soil, contaminated soil, problems associated with contaminated and expansive soil, design consideration of foundation on expansive soil, CNS soils.

Name of Text Books:

Soil Mechanics and Foundation Engineering – B.C. Punmia (Laxmi Publication)

Soil Engineering in Theory and Practice (Vol-II) – Alam Singh (Asia Publishing House, New Delhi)

Name of Reference Books:

Basic and applied Soil Mechanics (Revised Edition) – Gopal Rajan and Rao A.S.R. (New Age, New Delhi. 1998)

Foundation Engineering (2nd Edition) – Peck,R.B., Hanson (W.E. and Thornburn. W.H. Johan Wiley, New York 1976)

Foundation design and Construction (5th Edition) – Tomlinson, M.J. (ELBS, Singapore. 1988)

Foundation Analysis and Designing – J.E. Bowles (McGraw Hill, New Delhi)

Soil Engineering in Theory and Practice (Vol. - II) – Alam Singh (Asia Publishing House, New Delhi, 1981)

Physical Methods of Soil Characterisation – J. Behari (Narosa Publishing Hall, New Delhi)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th

Subject: Environmental Engineering-I

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: Civil Engineering

Code: 320613 (20)

Total Tutorial Periods: 12

Unit 1 INTRODUCTION

Necessity and importance of water supply schemes.

Water demand

Classification of water demands, Estimation of quantity of water required by a town, per capita demand, factors affecting per capita demand, design period and population forecasting, variation in water demand.

Sources of water supply

Surface sources and underground sources, Intake works, site selection, type of intake works.

Unit 2 QUALITY OF WATER

Common impurities, physical, chemical and biological characteristics of water, water quality standards for municipal and domestic supplies.

Water Processing

Object of water processing, flow diagrams of typical ground water system and surface water systems.

Sedimentation

Theory of sedimentation, sedimentation tanks and its types, design parameters related with sedimentation tanks, sedimentation with coagulations, coagulants and coagulant aids, Jar test for determining coagulant dosage.

Unit 3 Filtration

Theory of filtration, slow sand and rapid sand filters, Construction and operation.

Disinfection

Methods of disinfection, Chlorination, Types of chlorination, Break Point chlorination.

Unit 4 Softening

Methods of Softening, Iron Removal, Fluoridisation.

Distribution System

Methods of distribution, layout of distribution system, methods of analysis, pressure in the distribution system, distribution reservoirs, functions and its types, storage capacity of distribution reservoir.

Unit 5 Air Pollution

Introduction, causes, sources, characteristics, effects of air pollution on plants, humans, animals and materials and atmosphere, air pollution control methods and equipment.

Noise Pollution

Definition, sources, effects of noise pollution on humans, animals and non-living things, methods of noise control.

Name of Text Books:

Water Supply Engineering – S.K. Garg (Khanna Publication).

Water Supply Engineering – B.C. Punmia (Laxmi Publication, New Delhi)

Name of Reference Books:

Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).

Water Supply and Sanitary Engineering – G.S. Birdi (Dhanpat Rai Publications).

Introduction to Environmental Science – Y. Anjaneyulu (B.S. Publications)

Environmental Science and Engineering – Henry and Heinke (Pearson Education)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th

Subject: Transportation Engineering-II

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: Civil Engineering

Code: 320614 (20)

Total Tutorial Periods: 12

Unit 1

Historical development of railway in India. Merits of rail transportation, gauges and gauge problems, railway track cross sections, coning of wheels, rail cross sections, weight of rail, length of rail, wear of rails, Creep of rails, rail joints and welding of rails, advantages of welding.

Unit 2

Sleepers

Requirements, various types, spacing and density, rail fixtures, fastenings.

Ballast

Requirements, various types.

Geometrics

Grading, cant and cant deficiency, transition curves, widening of gauges on curves.

Unit 3

Points and Crossings, design of turnouts, various types of track junctions, signaling and interlocking, classification of signals, control of movements of trains, interlocking of signal and points.

Unit 4

Tunnel Engineering

Consideration in tunneling shape and size, methods of tunnel, constructions, tunneling in soft soil and rocks, lining of tunnels, ventilations, drainage of tunnels.

