

Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING & EXAMINATION

B.E. VIII 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.	320811 (20)	Structural Engineering Design - IV	4	1	-	80	20	20	120	5
2	Civil Engg.	320812 (20)	Water Resources Engineering - II	4	1	-	80	20	20	120	5
3	Civil Engg.	320813 (20)	Computer Applications in Civil Engineering	4	1	-	80	20	20	120	5
4	Refer Table -3		Elective - III	3	1	-	80	20	20	120	4
5	Refer Table -4		Open Elective - IV	3	1	-	80	20	20	120	4
6	Civil Engg.	320821 (20)	Structural Engineering Drawing - II Lab	-	-	3	40	-	20	60	2
7	Civil Engg.	320822 (20)	Water Resources Engineering Drawing Lab	-	-	3	40	-	20	60	2
8	Civil Engg.	320823 (20)	Computer Applications in Civil Engineering Lab	-	-	3	40	-	20	60	2
9	Civil Engg.	320824 (20)	Major Project	-	-	5	100	-	80	180	3
10	Civil Engg.	300825 (20)	Report Writing and Seminar	-	-	2	-	-	40	40	1
11			Library	-	-	1	-	-	-	-	-
Total				18	5	17	620	100	280	1000	33

L- Lecture

P- Practical

CT- Class Test

T- Tutorial

ESE- End Semester Exam

T A- Teacher's Assessment

Table -3			
Professional Elective III			
Environmental Engineering Group			
S.No.	Board of Study	Subject Code	Subject
1	Civil Engg.	320871 (20)	Industrial Waste Treatment
2	Civil Engg.	320872 (20)	Advanced Environmental Engineering
3	Civil Engg.	320873 (20)	Environmental Pollution and Management
4	Civil Engg.	320874 (20)	Air Pollution and Control Measures
Structural Engineering Group			
5	Civil Engg.	320875 (20)	Prestressed Concrete Structures
6	Civil Engg.	320876 (20)	Analysis of Framed Structures
7	Civil Engg.	320877 (20)	Seismic Design of Structures
Water Resources Engineering Group			
8	Civil Engg.	320878 (20)	Open Channel Flow
9	Civil Engg.	320879 (20)	Water Resources Planning and Management
10	Civil Engg.	320880 (20)	Water Shed Management

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Table –4

Open Elective -IV			
S.No.	Board of Studies	Code	Name of Subject
1	Management	300881 (36)	Enterprise Resource Planning
2	Information Technology	300882 (33)	E-Commerce & strategic IT
3	Management	300883 (36)	Technology Management
4	Information Technology	300884 (33)	Decision Support & Executive Information system
5	Computer Science & Engg.	300885 (22)	Software Technology
6	Management	300886 (36)	Knowledge Entrepreneurship
7	Management	300887 (36)	Finance Management
8	Management	300888 (36)	Project Planning, Management & Evaluation
9	Mechanical Engg.	300889 (37)	Safety Engineering
10	Computer Science & Engg.	300890 (22)	Bio Informatics
11	Mechanical Engg.	300891 (37)	Energy Conservation & Management
12	Nanotechnology	300892 (47)	Nanotechnology
13	Management	300893 (36)	Intellectual Property Rights
14	Mechanical Engg.	300894 (37)	Value Engineering
15	Civil Engg.	300895 (20)	Disaster Management
16	Civil Engg.	300896 (20)	Construction Management
17	Civil Engg.	300897 (20)	Ecology and Sustainable Development
18	Chem. Engg.	300898 (19)	Non Conventional Energy Sources
19	Electrical Engg.	300899 (24)	Energy Auditing and Management

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: 8th
Subject: Structural Engineering Design-IV
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320811 (20)
Total Tutorial Periods: 12

DURATION OF END SEMESTER EXAM: 4 HOURS

Unit 1

Design of Combined Footings, Rectangular, Trapezoidal and Strap beam type & raff foundation.

Unit 2

Design of Retaining Walls, Cantilever and Counterfort

Unit 3

Design of Tanks, Rectangular and Circular, resting on ground and overhead type with flexible and fixed base, Intze Type

Unit 4

Bridges, Design of super structure for slab bridge and T-Beam bridge for Highways

Unit 5

Prestressed Concrete, Introduction to Prestressed Concrete, Pre-tensioning and Post-tensioning, Different Systems, Losses in Prestress, Permissible stress in Concrete and Steel, Design of Simply supported beam with symmetrical sections, use of IS code

Name of Text Books:

RCC Structures – B.C. Punmia (Laxmi Publications)
Prestressed Concrete – N. Krishna Raju (New Age Publications)
RCC Design – Sinha & Roy (S. Chand & Co.)

Name of Reference Books:

RCC Structures – N. Krishna Raju (New Age Publications)
RCC Structures (Vol. – I & II) – O.P. Jain (Nem Chand Publications)
Bridge Engineering – R.K. Raina
IS code

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th

Subject: Water Resources 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: 320812 (20)

Total Tutorial Periods: 12

DURATION OF END SEMESTER EXAM: 4 HOURS

Unit 1

Types of Dams, Suitability of a type of dam, Gravity dams – Forces acting on dams, failure of dams and criteria for structural stability, Overturning, Compression or crushing, tension, sliding, principal and shear stress, stability analysis, Elementary profile of a gravity dam, High and low gravity dams, Profile from practical considerations, Design considerations, Openings in dams, Functions and Effects of opening, Joints, Keys and Water stops in gravity dams, Foundation treatment.

Earth Dams

Types of Earth fill dams, design criteria, Causes of failures, Control of Seepage, Stability of slopes.

Unit 2

Spillways and Energy Dissipaters

Introduction, essential requirements of a spillway, spillway capacity, components, Types of spillways, Design of Ogee Spillway, Energy Dissipation below spillways, Types of Energy dissipater, Hydraulic jump as energy dissipater, Stilling basins, design of stilling basin, USBR stilling basins, standard basins.

Unit 3

Diversion Headworks

Introduction, Types of diversion works, location and components, Weir and Barrage, Effect of construction of weir on the river regime, Causes of failures of Weirs on permeable foundations, their remedies, Bligh's creep theory, Lane's Theory, Theory of seepage flow, Khosla's theory, Design of Vertical drop Weir, Design of Glacis Weir, Canal head regulator.

Unit 4

Regulation Works

Introduction, Definition of falls, necessity and location of falls, Design and comparative study of the main types of falls, Cross regulator and distributary regulators, their designs.

Hydraulic Gates

Control equipments for out-lets, spillway gates, types, design criteria for radial gates, air vents.

Unit 5

Cross Drainage Works

Introduction, types, suitability, design of various types of C-D Works, Aqueduct, Syphon Aqueduct, Super Passage, Syphon, level crossing, inlets and outlets.

Channel Transition

Design of channel transition-expansions and contractions, curves for sub-critical and super critical flows.

Name of Text Books:

Irrigation Engineering and Hydraulic Structures – S.K. Garg (Khanna Publications)

Irrigation Engineering – B.C. Punmia (Laxmi Publications)

Name of Reference Books:

Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book House)

Theory and Design of Irrigation Structures (Volume – I & II) – Varshney (Nem Chand Bros.)

Irrigation Engineering – Asawa G.L. (New Age International Publications)

Fundamentals of Irrigation Engineering – Bharat Singh (Nem Chand & Bros.)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th

Subject: Computer Applications in Civil Engineering

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: Civil Engineering

Code: 320813 (20)

Total Tutorial Periods: 12

Unit 1

Fluid Mechanics Applications

Flowcharts, Algorithms and C++ programs for – Flow through pipes, Computation of friction factor, Hardy Cross method of water supply distribution, Determination of depth of flow and discharge in rectangular and circular open channels.

Unit 2

CPM and survey applications

Flowcharts, Algorithms and C++ programs for – Determination of earliest expected time for an activity, Network analysis and determination of critical path, Survey adjustments, Determination of RL of various points by Rise & Fall and HI methods.

Unit 3

Geotechnical Engineering Applications

Flowcharts, Algorithms and C++ programs for – Determination of vertical effective stress at a given depth for any soil profile and water table conditions, Determination of bearing capacity of soil for given soil and water table conditions, Determination of one dimensional preconsolidation settlement under compacted fill, Determination of horizontal and vertical hydraulic conductivities for flow through anisotropic soils.

