



**VEL TECH MULTI TECH
Dr RANGARAJAN Dr.SAKUNTHALA
ENGINEERING COLLEGE**

(An ISO 9001: 2008 Certified Institution)

(Owned by Vel Trust)

(Approved by Govt. of Tamil Nadu and affiliated to Anna University)



SYLLABUS

WEEKLY SCHEDULE

III SEMESTER

2015 - 2016

DEPARTMENT OF CIVIL ENGINEERING

IV YEAR DEGREE COURSE

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WEEK DETAILS

SL.NO.	WEEK	FROM	TO
1	WEEK1	24.06.2015	26.06.2015
2	WEEK2	29.06.2015	03.07.2015
3	WEEK3	06.07.2015	10.07.2015
4	WEEK4	13.07.2015	17.07.2015
5	WEEK5	20.07.2015	24.07.2015
6	WEEK6	27.07.2015	28.07.2015
7	WEEK7	03.08.2015	07.08.2015
8	WEEK8	10.08.2015	14.08.2015
9	WEEK9	17.08.2015	21.08.2015
10	WEEK10	24.08.2015	28.08.2015
11	WEEK11	31.08.2015	04.09.2015
12	WEEK12	07.09.2015	11.09.2015
13	WEEK13	14.09.2015	18.09.2015
14	WEEK14	21.09.2015	25.09.2015
15	WEEK15	28.09.2015	30.09.2015
16	WEEK16	05.10.2015	09.10.2015
17	WEEK17	12.10.2015	16.10.2015
18	WEEK18	19.10.2015	20.10.2015
19	WEEK19	27.10.2015	30.10.2015

SUBJECT CONTENTS

SL.NO	SUBJECT CODE	SUBJECT NAME
THEORY		
1	MA6351	Transforms and Partial Differential Equations
2	GE6351	Environmental Science and Engineering
3	CE6301	Engineering Geology
4	CE6302	Mechanics of Solids
5	CE6303	Mechanics of Fluids
6	CE6304	Surveying I
PRACTICAL		
7	CE6311	Survey Practical I
8	CE6312	Computer Aided Building Drawing

TEST / EXAM SCHEDULE

SL.NO	SUBJECT CODE	SUBJECT NAME	UNIT TEST I	UNIT TEST II	Pre Model Exam	UNIT TEST IV
1	MA6351	Transforms and Partial Differential Equations	13.07.2015	03.08.2015	21.08.2015	14.09.2015
2	GE6351	Environmental Science and Engineering	14.07.2015	04.08.2015	22.08.2015	15.09.2015
3	CE6301	Engineering Geology	15.07.2015	05.08.2015	24.08.2015	16.09.2015
4	CE6302	Mechanics of Solids	16.07.2015	06.08.2015	25.08.2015	18.09.2015
5	CE6303	Mechanics of Fluids	17.07.2015	07.08.2015	26.08.2015	21.09.2015
6	CE6304	Surveying I	20.07.2015	10.08.2015	27.08.2015	22.09.2015

SL.NO	SUBJECT CODE	SUBJECT NAME	MODEL EXAM
1	MA6351	Transforms and Partial Differential Equations	05.10.2015
2	GE6351	Environmental Science and Engineering	06.10.2015
3	CE6301	Engineering Geology	07.10.2015
4	CE6302	Mechanics of Solids	08.10.2015
5	CE6303	Mechanics of Fluids	09.10.2015
6	CE6304	Surveying I	12.10.2015

MA6351 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

WEEK 1

UNIT I PARTIAL DIFFERENTIAL EQUATIONS

Formation of partial differential equations – Singular integrals --
Solutions of standard types of first order partial differential equations

WEEK 2

Lagrange's linear equation -- Linear partial differential equations of second and higher order with constant coefficients of both homogeneous

WEEK 3

Non-homogeneous types

WEEK 4 UNIT TEST I

UNIT II FOURIER SERIES

Dirichlet's conditions – General Fourier series – Odd and even functions
– Half range sine series