Unit 5

Harbour Engineering

Harbour layout, harbour works, break water, jetties, wharves, piers and berthing facilities, navigational aids, port facilities, docks, transit sheds and ware houses, general layout of a port.

Name of Text Books:

Railway Engineering – S.C. Saxena & Arora (Dhanpat Rai Publications)

Tunneling Engineering – S.C. Saxena (Dhanpat Rai Publications)

Railway Engineering – Rangawala (Charotar Publications)

Name of Reference Books:

Harbour Engineering – Srinivas (-----)

Tunnel and Harbour – Seetharaman S. (Umesh Publications)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th

Subject: Construction Planning & Management

Total Theory Periods: 28

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: Civil Engineering

Code: 320615 (20)

Total Tutorial Periods: 12

Unit 1

Introduction

Objectives and functions of project management, project feasibility reports, Planning for construction projects, Cost control in construction-importance, objectives of cost control, cost control systems.

Economics of Project management

Economic analysis of engineering projects, economic studies, sensitivity analysis, Introduction to Management Information System (MIS)- definition, outline of MIS.

Unit 2

Scheduling

Scheduling Job layout and Line of balance, project management through networking PERT, CPM

Unit 3

Safety and Quality Control

Importance, causes of Accidents safety measures, responsibility for safety, safety benefits to various parties.

Quality control in construction: Importance, Elements of quality, Quality Assurance Techniques, Quality Control Circles.

Total Quality Management in construction, Introduction, Elements of TQM, Approaches to total quality, difference between traditional management and TQM, Applications and constants of TQM in construction process.

Unit 4

Economics of Project management

Economic analysis of engineering projects, economic studies, sensitivity analysis, Introduction to Management Information System (MIS)- definition, outline of MIS.

Unit 5

Construction Equipments and Management

Classification of construction equipments, earth moving equipments, hauling equipments, hoisting equipments, aggregate and concrete production equipments, pile driving equipments, time and motion studies, waiting line theory, Need for mechanisation, financing aspects, factors affecting selection of construction equipments, cost of owning and operating the construction equipment, role of operation research in equipment management, equipment maintenance.

Name of Text Books:

- Construction Engineering and Management – S. Seetharaman (Umesh Publications, New delhi, 1997)
- PERT & CPM – Punmia, B.C. and Khandelwal, K.K. (Laxmi Publications, New Delhi 1997)
- Construction Management and Planning – Sen Gupta & Guha (Tata McGraw Hill)

Name of Reference Books:

- Construction Planning Equipment and Methods – Peurify/ Schexnayder, 6th Edition (Tata McGraw Hill)
- PERT & CPM – Sreenath, I.S. (East West Press, New Delhi, 1975)
- Construction Management and Accounts – Vazirani, V.N. & Chandola, S.P. (Khanna Publishers, New Delhi, 2002)
- Construction Planning and Management – Gahlot & Dhir (New Age Publisher)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Modern Construction Materials
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320631 (20)
Total Tutorial Periods: 12

Unit 1

Concretes : High strength and High performance concrete-Fiber Reinforced concrete

Unit 2

Metals : New Alloy steels-Aluminium and its products-Other alloys

Unit 3

Composites : Plastics-Reinforced polymers-FRP-Celular cores

Unit 4

Other Materials : Water proofing compounds-Non -weathering Materials-Flooring and Facade Materials .

Unit 5

Smart and Intelligent Materials : Brief outline and uses

Name of Text Books:

Civil Engineering Materials (2nd Edititon) – Shan Somayaji (Prentice Hall Inc., 2001)

Materials for Civil and Construction Engineers – Mamlouk, M.S. and Zaniewski, J.P. (Prentice Hall Inc., 1999)

Name of Reference Books:

Materials for Civil and Highway Engineers (4th Edition) – Derucher, K.Korfiatis. G. and Ezeldin, S. (Prentice Hall Inc., 1999)

High Performance Concrete – Aitkens (McGraw Hill, 1999)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Composite Materials
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320632 (20)
Total Tutorial Periods: 12

Unit 1

Introduction, Historical background, Technological Applications, Composites – various reinforcement and matrix materials, Classification of composites.