Unit 4

Structural Analysis Applications

Flowcharts, Algorithms and C++ programs for – Computation of SF & BM at any desired section of a simply supported beam for any loading conditions, Analysis of portal frames by moment distribution method, Determination of maximum shear force at a section of a simply supported beam subjected to a system of rolling loads, Determination of maximum bending moment at a section of a simply supported beam subjected to a system of rolling loads.

Unit 5

Structural Design Applications

Flowcharts, Algorithms and C++ programs for – Design of Simply supported beams, Design of Columns, Design of Slabs, Design of Foundations.

Name of Text Books:

Let us C++ – Yeshwant Kanitkar (BPB Publications)

Problem Solving with C++ – Savitch (Addison Wesley Publication)

Name of Reference Books:

C++ Interactive Course – Lafore (BPB Publications)

C++ Components and Algorithms – et. al. (BPB Publications)

Object Oriented Programming in Turbo C++ – Rober Lafore (Galgotia Publications)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th

Subject: Industrial Waste Treatment

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: Civil Engineering

Code: 320871 (20)

Total Tutorial Periods: 12

Unit 1

General

Effect of discharge of industrial wastewaters on streams, land and environment, Importance and scope, Problems involved in treatment, Variation in quality and quantity of industrial wastewaters.

Standards & Criteria

Indian standards for discharge of treated wastewaters onland, into municipal sewer and natural water courses.

Sampling of Wastewaters

Representative sample, Grab and composite samples.

Unit 2

Effluent Quality and Quantity

Approaches to minimization – good house keeping, equalization and neutralization by mixing of different effluent streams; recycling of wastewater streams. Process modifications in terms of raw materials and chemicals used, Treatment of industrial wastes, Removal of dissolved and suspended solids, Organic waste treatment processes, Sludge treatment and handling.

Unit 3

General Approaches to Planning of Industrial Wastewater Treatment and Disposal

Equalization and proportioning, Neutralization

Treating different effluent streams separately

Treating different streams jointly after mixing them partly or fully

Including / excluding domestic wastewater along with the industrial waste

Treating industrial wastewaters along with town waste.

Unit 4

General Approaches for Handling and Treatment of Specific Characteristics of Industrial Wastewaters

Stream Water Quality, DO Sag Curve, etc. Approaches for treating wastes having shock loads, colours, toxic metal-ions, refractory substances, e.g., ABS and other detergents, growth inhibiting substances such as insecticides, high concentration of nutrients (N.P.K., etc.), oil and grease, suspended solids, BOD., hot wastes, wastes with acidity, alkalinity, etc.

Unit 5

Process Flow Diagrams, Characteristics and Treatment of Various Industrial Wastes

Industrial wastes of pulp and paper, textile, tannery, food, canning, sugar mill, distillery, dairy, pharmaceutical, electroplating, etc.

Industrial pollution abatement measures, referring to case studies in fertilizer industries, textile, petroleum refineries and distilleries.

Name of Text Books:

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

Elements of Environmental Engineering – K.N. Duggal (S. Chand & Co., New Delhi)

Name of Reference Books:

The Treatment of Industrial Wastes – Besseliere, E.B. and Schwartz, M. (McGraw Hill Kogakusha Ltd., New Delhi, 1969)

Industrial Water Pollution – Nemerow, N.L. (Ann Arbour, New York, 1978)

Waste Water Engineering – MetCalaff Eddy (Tata McGraw Hill, New Delhi)

Environmental Engineering – G.N. Pandey & G.C. Karney (Tata McGraw Hill, New Delhi)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Advanced Environmental 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: 320872 (20)
Total Tutorial Periods: 12

Unit 1

Concept of ecological principles, fundamental constituents of environment, Concept of productivity, Pollution and environmental health, pollution cost, Monitoring of pollution, environmental pollution, strategy for a livable environment, international institutions for environmental management.

Unit 2

Air Pollution, introduction, effect of air pollution on the environment, sources of air pollution and control, biomedical aspects of air pollution, Meteorological aspects of air pollution, lapse rate, temperature inversion, adverse effects of air pollution.

Sources and effects of air pollutants like CO, nitrogen oxides, sulphur oxides, hydrocarbons, particulate matters.

Unit 3

Water Pollution, What is water pollution, drinking water standards, quality of water for other uses, stream pollution and self purification natural streams, Streeter-Phelps Water Quality Model.

Biological treatment, design of A.S.P., trickling filter, oxidation pond, sludge treatment and disposal, disposal system and effluent discharge standards.

Unit 4

Air pollution monitoring, stack monitoring system, high volume sampler, air quality standards for ambient air, mathematical modeling in air of pollution control, Box model, Gaussian Plume Model, air pollution from mobile sources and their control.

Unit 5

Reclamation of waste water, radio active waste management, eutrophication of lakes, measurement and detection of eutrophication, acid rain, global warning and green house effect, ozone depletion.

Indoor air pollution control measures, Occupational diseases and their impact on environment.

Name of Text Books:

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

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

Name of Reference Books:

- (1) Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).
- (2) Water Supply and Sanitary Engineering – G.S. Birdi (Dhanpat Rai Publications).
- (3) Introduction to Environmental Science – Y. Anjaneyulu (B.S. Publications).
- (4) Environmental Science and Engineering – Henry and Heinke (Pearson Education).
- (5) Waste Water Engineering – Metcalf Eddy (Tata McGraw Hill, New Delhi).

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Environmental Pollution and Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320873 (20)
Total Tutorial Periods: 12

Unit 1

Basic principles of environmental management, its Pollution and control, Environmental Policies and Legislation, Rules, acts, standards, criteria, specification, nature and scope of environmental problems.

Unit 2

Ecology of population, population attributes, world population growth and the effect of over crowding on ecology, economy and the future of man.

Unit 3

Environmental Research Methodology, approaches, method of Data collection, sampling systems, approach to environmental problems, health and environmental implications of solid waste management, Fate of pollutants in air, water, soil and ground water.

Unit 4

Management and handling of hazardous substances, Sanitary land fills, incineration, composting, hydropulping, pyrolysis.
Environmental Audit, The Indian Scenario, definition of audit, procedure of auditing.

Unit 5

Introduction to sustainable development, Definitions, strategies for sustainable development, environmental debts, appropriate technologies, related case studies.
Environmental inventory, Environmental Impact Assessment methods, Basic steps for prediction and assessment, water environment, air environment, noise environment.

Name of Text Books:

Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).
Introduction to Environmental Science – Y. Anjaneyulu (B.S. Publications)

Name of Reference Books:

Introduction to Environmental Engineering and Science – Masters, G.M. (Prentice Hall of India Pvt. Ltd., 1991)
Waste Water Engineering – Metcalf Eddy (Tata McGraw Hill, New Delhi).
Introduction to Environmental Science – Y. Anjaneyulu (B.S. Publications).
Environmental Science and Engineering – Henry and Heinke (Pearson Education).
Waste Water Engineering – Metcalf Eddy (Tata McGraw Hill, New Delhi).

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Air Pollution and Control Measures
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320874 (20)
Total Tutorial Periods: 12

Unit 1

Air Pollution

Problem, Definitions, Classification of pollutants, characteristics and sources.

A.P. Monitoring

Measurement of stack gases, Sampling methods, Difficulties in sampling, sampling of SPM, stack sampling techniques.

Unit 2

Air pollution meteorology, stability class condition, plume behaviour, topographical effects on air pollution, wind profiles, wind roses.

Gaussian plume models, assumptions and limitations of GPM, problem on modelling.

Unit 3

SO_x sources, ambient concentrations, test methods, SO_x control techniques, effects of SO_x on human, animal health, plants and on materials.

NO_x sources, ambient concentrations, test method control techniques, effects of NO_x on human health, animal health, plants and on materials.

Particulate size distribution, collection and removal mechanics.

Unit 4

Major air pollution disaster episodes, special diseases caused by air pollution, symptoms of chronic air pollution.

Mechanisms of deterioration in polluted atmospheres, effect of air pollution on art treasures in India.

Unit 5

Air quality criteria and emission standards, US and Indian standards, air pollution act, constitution, power and functions of the boards.

Global effects of air pollution – Green house effect, acid rains, ozone layer depletion, etc.

Name of Text Books:

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

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

Name of Reference Books:

Air Pollution – Henry C. Perkins, (McGraw Hill Kogakusha Ltd., Tokyo, Japan, 1974)

Air Pollution – Stern, Arthur C. (Academic Press, New York, USA, 1977)

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

Waste Water Engineering – Metcalf Eddy (Tata McGraw Hill, New Delhi).