WEEK 5

Half range cosine series – Complex form of Fourier series

WEEK 6

Parseval's identity – Harmonic analysis

WEEK 7 UNIT TEST II

WEEK 8

UNIT III APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Classification of PDE – Method of separation of variables - Solutions of one dimensional wave Equation

WEEK 9

One dimensional equation of heat conduction – Steady state solution of two dimensional

Equation of heat conduction (excluding insulated edges)

WEEK 10 UNIT TEST II

UNIT IV FOURIER TRANSFORMS

Statement of Fourier integral theorem – Fourier transforms pair –
Fourier sine

WEEK 11

Cosine transforms – Properties

WEEK 12

Transforms of simple functions – Convolution theorem – Parseval's identity

WEEK 13 UNIT TEST IV**WEEK 14****UNIT V Z - TRANSFORMS AND DIFFERENCE EQUATIONS**

Z- transforms - Elementary properties – Inverse Z - transform (using partial fraction and residues)

WEEK 15

Convolution theorem - Formation of difference equations

WEEK-16

Solution of difference equations using Z – transform

WEEK-17- UNIT TEST V**WEEK-18- MODEL EXAM****TEXT BOOKS:**

1. Veerarajan. T., "Transforms and Partial Differential Equations", Tata McGraw Hill Education Pvt.Ltd., New Delhi, Second reprint, 2012.
2. Grewal. B.S., "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi, 2012.
3. Narayanan.S, Manicavachagom Pillay.T.K and Ramanaiah.G "Advanced Mathematics for Engineering Students" Vol. II & III, S.Viswanathan Publishers Pvt Ltd.1998.

REFERENCES:

1. Bali.N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 7th Edition, Laxmi Publications Pvt Ltd , 2007.
2. Ramana.B.V., "Higher Engineering Mathematics", Tata McGrawHill Publishing Company Limited, New Delhi, 2008.
3. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2007.
4. Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, Wiley India, 2007.
5. Ray Wylie. C and Barrett.L.C, "Advanced Engineering Mathematics" Tata Mc Graw Hill Education Pvt Ltd, Sixth Edition, New Delhi, 2012.

6. Datta.K.B., "Mathematical Methods of Science and Engineering",
Cengage Learning India Pvt Ltd, Delhi, 2013

GE6351 ENVIRONMENTAL SCIENCE AND ENGINEERING

WEEK 1

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

Definition, scope and importance of Risk and hazards; Chemical hazards, Physical hazards, Biological hazards in the environment – concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers- Oxygen cycle and Nitrogen cycle – energy flow in the ecosystem – ecological succession processes – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

WEEK 2

Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity

WEEK 3

Habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds Field study of simple ecosystems – pond, river, hill slopes, etc

WEEK 4 UNIT TEST I

UNIT II - ENVIRONMENTAL POLLUTION

Definition – causes, effects and control measures of: (a) Air pollution (Atmospheric chemistry- Chemical composition of the atmosphere; Chemical and photochemical reactions in the 30 atmosphere - formation of smog, PAN, acid rain, oxygen and ozone chemistry;- Mitigation procedures- Control of particulate and gaseous emission, Control of SO₂, NO_X, CO and HC) (b) Water pollution

WEEK 5

Physical and chemical properties of terrestrial and marine water and their environmental significance; Water quality parameters – physical, chemical and biological; absorption of heavy metals

WEEK 6

Water treatment processes. (c) Soil pollution - soil waste management: causes, effects and control measures of municipal solid wastes – (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards–role of an individual in prevention of pollution – pollution case studies – Field study of local polluted site – Urban / Rural / Industrial / Agricultural

WEEK 7 UNIT TEST II

WEEK 8

UNIT III - NATURAL RESOURCES

Forest resources: Use and over-exploitation, deforestation, case studies-timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and overutilization of surface and ground water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Energy Conversion processes

WEEK 9

Biogas – production and uses, anaerobic digestion; case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles. Introduction to Environmental Biochemistry: Proteins –Biochemical degradation of pollutants, Bioconversion of pollutants. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain

WEEK 10 UNIT TEST III

UNIT IV - SOCIAL ISSUES AND THE ENVIRONMENT

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions

WEEK 11

12 Principles of green chemistry- nuclear accidents and holocaust, case studies. – Wasteland reclamation – consumerism and waste products – environment production act – Air act – Water act – Wildlife protection act – Forest conservation act

WEEK 12

The Biomedical Waste (Management and Handling) Rules; 1998 and amendments- scheme of labeling of environmentally friendly products (Ecomark). enforcement machinery involved in environmental legislation- central and state pollution control boards- disaster management: floods, earthquake, cyclone and landslides. Public awareness

WEEK 13 UNIT TEST IV

WEEK 14

UNIT V - HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education

WEEK 15

HIV / AIDS – women and child welfare –Environmental impact analysis (EIA)

WEEK-16 GIS-remote sensing-role of information technology in environment and human health – Case studies

WEEK-17- UNIT TEST V

WEEK-18- MODEL EXAM

TEXT BOOKS:

1. Gilbert M.Masters, „Introduction to Environmental Engineering and Science“, 2nd edition, Pearson Education, 2004 31
2. Benny Joseph, „Environmental Science and Engineering“, Tata McGraw Hill, New Delhi, 2006.

REFERENCES:

1. Trivedi R.K. „Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards“, Vol. I and II, Enviro Media.
2. Cunningham W.P.Cooper., T.H. Gorhani, „Environmental Encyclopedia“, Jaico Publishing House, Mumbai, 2001.
3. Dharmendra S. Sengar, „Environmental law“, Prentice hall of India PVT LTD, New Delhi, 2007.
4. Rajagopalan R, „Environmental Studies - From Crisis to Cure“, Oxford University Press, 2005

CE6301 ENGINEERING GEOLOGY

WEEK 1

UNIT I PHYSICAL GEOLOGY

Geology in civil engineering – branches of geology – structure of earth and its composition – weathering of rocks – scale of weathering

WEEK 2

Soils - landforms and processes associated with river, wind, groundwater and sea – relevance to civil engineering. Plate tectonics

WEEK 3

Earth quakes – Seismic zones in India

WEEK 4 UNIT TEST I

UNIT II MINEROLOGY

Physical properties of minerals – Quartz group, Feldspar group, Pyroxene - hypersthene and augite

WEEK 5

Amphibole – hornblende, Mica – muscovite and biotite

WEEK 6

Calcite, Gypsum and Clay minerals

WEEK 7 UNIT TEST II

WEEK 8

UNIT III PETROLOGY

Classification of rocks, distinction between Igneous, Sedimentary and Metamorphic rocks. Engineering properties of rocks. Description, occurrence, engineering properties, distribution and uses of Granite

WEEK 9

Dolerite, Basalt, Sandstone, Limestone, Laterite, Shale, Quartzite, Marble, Slate, Gneiss and Schist

WEEK 10 UNIT TEST III

UNIT IV STRUCTURAL GEOLOGY AND GEOPHYSICAL METHODS

Geological maps – attitude of beds, study of structures – folds, faults and joints – relevance to civil engineering

WEEK 11

Geophysical methods

WEEK 12

Seismic and electrical methods for subsurface investigations

WEEK 13 UNIT TEST IV

WEEK14

UNIT V APPLICATION OF GEOLOGICAL INVESTIGATIONS

Remote sensing for civil engineering applications; Geological conditions necessary for design and construction of Dams, Reservoirs

WEEK 15

Tunnels, and Road cuttings,

WEEK-16

Hydrogeological investigations and mining - Coastal protection structures. Investigation of Landslides, causes and mitigation

WEEK-17- UNIT TEST V

WEEK-18- MODEL EXAM

TEXT BOOKS:

1. Varghese, P.C., Engineering Geology for Civil Engineering Prentice Hall of India Learning Private Limited, New Delhi, 2012.
2. Venkat Reddy. D. Engineering Geology, Vikas Publishing House Pvt. Lt, 2010.