Unit 2

Forms of fibre reinforcement, Comparisons of composites with R.C.C. and metals, Strength and stiffness properties, Effective moduli.

Unit 3

Fibre reinforced composite materials, Manufacturing Technique, Cost and Weight advantages.

Unit 4

Behaviour of uni-directional, cross-ply, angle-ply and other composites-strength and stiffness, anisotropy, Generalized Hooks law.

Laminates-Laminated Plates, Analysis, Strength and design with composites, Fibre reinforced Pressure vessels.

Unit 5

Laminates-Laminated Plates, Analysis, Strength and design with composites, Fibre reinforced Pressure vessels.

Name of Text Books:

Mechanics of Composite Materials – Robert M.Jones (Taylor & Francis, Philadelphia, 1998)

Fibre Reinforced Composites – P.K. Mallick (Marcel Dekker, Inc., New York, 1993)

Name of Reference Books:

Introduction to Design and Analysis with Advanced Composite Materials – Stephen R. Swanson (Prentice Hall, New Jersey, 1997)

Stress Analysis of Fiber-Reinforced Composite Materials – M.W. Hyer (WCB McGraw Hill, New York, 1998)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Advanced Concrete Technology
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320633 (20)
Total Tutorial Periods: 12

Unit 1

Concrete Making Materials

Aggregates classification, IS Specifications, Properties, Grading, Methods of combining aggregates, specified gradings, Testing of aggregates, Types of Fibers.

Cement, Grade of cement, Chemical composition, Testing of concrete, Hydration of cement, Structure of hydrated cement, Special cements

Unit 2

Properties of Concrete and Admixtures

Properties of fresh concrete, Hardened concrete, Strength, Elastic properties, Creep and shrinkage, Variability of concrete strength.

Water Chemical admixtures, Mineral admixture.

Unit 3

Concrete Mix Design

Principles of concrete mix design, Methods of concrete mix design, Testing of concrete.

Unit 4

Special Concrete

Light weight concrete, Fly ash concrete, Fibre reinforced concrete, Polymer Concrete, Super plasticised concrete, Epoxy resins and screeds for rehabilitation - Properties and Applications - High performance concrete.

Unit 5

Concreting Methods

Process of manufacturing of concrete, methods of transportation, placing and curing - Extreme weather concreting, special concreting methods, Vacuum dewatering - underwater concrete, special form work.

Name of Text Books:

Properties of Concrete – Neville, A.M., (Pitman Publishing Limited, London)

Concrete Technology – Shetty M.S., (S.Chand and Company Ltd. Delhi)

Name of Reference Books:

Light Weight Concrete Academic Kiado – Rudhani G. (Publishing Home of Hungarian Academy of Sciences, 1963)

Concrete Technology – M.L. Gambhir (Tata McGraw Hill)

Concrete Technology – R.S. Varshney (Oxford, IBH Publishers)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Advanced Strength of Materials
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320634 (20)
Total Tutorial Periods: 12

Unit 1

Stresses and Strains in three dimensions, Theories of failure.

Unit 2

Beams on elastic foundations, infinite, semi-infinite and finite beams.

Unit 3

Bending of curved beams in the plane of loading-crane hooks and chain links.

Unit 4

Bending of curved beam out of its initial plane, Saint Venant's equations and equations of equilibrium.

Bending of circular beams subjected to symmetric loading.

Unit 5

Torsion of non-circular members, St. Venant's theory, Torsional stresses in elliptical, triangular shafts.

Approximate solutions for rectangular section, Membrane analogy, Torsion of hollow sections, Torsional stresses in thin walled open and closed sections, Plastic, yielding of circular shafts.

Bending of thin plates, Assumptions of plate theory, GDE for deflection of plates, Boundary conditions.

Solutions for rectangular plates, Navier's and Levy's solutions, circular plates, Membrane theory of shells of revolution and cylindrical shells.

Name of Text Books:

Name of Reference Books:

Boresi, A.P. and Sidebottom, O.M., "Advanced Mechanics of Materials", John Willey and Sons, 1985.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Modern Surveying Techniques
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320635 (20)
Total Tutorial Periods: 12

Unit 1

Modern Surveying Equipment

E.D.M. Instruments – Geodimeter, Tellurometer, Distomat, Total Station, Applications of Lasers in distance and angular measurements, Introduction of Electronic navigation and Position Fixing – different systems and their Characteristics.