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Prestressed Concrete Structures
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320875 (20)
Total Tutorial Periods: 12

Unit 1

Methods, Systems and Materials

Basic principles, methods and systems of prestressing, external, internal, full, partial, pre-tensioning and post-tensioning, quality of concrete and steel, I.S. Code provisions for allowable stresses, Advantages of prestressing and importance of high strength materials.

Unit 2

Analysis of Structures for Flexure

Cases of axial and eccentric prestressing allowing suitable percentage loss of prestress. Stresses in concrete at various stages, lever arm concept and center of pressure, pressure line, kern distances, load balancing cable profiles, critical span (for solid slabs only), Efficiency of a section.

Unit 3

Losses of Prestressing

Various types of losses of prestress and their calculation, loss due to friction, I.S. Code provisions, Elastic shortening due to successive tensioning of cables.

Design of section for flexure

I.S. Code provisions for cover and spacing, standard Fressinet and Gifford Udall cables, Design of beams and slabs, cable zones and profiles.

Unit 4

Composite Beams

Different types, Loading conditions, analysis for stresses, differential shrinkage.

Bond and Anchorage

Bond stress and its significance in pre-tensioned beams, transmission length, determination of bursting force due to anchor zone stresses and provision of steel according to I.S. Code for prestressed concrete.

Shear

Calculation of diagonal tension and its inclination (including vertical prestressing also) provision of steel according to elastic method and I.S. Code method, advantages of prestressing.

Unit 5

Limit State Design

Limit state of serviceability and strength, calculation of ultimate bending moment for given sections, advantages of limit state method over working stress method.

Miscellaneous uses

Analysis and design of poles and circularly prestressed pipes and tanks.

Name of Text Books:

Prestressed Concrete – Krishna Raju N. (New Age International)

Name of Reference Books:

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Analysis of Framed Structures
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320876 (20)
Total Tutorial Periods: 12

Unit 1

Analysis of Indeterminate beams and frames by Kani's Method, slope deflection method.

Unit 2

Approximate Methods

Analysis of multistoreyed frames for horizontal loads by Cantilever and Portal Methods.
Dead and Live Load (Substitute Frame) Analysis for multistoreyed buildings.

Unit 3

Flexibility Method

Introduction to Matrix method of analysis, formulation of flexibility matrices, application to simple problems involving not more than three unknowns.

Unit 4

Stiffness Method

Formulation of stiffness matrices, application to simple problems involving not more than three unknowns.

Unit 5

Finite Element Method

Fundamentals, Element DOF's, Variational functions. Application of Rayleigh Ritz method and Galerkin method to FEM – Solution methodology, spring and beam Elements. Cartesian and natural co-ordinates, Assembly and solution techniques for Matrix and truss structures

Name of Text Books:

Basic Structural Analysis – C.S. Reddy (Tata McGraw Hill)
Structural Analysis (Vol. – II) – Gupta, Pandit G.S. and Gupta S.P. (Tata McGraw Hill, New Delhi, 1999)

Name of Reference Books:

Matrix Finite Element Computer and Structural Analysis – Mukhopadhyaya (Oxford and IBH Publishing Co.)
Computational Structural Mechanics – S. Rajashekar and G. Sankarasubramaniam (Prentice Hall of India, 3E Edition, 2001)
Structural Analysis (2nd Edition) – Alexander Chajas (Prentice Hall, Engineering and Engineering Mechanics Series – 1990)
Introduction to Finite Elements in Engineering – Chandrupatla T.R. & Belegundu A.D. (Prentice Hall of India, 1996)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Seismic Design of Structures
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320877 (20)
Total Tutorial Periods: 12

Unit 1

Engineering seismology

Causes of earthquakes; seismic waves; magnitude, intensity and energy release, characteristics of strong earthquake ground motions, Introduction to theory of vibrations - Flexibility of long and short period structures, concept of response spectrum, Seismic zones.

Unit 2

Seismic design concepts

Desirable features of earthquake resistant buildings, Building forms for earthquake resistance, Seismic design philosophy, Performance of buildings in past earthquakes, Lessons from structural damage during past earthquakes, Equivalent static lateral earthquake force, codal provisions

Unit 3

Structural Dynamics – Response of single degree freedom system, free & forced vibrators Masonry buildings

Seismic design based on IS Code only and detailing of masonry buildings,.
Rcc Buildings- Seismic design based on IS Code only and detailing of RCC buildings .
Detailing of drawing minimum 6 sheets

Unit 4

Steel Buildings

Seismic design and detailing of Steel buildings.

Name of Text Books:

Dynamics of Structures: Theory and Application to Earthquake Engineering (2nd edition) – Anil K Chopra (Pearson Education Publication)
IS 1893, IS 13920, IS 4326, IS 13828, Bureau of Indian Standards, New Delhi

Name of Reference Books:

Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication)
Fundamentals of Vibrations – Anderson, R.A. (Mc Millan)
Vibration and Structural Dynamics – Timoshenko, S. (VanNostrand Co.)
Vibration and Structural Dynamics – Mukyopadhyaya (Oxford & IBH)
Dynamics of Structural Dynamics- R.W. Clough & J Penzien (Mcgraw Hill Publication)
Structural Dynamics (Theory & computations)- Mario Paz (CBS Publishers & Distributions New Delhi)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Open Channel Flow
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320878 (20)
Total Tutorial Periods: 12

Unit 1

Introduction

Difference between open channel flow and pipe flow, geometrical parameters of a channel, continuity equation.

Uniform flow

Chezy's and Manning's equations for uniform flow in open channel, velocity distribution, most efficient channel section.

Unit 2

Energy and Momentum Principles

Critical depth, concepts of specific energy and specific force, application of specific energy principle for interpretation of open channel phenomena, flow through vertical and horizontal contractions.

Unit 3

Non-Uniform Flow in Open Channel

Equation of gradually varied flow and its limitations, flow classification and surface profiles, integration of varied flow equation by analytical, graphical and numerical methods, flow in curved channels.

Unit 4

Hydraulic Jump, Surges, Water Waves

Classical hydraulic jump, evaluation of the jump elements in rectangular and non-rectangular channels on horizontal and sloping beds, equation of motion for unsteady flow, open channel surge, celerity of the gravity wave, deep and shallow water waves.

Unit 5

Spatially-varied flow

Introduction, SVF with increasing discharge, differential equation of SVF with increasing discharges, control point, classification and solutions, profile computation, SVF with decreasing discharge, differential equation for SVF with decreasing discharge, computations.

Name of Text Books:

Fluid Mechanics – A.K. Jain (Khanna Publication)
Open Channel Flow – Subramanya (Tata McGraw Hill, New Delhi)

Name of Reference Books:

Engineering Fluid Mechanics (including Hydraulic Mechanics) (2nd Edition) – Garde, R.J., and A.G. Mirajgaoker (Nem Chand & Bros., Roorkee, 1983)
Flow Through Open Channels – Ranga Raju, K.G. (Tata McGraw Hill, New Delhi, 1993)
Experimental Fluid Mechanics (Vol. 2) – Asawa, G.L. (Nem Chand and Bros., 1992)
Open Channel Flow – Ven Te. Chow (McGraw Hill)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Water Resources Planning and Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320879 (20)
Total Tutorial Periods: 12

Unit 1

Introduction

Role of water in national development, assessment of water resources of country, scope of water resources development vis-a-vis environment, Irrigation development in India, utilisation of Irrigation potential.

Unit 2

Planning

Water resources planning process; planning for single purpose and multipurpose projects, estimation of different water needs and project formulations, comparison of alternatives, cost-benefit analysis.

Unit 3

Water Resources Systems

Definition, types of system, optimization techniques, system approach, system analysis, linear programming, formulation of a linear programming problem, formulation with different types of constraints, graphical analysis, graphical solution, simplex method, optimization techniques and systems approach.

Unit 4

Management

Evaluation and monitoring of water quantity and quality, managing water distribution networks for irrigation, flood control and power generation, inter-basin transfer of water, conjunctive use of surface and ground water.

Unit 5

Modelling

Water quantity and quality modelling, evaluation of impacts of water resources projects on river regimes and environment, reservoir sedimentation and watershed management.

