



Rajiv Gandhi Technological University, Bhopal (MP)
B.E. (CE) Civil Engineering
 Revised syllabus and Scheme of Examination effective from July 2007

THIRD SEMESTER

S. No	Course Category	Course Code (New)	Subject	Periods Per Week				Distribution of Marks				
				L	T	P	C	Theory	Practical	Internal Assessment		Total
										MST	TW	
1	BS-5	BE 301	Mathematics III	3	1	0	4	100	-	20	-	120
2	DC 1	CE.302	Transportation Bridges and Tunnels	3	1	0	4	100	-	20	-	120
3	DC-2	CE/FT 303	Strength of Materials	3	1	2	6	100	50	20	30	200
4	DID 1	CE 304	Engineering Geology	3	1	2	6	100	50	20	30	200
5	DC-3	CE/FT 305	Bldg. Design & Drawing	3	1	2	6	100	50	20	30	200
6	IT-2	CE 306	Java	0	0	4	4	-	50	-	50	100
7	NECC-1	CE 307	Self Study	0	0	1	1	-	-	-	30	30
8	NECC-2	CE 308	Seminar/Group Discussion etc.	0	0	1	1	-	-	-	30	30
Total				15	5	12	32	500	200	100	200	1000

BS	Basic Sciences	HS	Humanity Sciences
DC	Department Core	DID	Department Inter Disciplinary
IT	Information Technology subjects	NECC	Non Exam Credit Course
MST	Mid Semester Test	TW	Term Work (Session/ Practical)
C	Credits	L	Lecture Hrs
P	Practical Hrs	T	Tutorial Hrs



Rajiv Gandhi Technological University, Bhopal (MP)
B.E. (CE) Civil Engineering
 Revised syllabus and Scheme of Examination effective from July 2007
FOURTH SEMESTER

S. No	Course Category	Course Code (New)	Subject	Period Per Week				Distribution of Marks				
				L	T	P	C	Theory	Practical	Internal Assessment		Total
										MST	TW	
1.	DC-4	CE 401	Concrete Technology	3	1	0	4	100	-	20	-	120
2.	HS 2	AU/CE/CM/ME/ IP 402	Energy, Environment, Ethics and Society	3	1	0	4	100	-	20	-	120
3.	DC-5	CE 403	Surveying	3	1	2	6	100	50	20	30	200
4.	DC-6	CE 404	Construction Materials and Techniques	3	1	2	6	100	50	20	30	200
5.	DC-7	CE/CM 405	Fluid Mechanics	3	1	2	6	100	50	20	30	200
6.	IT-3	CE 406	Dot.Net	0	0	4	4	-	50	-	50	100
7.	NECC-3	CE 407	Self Study	0	0	1	1	-	-	-	30	30
8.	NECC-4	CE 408	Seminar/Group Discussion etc.	0	0	1	1	-	-	-	30	30
Total				15	5	12	32	500	200	100	200	1000

BS	Basic Sciences	HS	Humanity Sciences
DC	Department Core	DID	Department Inter Disciplinary
IT	Information Technology subjects	NECC	Non Exam Credit Course
MST	Mid Semester Test	TW	Term Work (Session/ Practical)
C	Credits	L	Lecture Hrs
P	Practical Hrs	T	Tutorial Hrs

COURSE CONTENTS

Category	Title	Code	Credits-4C			Theory Papers
Basic Sciences BS-5	Mathematics-III	BE 301	L	T	P	Max Marks-100 Min Marks-35 Duration-3 Hrs
			3	1	0	

Unit 1 Functions of Complex Variables: Analytic functions, Harmonic Conjugate, Cauchy - Riemann Equations, Line integral, Cauchy's theorem, Cauchy's Integral formula, Singular points, Poles and Residues, Residue theorem, Evaluation of Real Integral, Bilinear Transformation.

Unit 2 Numerical Analysis: Difference operators, Errors and Approximations, Interpolation, Inverse interpolation, Numerical differentiation, Numerical Integration by using Simpson's method, Weddel's rule and Gauss legendre open quadrate formula.

Unit 3 Solutions of algebraic and transcendental equations(Regular False, Newton-Raphson, Iterative, Graffe's root squaring methods), Solutions of simultaneous algebraic equations, Solutions of ordinary differential equations (Tailor's Series, Picard's Method, Modified Euler's method, Runge Kutta Method, Predictor-Corrector Method), Solution of Partial differential equation.

Unit 4 Introduction to optimization by linear programming, only two variable problems solution by graphical and simplex method, concept of degeneracy and duality; simple three variable transport and assignment problems and modeling into LPP.

Unit 5 introduction to Q theory and Markovian process, time independent property of exponential distribution, solution of only M/M/1 (∞/∞ /FCFS) Queues; introduction to design of experiments, factorial design, sampling methods, Taguchi Loss Function, robust design methods, variance reduction and six (± 3) σ outliers in quality.