Unit 2

Global Positioning System

Global Positioning System – working principle and methods, Different Approaches to use GPS and their accuracies, Advantages of GPS in Navigation, Survey, Planning and Mapping.

Unit 3

Geographic Information System

Geographic Information System – data requirement and database creation; Use of field data, maps, aerial and satellite data; Advantages of GIS.

Unit 4

GIS Analysis

Types of GIS analysis, map topology, map feature elements, queries, features in a topographic base map, base map accuracy standards.

Unit 5

Surveying Mapping through Software

Introduction of ARC Info, ARC View, ARC Gms, Intergraph, MGE, Modular GIS Environment, Map Info and Geomedia web map, etc.

Name of Text Books:

Surveying (Vol - I, II & III) – Arora, K.R. (Standard Book House, Delhi, 1993)
Elements of Photogrammetry – Wolf, P.R. (McGraw Hill Book Company, New Delhi,)

Name of Reference Books:

Solving Problems in Surveying – Bannister, A. and Baker, R. (Longman Scientific Technical, U.K., 1994)
Electronic Distance Measurement – Burnside, C.D. (Oxford, BSP Professional Books, London, 1991)
Engineering Surveying Technology – Kennie, T.J.M. and Petrie, G. (Blackie & Sons Ltd., London, 1990)
Electronic Surveying in Practice – Laurilla, S.H. (John Wiley & Sons, New York, 1983)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Remote Sensing and its Applications
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320636 (20)
Total Tutorial Periods: 12

Unit 1

Remote Sensing

Introduction and definition of Remote Sensing terminology, Photogrammetry, Types of Photographs, Geometry of Photographs, Stereophotogrammetry.

Unit 2

Image Processing Systems

Principles of interpretation of aerial and satellite images, equipments and aids required for interpretation ground truth collection and verification, advantages of multiband and multiband images.

Unit 3

Initial Statistics Extraction

Digital Satellite data products and their characteristics, Histogram and its utility, Enhancement, Different methods of digital satellite data interpretation.

Unit 4

Radiometric and Geometric Correction in Image Processing

Introduction, radiometric correction of remotely sensed data, correction for sensor system, detector error, spatial interpolation using coordinate transformations, intensity interpolation.

Unit 5

Micro Wave Remote Sensing

Introduction, the radar principle, radar removal advantages, synthetic aperture radar (SAR), interpreting SAR images.

Name of Text Books:

Campbell, J.B., "Introduction to Remote Sensing", The Guilford Press, Lond, 1986.
Wolf, P.R., "Elements of Photogrammetry", McGraw Hill Book Company, New Delhi, 1986.

Name of Reference Books:

Curran, P.J., "Principles of Remote Sensing", Longman, London, 1985.
Engman, E.T. and Gurney, R.J., "Remote Sensing in Hydrology", (Chapman and Hall, London, 1991).

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: GIS and Its Applications
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320637 (20)
Total Tutorial Periods: 12

Unit 1

Basic Concept of GIS

Introduction, Information systems, spatial and non-spatial information, Geographical concepts and terminology, Advantages of GIS, Basic components of GIS, Commercially available GIS hardware and software, organisation of data in GIS.

Unit 2

GIS Data

Input data, Field data, Statistical data, Maps, Aerial photographs, Satellite data, Points, lines and areas features, Vector and Raster data, Advantages and Disadvantages, Data entry through keyboard, digitizers and scanners, Digital data, GIS data formats and standards.

Unit 3

Data Management

Data Management, Data Base Management System (DBMS), Various data Models, Run – length encoding, Quadtrees, Data Analysis – Data layers, analysis of spatial and non-spatial data, Data overlay and modelling, smart features of DBMS.

Unit 4

Applications of GIS

Applications of GIS in Map Revision, Landuse, Agriculture, Forestry, Archaeology, Municipal, Geology, Water Resources, Soil Erosion, Land suitability analysis, Change detection.

Unit 5

Case Study

A case study in GIS implementation, the consultant, the client, the initial applications, types of GIS analysis used for case study.