Name of Text Books:

Principles of Water Resources Planning – Good Man, A.S., (Prentice Hall, Inc., Englewood Cliffs, N.J. 1984.)
Water Resources Engineering – Linsley, R.K. and Franzini, J.B., (3rd Edition) (McGraw Hill, New York, 1979)

Name of Reference Books:

Water Resources System, Planning and Management – M.C. Chaturvedy (Tata McGraw Hill)
System Approach to Water Management – Biswas A.K. (Tata McGraw Hill)
Water Resources System, Planning and Management – Helweg O.J. (John and Wiley & Sons)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Watershed Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: Civil Engineering
Code: 320880 (20)
Total Tutorial Periods: 12

Unit 1

Soil and Water, Issues related to plant life like composition of soil, water requirement of crops, necessary conditions for plant growth etc.

Soils, their origin and classification.

Unit 2

Land classification for WM, Land capability rating, determination of land capability class, land capability and suitability surveys.

Unit 3

Soil erosion, problem, types, conservation, and control measures in agricultural and non-agricultural land. Water conservation and Harvesting, Agronomical measures in soil and water conservation. Examples and critical reviews.

Unit 4

Watershed Management, Approach in Govt. programmes, people's participation, conservation farming, watershed-management planning, identification of problems, objectives and priorities, socioeconomic survey, use of tools like GIS.

Unit 5

Hill slope processes, forest and land use, hill slope conservation. Bad lands, bad land development.

Name of Text Books:

Watershed Management – J.V.S. Murthy (New Age International Ltd.)

Name of Reference Books:

Watershed Management – B.M. Tideman (-----)

Modern physical geography – Strahler A.N. and Strahler A.H. (-----)

Chhattisgarh Swami Vivekanand Technical University, Bilai

Semester: 8th
Subject: Structural Engineering Drawing-II Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Civil Engineering
Practical Code: 320821 (20)

Experiments to be performed (Min 10 experiments)

1. Details of reinforcement in a simply supported RCC beam (singly reinforced) with the given design data regarding the size and number of bars, stirrups their size and spacing.
2. Details of reinforcement in a simply supported RCC beam (doubly reinforced) with the given design data regarding the size and number of bars, stirrups their size and spacing.
3. Details of reinforcement in a simply supported RCC beam (T section) with the given design data regarding the size and number of bars, stirrups their size and spacing.
4. Details of reinforcement in a one way slab with the given design data regarding the size and number of bars, their size and spacing.
5. Details of reinforcement in a two way slab with the given design data regarding the size and number of bars, their size and spacing.
6. Details of reinforcement in a stair case with the given design data regarding the size and number of bars, their size and spacing.
7. Details of reinforcement for a RCC rectangular column with isolated footing.
8. Details of reinforcement for a RCC circular column with isolated square footing.
9. Detailing of Combined footings.
10. Detailing of Retaining walls.
11. Detailing for Water Tanks.
12. Detailing for R.C.C. slab Bridge.
13. Detailing for R.C.C. T-Beam Bridge.
14. Detailing for Prestressed Concrete Girder.
15. Bar bending schedules for few of the above items.

Field Visit (Minimum 3 times)

Study of complete standard drawing

- a. Multistoried building
- b. Bridge
- c. Water tank

List of Equipments / Machine Required:

List of Equipments – Not Required.

Recommended Books:

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Water Resources Engineering Drawing Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Civil Engineering
Practical Code: 320822 (20)

Experiments to be performed (Min 10 experiments)

1. Drawing of gravity dam section showing following details: openings in dams, joints, key and water stops.
2. Drawing of Earth dam section showing details of different types of earth dam.
3. Drawing of Ogee Spillway section.
4. Drawing of different types of energy dissipater and stilling basins.
5. Drawing of layout of diversion head works showing its different components.
6. Drawing of vertical drop weir.
7. Drawing of Glacis weir.
8. Drawing of canal head regulator.
9. Drawing of main types of canal fall.
10. Drawing of different types of hydraulic gates.
11. Drawing of aqueduct.
12. Drawing of Syphon Aqueduct.
13. Drawing of Super Passage.
14. Drawing of Canal Syphon.
15. Drawing of Level Crossing and inlets and outlets.

List of Equipments / Machine Required:

Recommended Books:

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Computer Applications in Civil Engineering Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Civil Engineering
Practical Code: 320823 (20)

Experiments to be performed (Min 10 experiments)

1. A C++ program to determine the distribution of flow in a pipe network using Hardy Cross method.
2. A C++ program for the computation of friction factor of a circular pipe.
3. A C++ program for determination of earliest expected time for an activity.
4. A C++ program for network analysis and determination of critical path of a CPM network.
5. A C++ program for determination of Most Probable Values of observation by Normal Equation Method.
6. A C++ program for determination of vertical effective stress at a given depth for any soil profile and water table conditions.
7. A C++ program for determination of bearing capacity of soil for given soil and water table conditions.
8. A C++ program for determination of one dimensional preconsolidation settlement under compacted fill.
9. A C++ program for determination of horizontal and vertical hydraulic conductivities for flow through anisotropic soils.
10. A C++ program for computation of SF & BM at any desired section of a simply supported beam for any loading conditions.
11. A C++ program for analysis of portal frames by stiffness method and moment distribution method
12. A C++ program for determination of maximum shear force at a section of a simply supported beam subjected to a system of rolling loads
13. A C++ program for determination of maximum bending moment at a section of a simply supported beam subjected to a system of rolling loads.
14. A C++ program for design of simply supported RCC beam.
15. A C++ program for design of RCC column.

List of Equipments / Machine Required:

- (i) PC system.
- (ii) Turbo C++ compiler.

Recommended Books:

- (1) Let us C++ – Yeshwant Kanitkar (BPB Publications)
- (2) Problem Solving with C++ – Savitch (Addison Wesley Publication)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII
Subject : Report Writing and Seminar
Total No. of periods : 28
Total marks in End Semester Exam: Nil
Minimum Number of class test to be conducted: Two

Branch: Common to all branches
Code: 300825 (20)
Total Tutorial Periods : Nil
Teacher's Assessment: 40 marks

Unit -I

Introduction to Technical Writing: how differs from other types of written communication Purpose of technical writing, Correspondence: prewriting, writing and rewriting Objectives of Technical Writing. Audience Recognition: High-tech audience, Low tech audience, Lay audience, Multiple Audience.

Unit - II

Correspondence: Memos, Letters, E-mails, Its differentiation, types of letters, Document Design, its importance, Electronic Communication: Internet, Intranet, extranet, Writing effective e-mail.

Unit - III

Summary: Report Strategies, Effective style of technical report writing: Structures: content, introduction, conclusions, references, etc., Presentation, Writing first draft, revising first draft, diagrams, graphs, tables, etc. report lay-out.

Unit -IV

Report Writing: Criteria for report writing, Types of Report: Trip report, Progress report, lab report, Feasibility report, project report, incident report, etc. Case Studies.

Unit -V

Proposals & Presentation: Title page, Cover letter, Table of Content, list of illustrations, summary, discussion, conclusion, references, glossary, appendix, Case Studies. Oral Presentation/ Seminar:

Text Books:

1. Sharon J. Gerson & Steven M. Gerson "Technical Writing - Process& Product", Pearson Education.

Reference Books:

1. Sunita Mishra, "Communication Skills for Engineers" Pearson Education
2. Davies J.W. "Communication for engineering students", Longman
3. Eisenberg, "Effective Technical Communication", Mc. Graw Hill.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : BE 8th
SUBJECT: REPORT WRITING & SEMINAR
Total No. of periods : 2 per week
Total marks in End Semester Exam: Nil
Minimum Number of class test to be conducted: Two

Branch: Civil Engineering
CODE: 300825 (25)
Total Tutorial Periods : Nil
Teacher's Assessment: 40 marks

Unit - I

Introduction to Technical Writing: how differs from other types of written communication Purpose of technical writing, Correspondence: prewriting, writing and rewriting Objectives of Technical Writing. Audience Recognition: High-tech audience, Low tech audience, Lay audience, Multiple Audience.

Unit - II

Correspondence: Memos, Letters, E-mails, Its differentiation, types of letters, Document Design, its importance, Electronic Communication: Internet, Intranet, extranet, Writing effective e-mail.

Unit - III

Summary: Report Strategies, Effective style of technical report writing: Structures: content, introduction, conclusions, references, etc., Presentation, Writing first draft, revising first draft, diagrams, graphs, tables, etc. report lay-out.

Unit -IV

Report Writing: Criteria for report writing, Types of Report: Trip report, Progress report, lab report, Feasibility report, project report, incident report, etc. Case Studies.