3. Gokhale KVGK, "Principles of Engineering Geology", B.S. Publications, Hyderabad 2011.
4. Chenna Kesavulu N. "Textbook of Engineering Geology", Macmillan India Ltd., 2009.
5. Parbin Singh. A "Text book of Engineering and General Geology", Katson publishing house, Ludhiana 2009.

REFERENCES:

1. Muthiayya, V.D. "A Text of Geology", Oxford IBH Publications, Calcutta, 1969
2. Blyth F.G.H. and de Freitas M.H., Geology for Engineers, Edward Arnold, London, 2010.
3. Bell .F.G.. "Fundamentals of Engineering Geology", B.S. Publications. Hyderabad 2011.
4. Dobrin, M.B "An introduction to geophysical prospecting", McGraw Hill, New Delhi, 1988

CE6302 MECHANICS OF SOLIDS

WEEK 1

UNIT I STRESS AND STRAIN

Stress and strain at a point – Tension, Compression, Shear Stress – Hooke’s Law – Relationship among elastic constants

WEEK 2

Stress Strain Diagram for Mild Steel, TOR steel, Concrete – Ultimate Stress – Yield Stress – Factor of Safety – Thermal Stresses

WEEK 3

Thin Cylinders and Shells – Strain Energy due to Axial Force – Resilience – Stresses due to impact and Suddenly Applied Load – Compound Bars

WEEK 4 UNIT TEST I

UNIT II SHEAR AND BENDING IN BEAMS

Beams and Bending- Types of loads, supports – Shear Force and Bending Moment Diagrams for statically determinate beam with concentrated load

WEEK 5

UDL, uniformly varying load. Theory of Simple Bending – Analysis of Beams for Stresses

WEEK 6

Stress Distribution at a cross Section due to bending moment and shear force for Cantilever, simply supported and overhanging beams with different.

WEEK 7 UNIT TEST II

WEEK 8

UNIT III DEFLECTION

Double integration method - Macaulay's methods

WEEK 9

Area moment method - conjugate beam method for computation of slopes and deflections of determinant beams.

WEEK 10 UNIT TEST III

UNIT IV DEFLECTION OF BEAMS AND SHEAR STRESSES

Torsion of Circular and Hollow Shafts – Elastic Theory of Torsion – Stresses and Deflection in Circular Solid and Hollow Shafts

WEEK 11

Combined bending moment and torsion of shafts - strain energy due to torsion - Modulus of Rupture – Power transmitted to shaft,

WEEK 12

Shaft in series and parallel – Closed and Open Coiled helical springs – Leaf Springs – Springs in series and parallel – Design of buffer springs

WEEK 13 UNIT TEST IV

WEEK14

UNIT V COMPLEX STRESSES AND PLANE TRUSSES

2 D State of Stress – 2 D Normal and Shear Stresses on any plane

WEEK 15

Principal Stresses and Principal Planes – Mohr's circle

WEEK-16

Plane trusses: Analysis of plane trusses - method of joints - method of sections

WEEK-17- UNIT TEST V

WEEK-18- MODEL EXAM

TEXT BOOKS:

1. Rajput.R.K. "Strength of Materials", S.Chand and Co, New Delhi, 2007.
2. Bhavikatti. S., "Solid Mechanics", Vikas publishing house Pvt. Ltd, New Delhi, 2010.