Name of Text Books:

Introduction to Remote Sensing – Campbell, J.B. (The Guilford Press, London, 1986)

Remote Sensing and Geographic Information Systems – Legg, C.A. (Ellis Horwood, London, 1992)

Name of Reference Books:

Principles of Geographic Information System for Land Resources Assessment – Burrough, P.A. (Monograph on Soil Resources Survey No. 12, Claredon, Press, Oxford, 1988)

Remote Sensing in Hydrology – Engaman, E.T. and Gurney, R.J. (Chapman and Hall, London, 1991)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Computational Hydraulics
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320638 (20)
Total Tutorial Periods: 12

Unit 1

Introduction, significance of computational hydraulics, discrete forms of the laws of conservation of mass, momentum and energy, examples of free surface flows.

Unit 2

Continuous forms of the conservation laws, lateral inflow's 1-D expansions and contractions, homogeneous and stratified fluid flows.

Unit 3

Method of characteristics – Characteristics and invariants, regions of state, computation of hydraulic jump, indeterminacy conditions, the linearised method of characteristics.

Unit 4

Difference forms of conservation laws, weak solutions applications, storm-sewer networks, diffusion problems, river morphology, linear wave propagation.

Unit 5

Numerical methods – Finite difference method with example 1-D horizontal flow.

Name of Text Books:

Computational Hydraulics – Brebbia, C.A. and Ferrante, A.J. (Butterworth & Company (Publishers) Ltd., London, 1983)

Applied Hydraulic Transients (2nd Edition) – Chaudhary, M.H. (Van Nostrand Reinhold Company Inc., New York, 1987)

Name of Reference Books:

Unsteady Flow in Open Channels (Vol. - I & II) – Mahmood, K. and Yeyjevich, V. (Water Resources Publications, Fort Collins, Colorado, U.S.A., 1975)

Computational Hydraulics – M.B. Abbott (Pitman Publication Company)

Engineering Applications of Computational Hydraulics – M.B. Abbott & J.A. Gunge (Pitman Books Ltd.)

Computational Hydraulics: An Introduction – Vreugdenhill, C.B., 1989 (Springer-Verlag, Berlin)

Computational Hydraulics – Abbot, M.B. & A.W. Minns, 1994 (Ashgate Publication)

Chhattisgarh Swami Vivekanand Technical University, Bilai

Semester: 6th
Subject: Instrumentation in Fluid Mechanics
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320639 (20)
Total Tutorial Periods: 12

Unit 1

Introduction

Need for instrumentation in various fluid flow processes, types of measurements: pressure, velocity, temperature, discharge, water levels, force, shear stress, basic principles of transducers, microprocessors and data-acquisition systems, calibration of instruments.

Unit 2

Pressure Measurements

Manometers, capacitance and inductance transducers, non-contact probes.

Unit 3

Velocity measurements

Pitot tube, Pitosphere and Pitocylinder, current meter, Hot wire anemometer, Laser-Doppler anemometer.

Unit 4

Discharge Measurement

Venturimeter, orifice meter, bend meter, electromagnetic and ultrasonic flow meters, rotameer, weirs and flumes, tracer techniques, Hot wire anemometer and thermistors.

Unit 5

Other Measurements

Water level recorders direct and indirect measurement of shear stress, force transducers, use of tracers in dispersion and diffusion studies.

Name of Text Books:

Instrumentation: Devices and Systems – Rangan C.S., Sharma G.R. and Mani V.S.S. (Tata McGraw Hill Publishing Company)

Name of Reference Books:

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Water Power Engineering
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320640 (20)
Total Tutorial Periods: 12

Unit 1

Introduction

Water Power, its development and use, relation of water power and hydrology.

Unit 2

Water Power Estimate

Collection and analysis of stream flow data, mass curve, flow duration curves, construction and utility of these curves, effect of storage and pondage, estimates of available water power.

Unit 3

Water Way

Intake, gates, valves, canals, surges and its effects, penstocks, classification, design, criteria, economical diameter, water hammer, surge tank.

Unit 4

Hydraulic Turbines

Classification of turbines, Francis, Kaplan and Pelton Turbines, Component parts and their function, Draft tubes and their theory, Similarity laws and specific speed unit, Quantities, performance curves, Governing of turbines, selection of turbines, cavitation in turbines.