Unit -V

Proposals & Presentation: Title page, Cover letter, Table of Content, list of illustrations, summary, discussion, conclusion, references, glossary, appendix, Case Studies. Oral Presentation/ Seminar:

Text Books:

1. Sharon J. Gerson & Steven M. Gerson "Technical Writing - Process& Product", Pearson Education.

Reference Books:

1. Sunita Mishra, "Communication Skills for Engineers" Pearson Education
2. Davies J.W. "Communication for engineering students", Longman
3. Eisenberg, "Effective Technical Communication", Mc. Graw Hill.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VIII
Subject :Enterprise Resource Planning
Total Theory Periods : 40
Total Marks in End Semester Exam : 80
Minimum no. of class tests to be conducted : 2

Branch : Common to All Branches
Code : 300881 (36)
Total Tut Periods : 10

UNIT-I

Conceptual foundation of Business Process reengineering: Role of information Technology and BPR; Process improvement and Process redesign, Process identification and mapping; Role/Activity diagrams, Process Visioning, and benchmarking.
[No of Periods: 8 + 2]

UNIT -2

Enterprise Resource Planning: Evolution of ERP- MRP and MRP II, structure of ERP- two tier architecture, three tier architecture, Electronic data processing, management information system, Executive information system, ERP as an integrator of information needs at various Levels.
[No of Periods: 8 + 2]

UNIT -3

Typical Business Processes: Core processes, Product control, Sales order processing, Purchases, Administrative processes, Human resource, Finance support processes, Marketing, Strategic planning, Research and development, Problems in traditional view.
[No of Periods: 8 + 2]

UNIT -4

ERP models/functionality: Sales order processing, Production scheduling, forecasting, distribution, finance, features of each of the models, description of data flow across each module, overview of supporting databases & packages.
[No of Periods: 8 + 2]

UNIT -5

ERP implementation issues: Opportunities and problems in ERP selection, and implementation; ERP implementation: identifying ERP benefits, team formation, Consultant intervention, Selection of ERP, Process of ERP.
[No of Periods: 8 + 2]

Books:

1. V.K. GARG & N .K. VENKATKRISHNAN:, ERP, Concepts and Practices, PM
2. Rahul V. Altekar, Enterprise wide Resource Planning-theory and practice, PHI

References:

1. ALEXIS LEON: Enterprise Resource Planning, TMH
2. S. SADAGOPAN: MIS, PM
3. V. RAJARAMAN: Analysis and Design of Information Systems, PHI
4. **MONK' & BRADY: Concepts in ERP, Vikas pub, Thomson**

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: **VIII**

Subject: **E-Commerce and Strategic IT**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **80.**

Minimum number of class tests to be conducted: **02**

Branch: **Common to All Branches**

Code:**300882 (33)**

Total Tutorial Periods: **Nil**

UNIT – I Introduction: What is E-Commerce, Forces behind E-Commerce, E-Commerce Industry Framework, and Brief History of E-Commerce. Inter Organizational E-Commerce, Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework

UNIT – II

Network Infrastructure : LAN, Ethernet(IEEE standard 802.3) LAN , WAN , Internet, TCP/IP Reference Model, Domain Name Server , Internet Industry Structure,

UNIT – III

Electronic payment systems, types of electronic payment systems, digital token-based electronic payment systems, smart cards & electronic payment systems, credit card based electronic payment systems, risk and electronic payment systems, designing electronic payment systems.

UNIT – IV

Information Distribution and Messaging: FTP,E-Mail,WWW server,HTTP, Web service implementation, Information publishing , Web Browsers, HTML, Common Gateway Interface

UNIT – V Mobile & wireless computing fundamentals, mobile computing framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication protocols, mobile computing applications, personal communication service.

BOOKS :

1. Frontiers of E-commerce by Kalakota & Whinston (Addison-wesley) E-business roadmap for success by Dr. Ravi Kalakota & Marcia Robinson (addision wesicy)
2. Electronic Commerce By Bharat Bhasker (TMH)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII
Subject Name: Technology Management
Total Theory periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Branch: **Common to All Branches**
Subject Code: 300883 (36)
Total Tutorial periods: 10

Unit I

Technology: - Definitions, Types and Characteristics, Management of Technology (MOT), Technological Environment, Parameters of Technological Environment; Science & Technology in India.
[No of Periods: 8 + 2]

Unit II

Innovation Management: - Invention v/s Innovation, Definition and components of innovation. Types of innovations: Product, Process and system innovations, Understanding Innovation Process.
[No of Periods: 8+ 2]

UNIT III

Technology life cycle, Technology evolution and S-curves of Technology Evolution, Technology Diffusion, Dynamics of Diffusion, Mechanism of Diffusion.
[No of Periods: 8 + 2]

Unit IV

Technology strategies & Intelligence: Technology Strategy & types, Models for technology strategy formulation Definition of Technology Intelligence, Technology Audit, Process of Technology Intelligence: Technology Scanning, Monitoring, Forecasting and Assessment.
[No of Periods: 8 + 2]

Unit V

Acquisition and technology transfer. **Over view of - GATT, Intellectual property rights (IPR)**
[No of Periods: 8 + 2]

Texts Books:

1. V. K. Narayanan, "Managing Technology and Innovation for competitive advantage", Pearson Education.
2. Tarek Khalil, "Management of Technology", McGraw Hill.

Reference Books:

1. Lowell Steele, "Managing Technology", McGraw Hill.
2. R. A. Burgelman and M. A. Maidique, "Strategic Management of Technology and Innovation", Irwin.
3. Plsek, Crativity, Innovation and Quality, PHI

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Decision Support and Executive Information System

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Common to all Branches

Code: 300884(33)

Total Tut Periods: Nil.

UNIT-I Decision Support System:

What is a DSS, Decision Making Rational Decisions, Definitions of Rationality, Bounded Rationality and Muddling Through, The Nature of Managers, Appropriate Data Support, Information Processing Models, Group Decision Making?

UNIT-II Component OF DSS:

Data Component : Information and its Usefulness, Characteristics of Information, Databases to Support Decision Making, Database Management Systems, Data Warehouses, Data Mining and Intelligent Agents

Model Component:-Models Representation Methodology, TimeModel Based ManagementSystems, Access to Models Understandability of Results, Integrating Models Sensitivity of aDecision, Brainstorming and Alternative Generation, Evaluating Alternatives, Running External Models.

Mail Component: Integration of Mail Management Examples of Use implications for DSS.

Unit-III Intelligence and Decision Support Systems:

Programming Reasoning, Backward Chaining Reasoning, Forward Chaining Reasoning, Comparison, Certainty Factors, User-Interface Component: User Interface Components, The Action Language, Menus, Command Language, I/O Structured Formats, Free Form Natural Language, The Display or Presentation Language, Windowing Representations, Perceived Ownership of Analyses, Graphs and Bias Support for All Phases of Decision Making, The Knowledge Base Modes of Communication

Unit-IV Designing A DSS: Planning for DSS, Designing a Specific DSS, Interviewing Techniques, Other Techniques, Situational Analysis Design Approaches, Systems Built from Scratch, Using Technology to Form the Basis of the DSS, Evaluating a DSS Generator, Using a DSS Generator, The Design Team, DSS Design and Re-engineering Discussion .

Unit-V Implementation and Evaluation of DSS : Implementation Strategy , Prototypes, Interviewing , User Involvement , Commitment to Change, Managing Change, Institutionalize System, Implementation and System Evaluation, Technical Appropriateness, Measurement Challenges , Organizational Appropriateness.

Name Of Text Books:-

Decision Support System By Vicki I Sauter

Management Information system-Gerald V. Post & David L. Anderson

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Software Technology

Total Theory Periods: 4 per week.

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: **Common to All Branches.**

Code: 300885 (22)

Total Tut Periods: Nil.

UNIT-1

ASSEMBLY LANGUAGE PROGRAMMING

Pentium Assembly languages-Registers, Memory Model, Addressing mode, 1source Link, Installation, Assembler Directives.

ASSEMBLER DESIGN

Simple manual Assembler, Assembler Design Process, Load and Go Assembler, Object File Formats.

UNIT-2

LINKERS

Linking -Combining Object Modules, Pass I, Pass II; Library Linking; Position Independent Code (PIC); Shared Library Linking.

LOADERS- Binary Image; Types of Loaders.