REFERENCES :

1. Gambhir. M.L., "Fundamentals of Solid Mechanics", PHI Learning Private Limited., New Delhi, 2009.
2. Timoshenko.S.B. and Gere.J.M, "Mechanics of Materials", Van Nos Reinhold, New Delhi 1995.
3. Vazirani.V.N and Ratwani.M.M, "Analysis of Structures", Vol I Khanna Publishers, New Delhi,1995.
4. Junnarkar.S.B. and Shah.H.J, "Mechanics of Structures", Vol I, Charotar Publishing House, New Delhi 1997.
5. Ugural. A.C., "Mechanics of Materials", Wiley India Pvt. Ltd., New Delhi, 2013

CE6303 MECHANICS OF FLUIDS

WEEK 1

UNIT I FLUID PROPERTIES AND FLUID STATICS

Fluid – definition, distinction between solid and fluid - Units and dimensions - Properties of fluids - density, specific weight, specific volume, specific gravity, temperature, viscosity

WEEK 2

Compressibility, vapour pressure, capillarity and surface tension

WEEK 3

Fluid statics: concept of fluid static pressure, absolute and gauge pressures - pressure measurements by manometers and pressure gauges - forces on planes – centre of pressure – buoyancy and floatation

WEEK 4 UNIT TEST I

UNIT II FLUID KINEMATICS AND DYNAMICS

WEEK 5

Fluid Kinematics - Flow visualization - lines of flow - types of flow - velocity field and acceleration - continuity equation (one and three

dimensional differential forms)- Equation of streamline - stream function - velocity potential function - circulation - flow net

WEEK 6

Fluid dynamics - equations of motion - Euler's equation along a streamline - Bernoulli's equation – applications - Venturi meter, Orifice meter and Pitot tube. Linear momentum equation and its application

WEEK 7 UNIT TEST II

WEEK 8

UNIT III FLOW THROUGH PIPES

Viscous flow - Shear stress, pressure gradient relationship - laminar flow between parallel plates - Laminar flow through circular tubes (Hagen poiseuille's)

WEEK 9

Hydraulic and energy gradient - flow through pipes - Darcy -Weisbach's equation - pipe roughness -friction factor- Moody's diagram- Major and minor losses of flow in pipes - Pipes in series and in parallel

WEEK 10 UNIT TEST III

UNIT IV BOUNDARY LAYER

Boundary layer – definition- boundary layer on a flat plate

WEEK 11

Thickness and classification – displacement , energy and momentum thickness

WEEK 12

Boundary layer separation and control – drag in flat plate – drag and lift coefficients

WEEK 13 UNIT TEST IV

WEEK 14

UNIT V DIMENSIONAL ANALYSIS AND MODEL STUDIES

Fundamental dimensions - dimensional homogeneity

WEEK 15

Rayleigh's method and Buckingham

WEEK-16

Pi-Theorem - Dimensionless parameters - Similitude and model studies - Distorted Models

WEEK-17- UNIT TEST V

WEEK-18- MODEL EXAM

TEXT BOOKS:

1. Modi P.N and Seth "Hydraulics and Fluid Mechanics including Hydraulic Machines", Standard Book House New Delhi. 2003
2. Ramamirtham, S., "Fluid Mechanics and Hydraulics and Fluid Machines", Dhanpat Rai and Sons, Delhi, 2001.
3. Bansal, R.K., "Fluid Mechanics and Hydraulics Machines", 5th edition, Laxmi Publications Pvt. Ltd, New Delhi, 2008

REFERENCES:

1. Streeter, V.L., and Wylie, E.B., "Fluid Mechanics", McGraw Hill, 2000.
2. Fox W.R. and McDonald A.T., Introduction to Fluid Mechanics John-Wiley and Sons, Singapore, 1995.
3. Jain A. K. "Fluid Mechanics", Khanna Publishers, 2010 \
4. Roberson J.A and Crowe C.T., "Engineering Fluid Mechanics", Jaico Books Mumbai, 2000.
5. White, F.M., "Fluid Mechanics", Tata McGraw Hill, 5th Edition, New Delhi, 2003.