Unit 5

Power House and Equipment

Location of power house, general arrangement of Hydroelectric unit, Number and size of units, Power house substructure, Pumped storage plant.

Name of Text Books:

Water Power Engineering – M.M. Dandekar, K.N. Sharma (Vikas Publishing House Pvt. Ltd.)
Water Power Engineering – Deshmukh (Dhanpat Rai & Sons)

Name of Reference Books:

Irrigation and Water Power Engineering – B.C. Punmia (Laxmi Publication)
Hydro Electric Engineering – Creager and Justin (Willay Institutional)
Hydro Electric Engineering Practice – Brown, J.G. (Blackie and Sons Ltd., London)
Irrigation and Water Power Engineering – Dr. P.N. Modi (Standard Book House)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Structural Engineering Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Civil Engineering
Practical Code: 320621 (20)

Experiments to be performed (Min 10 experiments)

1. Introduction to latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
2. Geometrical Modelling of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
3. Modelling of loads and load combinations on RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
4. Analysis and Interpretation of Results of Analysis of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
5. Design of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
6. Interpretation of Results of Design of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
7. Geometrical Modelling of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
8. Modelling of loads and load combinations on Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
9. Analysis and Interpretation of Results of Analysis of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
10. Design of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
11. Interpretation of Results of Design of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
12. Design of R.C.C. Column on latest version of a Standard Structural Engineering Design Package such as STAAD.etc
13. Design of R.C.C. Isolated Footing on latest version of a Standard Structural Engineering Design Package such as STAAD.etc
14. Case Study of design of a RCC Multistorey Building on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
15. Case Study of design of a Steel Industrial Building on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.

List of Equipments / Machine Required:

Latest Release of Software Package STAAD Pro (Research Engineers International, Kolkata)

Latest Release of Software Package STAAD.etc (Research Engineers International, Kolkata)

Recommended Books:

- (1) Reference Manual for Respective Software
- (2) Verification Manual of Respective Software

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th

Subject: Geotech Engineering -II Lab

Total Practical Periods: 40

Total Marks in End Semester Exam: 40

Branch: Civil Engineering

Practical Code: 320622 (20)

Experiments to be performed (Min 10 experiments)

1. Determination of water content dry density relation using light-compaction test.
2. Determination of water content dry density relation using heavy compaction test.
3. To determine California Bearing Ratio for the designing of pavements, laboratory determination of CBR test.
3. To determine in-situ bearing value of subgrade by North Dakota Cone Apparatus.
4. Direct Shear Test on the (1) Dry cohesionless / cohesive soil specimen remoulded / unremoulded (2) Direct shear test – undrained test, direct shear test-consolidated undrained.
5. Triaxial Compression Test (Triaxial compression test): (a) UU, (b) CU, (c) CC.
6. Determination of Unconfined Compression Strength of cohesive soils (Remoulded / Unremoulded)
7. Laboratory Vane Shear Test (Remoulded / Unremoulded)
8. Consolidated test (Remoulded / Unremoulded) Consolidated test (Fixed Ring / Floating Ring).
9. To determine swelling pressure of purely cohesive soil (Remoulded / Unremoulded specimen)
10. Determination of density index (relative density) of cohesionless soils.
11. Study of standard penetration.
12. Determination of bearing capacity of soil by plate load.

List of Equipments / Machine Required:

Light Compaction Mould
Heavy Compaction Mould
Oven
CBR Apparatus
North Dakota Cone Apparatus
Direct Shear Test Apparatus with full accessories
Triaxial Compression Test Apparatus with full accessories
Consolidometer Apparatus
Unconfined Compression Test Apparatus
Swell Pressure Test Apparatus
Standard Penetration Test Apparatus with full accessories
Plate Load Test Apparatus with full accessories
Soil Sampling Tube

Recommended Books:

Soil Mechanics and Foundation Engineering – B.C. Punmia (Laxmi Publication)
Soil Engineering in Theory and Practice (Vol-II) – Alam Singh (Asia Publishing House, New Delhi)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Environmental Engineering-I Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Civil Engineering
Practical Code: 320623 (20)