UNIT 3

MACROPROCESSORS

Macro in NASM- Local Labels in Macro Body, Nested Macros.; Design of Macroprocessors – Major Data Structures, Macroprocessing Technique, Simple macroprocessors without nesting, Nested calls & definitions

UNIT – 4

COMPILERS

Lexical Analysis; Syntax Analysis; Intermediate Code Generation; Target Code Generation; Optimizing Transformation

UNIT – 5

TEXT EDITORS

Design of a Text Editor ; Data Structures for Text Sequences; Text Document Design; Text view Design

DEBUGGER

Features; Breakpoint mechanism; Hardware support; context of Debugger; Check pointing & reverse Execution

Textbooks

1. SYSTEM SOFTWARE by Santanu Chattopadhyay ; Prentice Hall of India
2. Software Engineering By Roger S Pressman ; Mc-Graw Hill

References

1. Foundations of Software Technology and Theoretical Computer Science, By V. (Venkatesh) Raman: Springer
2. Software Visualization by John Stasko; MIT press
3. Software Engineering By Rajib Mall : PHI

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Knowledge Entrepreneurship

Total Theory Periods: 40

Total Marks in End Semester Exam:80

Minimum no. of class tests to be conducted: 2

Branch: Common to All Branches

Code: 300886 (36)

Total Tut Periods: 12

Unit – I

Introduction: Entrepreneurship in Knowledge economy, abundant & accessible information, implication, impact & consequence, knowledge based opportunities, aims, scope, and objectives.

Unit-II

Managing knowledge & intellectual capital:

Knowledge management, loss of knowledge, knowledge implementation, knowledge creation, property intellectual capital.

Unit-III

Contemporary information problems:

Information overload, winning & losing barrier to entry, emerging issues, customers, investors, myth of inevitable program.

Unit-IV

Creating enterprise cultures:

Working with employer, organizing for entrepreneurship, unity & diversity, ten essential freedoms, freedom of operation, effective issue monitoring, establish search criteria.

Unit-V

Becoming a knowledge entrepreneur:

Entrepreneur qualities, knowledge entrepreneur, challenge of launching new product, creating launch support tool, examples of best practice.

Text & Reference Books

Amrit Tiwana ,The Knowledge Management tool kit, Pearson Education.

Lunlin Conlson, Knowledge Entrepreneur, Thomas Press.

Catheriue L Mann, Knowledge entrepreneurship, Oxford

Heinke Robkern ,Knowledge entrepreneurship,.

Bonnie Montano,Knowledge Management, , IRM Press, London

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: Financial Management
Total Theory Periods: 3
Total Marks in End Semester Exam: 80
Minimum No. Of Class test to be conducted: 2

Branch: **Common to All Branches**
Code: 300887(36)
Total tutorial Period: 12

UNIT I

Financial Management –an overview: Introduction, finance and other disciplines, objectives and scope of financial management, role and responsibility of finance manager.

[No of Periods: 8 + 2]

UNIT II

Working capital management-nature, need, importance and concept of working capital, trade off between profitability and risk, Determining finance mix.

[No of Periods: 8 + 2]

UNIT III

Inventory management-Introduction, objectives, ordering cost, carrying cost, lead time, economic order quantity and safety stock, deterministic model.

[No of Periods: 8 + 2]

UNIT IV

Management of cash-introduction motives for holding cash, objectives of cash management and technique/process of cash management.

[No of Periods: 8 + 2]

UNIT V

Receivables management-introduction, objectives, credit terms, credit policies and collection policies.

[No of Periods: 8 + 2]

Text books:

Basic financial management, M Y Khan and P K Jain, TMH
Financial Management, I M Pandey.

References books:

Financial management and policy, V K Bhalla, Anmol publications pvt. Ltd.
Financial management, Van Horne.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester : VIII
Subject : Project planning management and Evaluation
Total Theory Periods : 40
Total Marks in End Semester Exam :80
Minimum No. Of Class test to be conducted : 2

Branch : **Common to All Branches**
Code : 300888 (36)
Total tutorial Period : 12

UNIT I

Identification of projects-generation and screening of idea, monitoring corporate appraisal, preparing project profiles and project rating index.

UNIT II

Feasibility studies: Market and demand analysis, technical analysis, financial analysis and economic viability.

UNIT III

Project appraisal: Criteria, net present value, internal rate of return, payback period and accounting rate of return method.

UNIT IV

Project management and implementation-
Project planning, project control, prerequisites of implementation. Network techniques of project management-Project evaluation and review technique (PERT) and critical path method (CPM).

UNIT V

Project review and control-
Initial review, performance evaluation, abandonment analysis and its behavioral issues.

Text books:

Project planning, analysis, selection, implementation and review by Prasanna Chandra, TMH.

Reference Books:

Project management-Dr. Harold Kerzner.

Total Project management-Dr. P K Macmillan.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: **Safety Engineering**
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**
Code: 300889 (37)
Total Tutorial Period : 12

UNIT – I

Safety Philosophy and principles of Accident prevention
Introduction, accident, injury, unsafe act, unsafe condition, reportable accidents, need for safety, break down of accidents, hazardous industries.
Theories & Principle of accidents
Casualty, cost of accident, computation of cost, utility of cost data.
Accident reporting & Investigation
Identification of the key facts, corrective actions, classification of facts.
Regulation
American (OSHA) and Indian Regulation.

UNIT – II

Safety Management
Division of responsibility, Location of Safety function, size of safety department, qualification for safety specialist, safety committee – structure and functions.

UNIT – III

Safe Working Condition and Their Development
SOP for various Mechanical equipments, Incidental safety devices and methods, statutory of provisions related to safeguarding of Machinery and working condition.

UNIT – IV

Safety in Operation and Maintenance
Operational activities and hazards, starting and shut down procedures, safe operation of pumps, compressor, heaters, reactors, work permit system, entry into continued spaces.

UNIT – V

Safety in Storage and Emergency Planning
Safety in storage, handling of chemicals and gases, storage layout, ventilation, safety in chemical laboratories, emergency preparedness on site plan, off site plan, toxic hazard control.

TEXT BOOKS

Safety and Accident Prevention in Chemical Operation – H.H. Faweett and Wood
Personal Protective Equipment – NSC Bombay

REFERENCE BOOKS

Ergonomics - P. Krishna Murthy
Fire Prevention Hand Book – Derek James

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Bioinformatics

Total Theory Periods: 4 per week.

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: **Common to All Branches**

Code: 300890 (22)

Total Tut Periods: Nil.

UNIT-1

Bioinformatics-introduction, Application, Data Bases and Data Management, Central Dogma; information search and Data retrieval, Genome Analysis and Gene mapping- Analysis, Mapping, Human Genome Project (HGP).

UNIT-2

Alignment of Pairs and Sequences; Alignment of Multiple Sequences and Phylogenetic Analysis; Tools for similarity Search and Sequence Alignment- FASTA BLAST.

UNIT-3

Profiles and Hidden Markov Models (HMMs); Gene Identification and Prediction-Basics, Pattern Recognition, Methods and Tools; Gene Expression and Micro arrays.

UNIT-4

Protein Classification and Structure Visualization; Protein Structure Prediction; Proteomics; Computational methods-Analysis of Pathways, Metabolic Network Properties, Metabolic Control Analysis, Stimulation of Cellular Activities, Biological Mark Up Languages.

UNIT-5

Drug Discovery-Introduction, Technology and Strategies, Cell Cycle, G-protein, Coupled, Receptors. Computer Aided Drug Design-Introduction, Drug Design Approaches, Designing methods, ADME-Tox Property Prediction.

TEXT BOOKS

- I. BIOINFORMATICS by S.C. Rastogy, 2nd Edition, Prentice Hall of India.
- II. BIOINFORMATICS by V. R Srinivas, Prentice Hall of India

REFERENCES

1. BIOINFORMATIC COMPUTING by Bergeron, MIT Press.
2. Evolutionary Computation in Bioinformatics, Gary B. Fogel, David W. Corne (Editors), 2002
3. Introduction to Bioinformatics, Arthur M. Lesk, 2002, Oxford University Press
4. Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors), 2002, MIT Press

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: Energy Conservation & Management
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**
Code: 300891 (37)
Total Tutorial Period : 12

UNIT – I

Energy Scenario

Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, energy needs of growing economy, long term energy scenario, energy pricing, energy sector reforms, energy and environment, energy security, energy conservation and its importance, re-structuring of the energy supply sector, energy strategy for the future, air pollution, climate change, Energy Conservation Act – 2001 and its features.

UNIT – II

Energy Conservation in Electric Utility and Industry

Energy costs and two-part tariff, Energy conservation in utility by improving load factor, Load curve analysis, Energy efficient motors, Energy conservation in illumination systems, Importance of Power factor in energy conservation – Power factor improvement methods, Energy conservation in industries, case studies.