CE6304 SURVEYING I**WEEK 1****UNIT I FUNDAMENTALS AND CHAIN SURVEYING**

Definition- Classifications - Basic principles-Equipment and accessories for ranging and chaining – Methods of ranging - well conditioned triangles

WEEK 2

Errors in linear measurement and their corrections - Obstacles

WEEK 3

Traversing – Plotting – applications- enlarging the reducing the figures – Areas enclosed by straight line irregular figures- digital planimetre

WEEK 4 UNIT TEST I**UNIT II COMPASS AND PLANE TABLE SURVEYING**

Compass – Basic principles - Types - Bearing - Systems and conversions- Sources of errors - Local attraction - Magnetic declination- Dip-Traversing

WEEK 5

Plotting - Adjustment of closing error – applications - Plane table and its accessories

WEEK 6

Merits and demerits - Radiation - Intersection - Resection – Traversing- sources of errors – applications

WEEK 7 UNIT TEST II

WEEK 8

UNIT III LEVELLING

Level line - Horizontal line - Datum - Bench marks -Levels and staves - temporary and permanent adjustments – Methods of levelling - Fly levelling - Check levelling - Procedure in levelling - Booking - Reduction

WEEK 9

Curvature and refraction - Reciprocal levelling – Sources of Errors in levelling- Precise levelling - Types of instruments - Adjustments - Field procedure

WEEK 10 UNIT TEST III

UNIT IV LEVELLING APPLICATIONS

Longitudinal and Cross-section-Plotting - Contouring - Methods - Characteristics and uses of contours

WEEK 11

Plotting – Methods of interpolating contours

WEEK 12

Computations of cross sectional areas and volumes - Earthwork calculations - Capacity of reservoirs - Mass haul diagrams

WEEK 13 UNIT TEST IV

WEEK 14

UNIT V THEODOLITE SURVEYING

Theodolite - Types - Description - Horizontal and vertical angles

WEEK 15

Temporary and permanent adjustments – Heights and distances

WEEK-16

Tangential and Stadia Tacheometry – Subtense method - Stadia constants - Anallactic lens

WEEK-17- UNIT TEST V

WEEK-18- MODEL EXAM

TEXT BOOKS:

1. Chandra A.M., "Plane Surveying", New Age International Publishers, 2002.
2. Alak De, "Plane Surveying", S. Chand & Company Ltd., 2000

REFERENCES:

1. James M. Anderson and Edward M. Mikhail, "Surveying, Theory and Practice", 7th Edition, McGraw Hill, 2001.
2. Bannister and S. Raymond, "Surveying", 7th Edition, Longman 2004.
3. Roy S.K., "Fundamentals of Surveying", 2nd Edition, Prentice Hall of India, 2004.
4. Arora K.R., "Surveying Vol I & II", Standard Book house, 10th Edition 2008

CE6311 SURVEY PRACTICAL I

LIST OF EXPERIMENTS:

1. Study of chains and its accessories
2. Aligning, Ranging and Chaining
3. Chain Traversing
4. Compass Traversing
5. Plane table surveying: Radiation
6. Plane table surveying: Intersection
7. Plane table surveying: Traversing
8. Plane table surveying: Resection – Three point problem
9. Plane table surveying: Resection – Two point problem
10. Study of levels and leveling staff
11. Fly leveling using Dumpy level
12. Fly leveling using tilting level
13. Check leveling
14. LS and CS
15. Contouring

16. Study of Theodolite

CE6312 COMPUTER AIDED BUILDING DRAWING

LIST OF EXPERIMENTS:

1. Principles of planning, orientation and complete joinery details (Paneled and Glazed Doors and Windows)
2. Buildings with load bearing walls
3. Buildings with sloping roof
4. R.C.C. framed structures.
5. Industrial buildings – North light roof structures
6. Building Information Modeling

TEXT BOOKS:

1. Sikka V. B., A Course in Civil Engineering Drawing, 4th Edition, S.K. Kataria and Sons, 1998.
2. George Omura, "Mastering in AUTOCAD 2002", BPB Publications, 2002

REFERENCES:

1. Shah.M.G., Kale. C.M. and Patki. S.Y., "Building Drawing with an Integrated Approach to Built Environment", Tata McGraw Hill Publishers Limited, 2004.
2. Verma.B.P., "Civil Engineering Drawing and House Planning", Khanna Publishers, 1989