Experiments to be performed (Min 10 experiments)

1. To determine acidity of water sample.
2. To determine alkalinity of water sample.
3. To determine hardness of water sample.
4. To determine chloride content of water sample.
5. To determine D.O. content of water sample.
6. To estimate the quantity of BOD from water sample.
7. To determine the availability of chlorine in bleaching powder.
8. To determine the residual quantity of Cl₂ Content.
9. Determination of quantity of Optimum Coagulant Dose.
10. Determination of Break Point Chlorination.
11. Determination of Total Solids.
12. Determination of Turbidity.
13. Determination of particulates in air.
14. Determination of MPN.
15. Determination of pH of water.

List of Equipments / Machine Required:

BOD Incubator
Dust Sampler
Turbidity meter
Microscope
pH meter
Muffle Furnace
Hot Air Oven
Jar Test Apparatus

Name of Text Books:

Environmental Engineering Lab Manual – Dr. B. Kottaiah & N. Kumaraswamy (Charotar Publications)
Water Supply Engineering – S.K. Garg (Khanna Publication).
Water Supply Engineering – B.C. Punmia (Laxmi Publication, New Delhi)
Environmental Science and Engineering – Henry and Heinke (Pearson Education).

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 6th
Subject: Concrete Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Civil Engineering
Practical Code: 320624 (20)

Experiments to be performed (Min 10 experiments)

1. Determination of Strength of concrete
2. Determination of Workability by compaction factor
3. Determination of Slump test for a concrete mix
4. Determination of workability by Veebee test
5. Determination of workability by Flow table test
6. Determination of Modulus of elasticity of concrete and strain measurement by longitudinal compressometer
7. Determination of Soundness test on aggregate
8. Determination of Deleterious materials in fine aggregate
9. Determination of flexural strength of concrete
10. Mix Design by I.S. Code method (with OPC Cement)
11. Mix Design by I.S. Code method (with Slag Cement)
12. Mix Design by I.S. Code method (with Admixtures Cement)
13. Determination of Grading curve of Mix aggregate & sieve analysis
Determination of Compressive strength of concrete by non destructive test – Rebound Hammer

List of Equipments / Machine Required:

Slump Cone with Tamping Rod
Concrete Cubes (15 x 15 x 15) cm³
Tray (45 x 60) cm², (60 x 60) cm², (30 x 45) cm²
Trowel (6 Nos.)
I.S. Sieves for Coarse and Fine Aggregate
Compression Testing Machine (200 T)
Weighing Balance
Sieve Shaker
Compaction Factor Test Apparatus
Vee-Bee Consistometer
Flow Table
Longitudinal Compressometer
Cylindrical Mould
Concrete Test Hammer
Graduated Glass Cylinder (500 ml, 1000 ml)
Beaker (500 ml)
Rebound Hammer

Recommended Books:

Lab Manual Concrete – M.L. Gambhir (Tata McGraw Hill)
Concrete Technology – M.S. Shetty (S. Chand & Co.)
Concrete Technology – M.L. Gambhir (Tata McGraw Hill)

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: VI
Subject: Managerial Skills
Total Practical Periods: 28
Total Marks in End Semester Exam: 40
Minimum number of class test to be conducted: 2

Branch: Common to all branches
Code: 300625 (46)
Total Tut Periods: NIL

Unit-I

Managerial Communication Skills: Importance of Business Writing: writing business letters, memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication- presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.

Unit-II

Managerial skills: Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brain storming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive.

Unit-III

Proactive Manager: How to become the real you: The journey of self-discovery, the path of self-discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self assessment.

Unit-IV

Attitudinal Change: Meaning of attitude through example, benefits of positive attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate?

Unit-V

Creativity – a managerial skill, Trying to get a grip on creativity.
Overview of Management Concepts: Function of Management: Planning, organizing, staffing, controlling.

Text & Reference Books:

1. Basic Managerial skills for all by E.H. McGrawth, Prentice Hall India Pvt Ltd,2006
2. How to develop a pleasing personality by Atul John Rego, Better yourself bools, Mumbai, 2006
3. The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
4. How to Success by Brian Adams, Better Yourself books, Mumbai, 1969