UNIT – III

Energy in Manufacturing

Introduction, Energy and Environmental Analysis of Products, Energy Consumption in Manufacturing, Energy Conservation, Transportation Systems, Water Conservation, Rules for the Efficient Conservation of Energy and Materials, Laws of Energy and Materials Flows.

UNIT – IV

Heat Recovery System

Sources of waste heat and its potential applications, heat recovery systems in Shell & Tube Heat Exchangers, Plate Heat Exchangers, Tubular Heat Exchangers. Vapour recompression and Energy conservation in Evaporator systems. Thermal Wheel, Heat Pipe, Heat Pumps. Waste Heat Boilers – Low Pressure & High Pressure Applications.

UNIT – V

Energy Conservation Economics

Basic discounting, life cycle costing and other methods, factors affecting economics, energy pricing and incentives for conservation, energy conservation of available work identification of irreversible processes, primary energy sources, Optimum use of prime movers, energy efficient house keeping, energy recovery in thermal systems, waste systems and waste heat recovery in thermal systems, waste heat recovery techniques, conservation in energy intensive industries, thermal insulation.

TEXT BOOKS

1. Energy Management – W.R. Murphy, G. McKay –
2. Energy Management – Paul O'Callaghan –
3. Engineering Economics & Engineering Management – R. Raju – Anuradha Agencies

REFERENCE BOOKS

1. Principles of Energy Conversion – Archie W. Culp – Jr. International Student Edition – McGraw Hill Publishers
2. Energy Management in illuminating System – Kao Chen – CRC Publishers
3. Industrial Energy Recovery - D.A. Reay – Wiley Publishers
4. Thermal Energy Recovery – T.L. Boyer – Wiley Publishers
5. Energy Conservation Through Control – E.G. Shinskey – Academic Press
6. Economics of Solar Energy & Conservation Systems, Vol-I & II – F. Kreith & R.E. West – CRC Press

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: Nanotechnology
Total Theory Periods: 50

Branch: Common to All Branches
Code: 300892 (47)
Total tutorial Period: NIL

Total Marks in End Semester Exam: 80
Minimum No. of Class test to be conducted:2

Unit I : Introduction to nanotechnology: background, definition , basic ideas about atoms and molecules, physics of solid state, review of properties of matter and quantum mechanics

Unit II : Preparation of Nanostructured Materials : Lithography : nanoscale lithography, E-beam lithography, dip pen lithography, nanosphere lithography. Sol gel technique Molecular synthesis, Self-assembly, Polymerization

Unit III : Characterization of Nanostructured materials : Microscopy: TEM, SEM, SPM techniques, confocal scanning microscopy,, Raman microscopy-Basic principles, applicability and practice to colloidal, macromolecular and thin film systems. Sample preparation and artifacts. Polymer fractionation techniques: SEC, FFF, Gel electrophoresis.: Basic theory, principles and practice. Thermal analysis: Basic principles, theory and practice. Micro DSC in the study of phase behavior and conformational change. Mass spectrometry of polymers: MALDI TOF MS – Basic theory, principles and practice. Applicability to proteins, polyethers, controlled architecture systems

Unit IV : Cross-cutting Areas of Application of Nanotechnology : Energy storage, Production and Conversion. Agriculture productivity enhancement Water treatment and remediation. Disease diagnosis and screening. Drug delivery systems. Food processing and storage. Air pollution and remediation. Construction. Health monitoring..Vector and pest detection, and control. Biomedical applications. Molecular electronics. Nanophotonics. Emerging trends in applications of nanotechnology

Unit V : Industrial Implications of Nanotechnology : Development of carbon nanotube based composites. Nanocrystalline silver Antistatic conductive coatings. Nanometric powders. Sintered ceramics. Nanoparticle ZnO and TiO₂ for sun barrier products. Quantum dots for biomarkers. Sensors. Molecular electronics. Other significant implications

References:

1. Guozhong Cao, "Nanostructures and Nanomaterials", Imperial College Press, London
2. Mark Ratner and Daniel Ratner, "A Gentle Introduction to Next Big Thing", Pearson Education 2005

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: Intellectual Property Rights
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum No. Of Class test to be conducted:2

Branch: **Common to All Branches**
Code: 300893 (36)
Total tutorial Period: 12

Unit-I

Basic Concepts of Intellectual Property: Introduction to intellectual property rights, laws and its Scope, Trade Related Aspects of Intellectual Property Rights.

Unit-II

Patents: Introduction to patent law and condition for patentability, Procedure for obtaining patents, Rights of a patentee, Patent infringements, Biotechnology patents and patents on computer programs, Patents from an international perspective.

Unit-III

Trademark and 'geographical Indications: Statutory authorities and registration procedure, Rights conferred by registration, Licensing, assignment and transfer of trademark rights, Trademark infringement, Geographical Indication of Goods & Appellations of Origin.

Unit-IV

Copyright: Registration procedure and copyright authorities, Assignment and transfer of copyright, copyright infringement and exceptions to infringement, Software copyright

Unit-V

Introduction to the law on Industrial Designs, Registration and piracy, International perspective, Introduction to the law on semiconductor layout design, Registration, commercial exploitation and infringement.

Text Books:

1. Vinod V Sople ,Managing Intellectual Property, – PHI
2. Kumar K ,Cyber law, intellectual property and e-commerce security, Dominant Publication and distribution, New Delhi.

Reference Books:

1. Inventors Guide to Trademarks and Patents- Craig Fellenstein, Rachel Ralson- Pearson Education.
2. Intellectual Property –David Bainbridge, Longman

Semester: VIII
Value Engineering
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches** Subject:
Code: 300894 (37)
Total Tutorial Period: 12

UNIT – I

Basic Concepts

Meaning of the term value, basic kind, reasons for poor value, value addition, origin and history. Benefits, relevance in Indian scenario.

UNIT – II

Techniques

Different techniques, organizing value engineering study, value engineering and quality.

UNIT – III

Job Plan

Different phases, General phase, Information phase, Functional Phase, Creation Phase, Evaluation Phase, Investigation Phase, Implementation Phase, Audit.

UNIT – IV

Selection of evaluation of VE Projects

Project selection, method selection, value standard, application of methodology.

UNIT – V

Value Engineering Program

VE operations in maintenance and repair activities, VE Cost, life cycle, cost model, training for VE, general value engineering, case studies.

TEXT BOOKS

Value Engineering – S.S. Iyer – New Age International Publishers, New Delhi
Industrial Engineering & Management – O.P. Khanna – Dhanpat Rai & Sons

REFERENCES

Techniques of Value Analysis and Engineering – L.D. Miles – McGraw Hill, New York
Value Engineering, A Systematic Approach – A.E. Mudge – McGraw Hill, New York
Compendium on Value Engineering – H.G. Tufty – Indo American Society

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII

Subject: Disaster Management

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**

Code: 300895 (20)

Total Tutorial Periods: 12

Unit 1

Nature of disasters – natural and other disasters, Earthquakes, floods, draught, cyclones, fire and other environmental disasters.

Unit 2

Behaviour of structures in disaster prone areas, Disaster zoning, Hazard assessment, Environmental Impact Assessment

Unit 3

Methods of mitigating damage during disasters, disaster preparedness.

Unit 4

Management systems during disasters, Construction Technology for mitigation of damage of structures.

Unit 5

Short-term and long-term relief measures.

Name of Text Books:

Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication)

Dynamics of Structures: Theory and Application to Earthquake Engineering (2nd edition) – Anil K Chopra (Pearson Education Publication)

Name of Reference Books:

Fundamentals of Vibrations – Anderson, R.A. (Mc Millan)

IS – 1893 (Part I): 2002, IS – 13920: 1993, IS – 4326: 1993, IS-13828: 1993

Earth quake engineering damage assessment and structural design – S.F. Borg

Disasters and development – Cuny F (Oxford University Press Publication)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII
Subject: Construction Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**
Code: 300896 (20)
Total Tutorial Periods: 12

Unit 1

The Owner's Perspective

Introduction-The project life cycle-Major Types of Construction-Selection of Professional Services-Construction contractors-Financing of constructed facilities-Legal and regulatory Requirements-The changing Environment of the construction Industry-The Role Project Managers

Unit 2

Organizing for Project Management

What is project management? – Trends in Modern Management-Strategic planning and project programming- Effects of project risks on organization-Organization of Project Participants-Traditional designer-Constructor sequence-Professional construction management-Owner-Builder-Operation-Turnkey operation-Leadership and Motivation for the Project team-Interpersonal behaviour in project organization-perceptions of Owners and Contractors

Unit 3

The Design and Construction Process

Design and construction as an integrated system-Innovation and technological Feasibility-Innovation and technological feasibility-Design Methodology-Functional Design-Physical Structures-Geo-Technical Engineering Investigation-Construction Site Environment-Value engineering-Construction Planning-Industrialized Construction and Prefabrication-Computer -Aided Engineering

Unit 4

Labour, Material and Equipment Utilization

Historical Perspective – Labour Productivity-Factors Affecting Job-Site Productivity-Labor Relations in construction-Problems in collective bargaining-Materials Management-Materials Procurement and Delivery- Inventory control-Tradeoffs of cost in Material Management-Construction Equipment-Choice of Equipment and Standard production Rates-Construction Processes Queues and Resource Bottlenecks

Unit 5

Cost Estimation

Costs Associated with Construction Facilities-Approaches to cost estimation-Type of construction cost estimates- Effects of scale on construction cost-Unit cost-Method of estimation-Methods for allocation of joint costs- Historical cost data-Cost indices-Applications of cost Indices to Estimating- Estimate based on Engineers List of Quantities-Allocation of Construction costs over time-Computer Aided cost Estimation-Estimation of operating costs

Name of Text Books:

Construction Project Management Planning, Scheduling and Control – Chitkara, K.K. (Tata McGraw Hill Publishing Co., New Delhi, 1998)
Project Mangement: A systems Approach to Planning, Scheduling and Controlling – Harold Kerzner (CBS Publishers & Distributors, Delhi, 1988)

Name of Reference Books:

Project management for Construction: Fundamental Concepts for owners, Engineers, Architects and Builders – Chris Hendrickson and Tung Au, (Prentice Hall, Pittsburgh, 2000)
Construction Project Management – Frederick E.Gould (Wentworth Institute of Technology, Vary E.Joyce, Massachusetts Institute of Technology, 2000)
Project Management – Choudhury, S. (Tata McGraw Hill Publishing Co., New Delhi, 1988)
Applied project Engineering and Management – Ernest E. Ludwig (Gulf Publishing Co., Houston, Texas, 1988)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII

Branch: **Common to All Branches**

Subject: Ecology and Sustainable Development

Code: 300897 (20)

Total Theory Periods: 40

Total Tutorial Periods: 12

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Unit 1

Nature of ecology and sustainable development

Definition, scope of ecology and sustainable development, geomorphology, oceanography, climatology and biogeography.

Unit 2

Energy and environment

Introduction of energy environment, use of solar cells for heating and operated drills, methane gas digesters, environmentally friendly method of energy conservation, difference between conventional and non-conventional energy sources, future trends of energy systems.

Unit 3

Theory of isostasy

Concept of isostasy for sustainable development, discovery of the concept, concept of Hayford and Bowie, Joly, and Holmes, Global isostatic adjustment.

Unit 4

Physical geography and man human impact on the natural environment

Modification of land forms, direct alternation of land forms, wind deflation, coastal erosion and deposition, modification of the atmosphere, ultration process in eco and energy systems.

Unit 5

Obstacles in sustainable development

Pollution growth, species extinction, restriction of bat lands, desertification, soil erosion, soil pollution, characterisation of contaminated soil, global warming and ozone depletion etc.

Name of Text Books:

Energy and environment – Fowler (McGraw Hill, New Delhi)

Restoration Ecology and sustainable development – Krystyna M. Urbanska et.al. (Cambridge University Press, U.K.)

Name of Reference Books:

Reuniting Economy and Ecology in Sustainable Development – Russ Beaton et.al. (-----)

Theory and implementation of economic models for sustainable development – Jeroen C.J.M. Van Den Bergh (-----)

Economy and Ecology: Towards sustainable development – F. Archibugi et.al. (-----)

Evaluating Sustainable Development: Giving People a voice in their destiny – Okechukwu Ukaga et.al. (-----)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII
Subject: Non Conventional Energy Sources Code : 300898 (19)
Total Theory Periods: 50 Total Tutorial Periods: 00
Total Marks in End Semester Exam: 80 Minimum
number of class tests to be conducted: 02
Note: Internal Choice may be given in any three units.

Unit I

Environmental Aspects of Power Generation, Heat Transfer for Solar Energy, Utilization Flat Plate Collectors: Physical principles of conversion of solar radiation into heat, Thermal losses and efficiency of FPC, Practical considerations for flat plate collectors, Applications of FPC – Water heating and drying .Focusing Type Collectors: Orientation and sun tracking systems, Types of concentrating collectors – Cylindrical parabolic collector, Compound parabolic collector, Thermal performance of focusing collectors, Testing of solar collectors.

Unit II

Solar cooking, solar desalination, solar ponds and solar space heating Solar Industrial process heating and Solar power generation. Solar Green Houses, Solar thermo mechanical power, solar refrigeration & air conditioning and Solar High Temperature Applications Gasifier- Classification, Chemistry, Application, advantages, disadvantages and application.

Unit III

Energy from Biomass: Type of biomass sources, biomass generation, factors affecting biodigestion, classification, advantages and disadvantages of biogas plants, community biogas plants, problems related to biogas plants, utilization of biogas. Energy plantation, methods for obtaining energy from biomass, thermal gasification of biomass.

Unit IV

Chemical Energy Sources: Fuel cells: Design, principle, classification, types, advantages and disadvantages Hydrogen Energy: Properties of hydrogen, methods of hydrogen production, physical and chemical principles, storage, advantages and application

Unit V

Wind Energy: Basic principle, wind energy conversion, wind energy conversion systems, design consideration, performance and application. Alcohol fuels: Overview, feedstock, methods for alcohol production, alcohol as an engine fuel; LPG, CNG Hydrogen and Ethanol as an alternative liquid fuel; engine performance with alcohol fuels. Tidal Energy.

Name of Text Books:

1. John A Duffie & William A Beckman: Solar Energy Thermal processes Wiley Inter science publication
- 2 H P Garg & J Prakash, Solar Energy – Fundamentals and Applications: - Wiley Inter science

Name of Reference Books:

1. G D Rai, Solar Energy Utilization – Khanna publishers.
2. S P Sukhatme, Solar Energy – Principles of thermal Collection & Storage – Tata McGraw Hill Publishing company ltd., New Delhi

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII
Subject: Energy Auditing
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: **Common to All Branches**
Code: 300899 (24)
Total Tut Periods: Nil

UNIT I:

History of Energy Management: Energy forecasting, Limitations of energy resources. Renewable energy resources. Load management. Energy management. Demand side management (DSM) Energy conservation in realistic distribution system. Short term load forecasting for de-centralized load management.

UNIT II:

Energy Situation and Global Energy Sources: World energy consumption. Energy in developing countries. Firewood crises. Indian energy sources. Non-conventional renewable energy sources. Potential of renewable energy sources. Solar energy types. Wind energy. Wave, tidal and OTEC. Super-conductors in power system. Wind power generation for large scale generation of electricity. Wind driven induction generators.

UNIT III:

Energy Auditing as Applicable to an Industry: Classification of energy audit System optimization. Power factor improvement. Preventive maintenance. Process modification. Non-conventional energy sources. Electricity tariffs. Types of off-peak tariffs.

UNIT IV:

Elements of Energy Auditing and Metering Methodologies(Case Studies): Capacity utilization. Technology up-gradation. Fine tuning, Energy conservation. Concept and methods of energy conservation.

UNIT V:

Demand Side Management: Introduction to DSM. Concept of DSM. Benefits from DSM. DSM techniques. Time of day pricing, Multi-utility exchange model. Time of day pricing models for planning, load management. Load priority technique. Peak clipping. Peak shifting. Valley filling. Strategic conservation. Energy efficient equipment, Socioeconomic awareness programs.

Text Books:

1. Ashok.V.Desai(ED)-Energy Demand: Analysis, Management and Conservation, Wiley Eastern Ltd., New Delhi.
2. S. Rao, Parulekar, Energy technology, Khanna Pbs.

Reference Books:

1. Jyothi Prakash- Demand Side Management, Tata McGraw-Hill Publishers.
2. N.K.Bansal, Kleeman Millin-Renewable Energy Sources and Conservation Technology, Tata McGraw-Hill Publishers.