References:

1. Kreyszig E; Advanced Engineering Mathematics; Wiley Eastern Limited.
2. Ramana BV; Higher Engineering Mathematics; TMH
3. Grewal BS; Higher Engineering Mathematics; Khanna Publisher.
4. Taha H; Operations Research an Introduction; PHI
5. Ross; Taguchi techniques for Quality engineering, TMH
6. Spiegel; Theory and problems of probability and statistics; TMH
7. Chandrasekharaiah DS; Engineering Maths Part II & III; Prism Books Pvt.
8. Johnson; Miller and Freund's Probability and statistics for Engineers; PHI.
9. Jaggi, Mathur; Engineering Mathematics; Khanna Publisher.

Course Contents

Category	Title	Code	Credits -4			Theory Papers
CE Department DC-1	Transportation Bridges and Tunnels	CE 302	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

Unit I Introduction, Tractive resistances & Permanent way: Principles of Transportation, transportation by Roads, railways, Airways, Waterways, their importance and limitations, Route surveys and alignment, railway track, development and gauges, Hauling capacity and tractive effort.

i) Rails: types, welding of rails, wear and tear of rails, rail creep.

ii) Sleepers: types and comparison, requirement of a good sleeper, sleeper density.

iii) Rail fastenings: types, Fish plates, fish bolts, spikes, bearing plates, chain keys, check and guard rails.

iv) Ballast: Requirement of good ballast, various materials used as ballast, quantity of ballast, different methods of plate laying, material trains, calculation of materials required, relaying of track

Unit II Geometric Design; Station & Yards; Points and Crossings & Signaling and interlocking: Formation, cross sections, Super elevation, Equilibrium, Cant and Cant deficiency, various curves, speed on curves. Types, locations, general equipments, layouts, marshalling yards, Definition, layout details, design of simple turnouts, Types of signals in stations and yards, principles of signaling and inter-locking.

Unit-III Bridge Site Investigation and Planning; Loading Standards & Component parts: Selection of site, alignment, collection of bridge design data: essential surveys, hydraulic design, scour, depth of bridge foundation, Economical span, clearance, afflux, type of road & railway bridges. : Design loads and forces, Impact factor, Indian loading standards for Railways Bridges and Highway Bridges, Bridge super structure and sub-structures, abutments, piers, wing walls, return walls, approaches, floors & flooring system, choice of super structure.

Unit-IV Bridge Foundations, Construction, Testing and Strengthening of Bridges : Different types of foundation: piles and wells, sinking of wells, coffer-dams. Choice of bridges and choice of materials, details of construction underwater and above water, sheet piles coffer dams, Erection of bridges, girders, equipments and plants. inspection and Data collection, strengthening of bridges, Bridge failure.

Unit-V Tunnels: 1. Selection of route, Engineering surveys, alignment, shape and size of tunnel, bridge action, pressure relief phenomenon, Tunnel approaches, Shafts, pilot shafts 2, Construction of tunnels in soft soil, hard soil and rock, Different types of lining, methods of lining, Mucking operation, Drainage and ventilation, Examples of existing important tunnels in India and abroad.

References

1. Chakraborty and Das; Principles of transportation engineering; PHI
2. Rangwala SC; Railway Engineering; Charotar Publication House, Anand
3. Rangwala SC; Bridge Engineering; Charotar Publication House, Anand
4. Ponnuswamy; Bridge Engineering; TMH
5. Railway Engineering by Arora & Saxena - Dhanpat Rai & Sons
6. Railway Track by K.F. Antia
7. Principles and Practice of Bridge Engineering S.P. Bindra - Dhanpat Rai & Sons
8. Bridge Engineering - J.S. Alagia - Charotar Publication House, Anand
9. Railway, Bridges & Tunnels by Dr. S.C. Saxena
10. Harbour, Docks & Tunnel Engineering - R. Srinivasan
11. Essentials of Bridge Engg. By I.J. Victor; Relevant IS & IRS codes

Course Contents

Category	Title	Code	Credits-6C			Theory Papers
			L	T	P	
CE Department DC-2	Strength of Materials	CE/FT 303	3	1	2	Max.Marks-100 Min.Marks-35 Duration-3hrs.

Unit 1 Simple Stress and Strains: Concept of Elastic body, stress and Strain, Hooke's law, various types of stress and strains, Elastic constants, Stresses in compound bars, composite and tapering bars, Temperature stresses. Complex Stress and Strains: Two dimensional and three dimensional stress system. Normal and tangential stresses, Principal Planes, Principal Stresses and strains, Mohr's circle of stresses, Combined Bending and Torsion, Theories of failure.

Unit 2 Bending & Deflection: Theory of simple bending: Concept of pure bending and bending stress, Equation of bending. Neutral axis, Section-Modulus, Determination of bending stresses in simply supported, Cantilever and Overhanging beams subjected to point load and uniformly distributed loading. Bending & shear stress distribution across a section in Beams. Deflection of beams: Double Integration Method. Conjugate Beam Method, Macaulay's Method Area Moment Method.

Unit 3 Torsion of Shafts: Concept of pure torsion, Torsion equation, Determination of shear stress and angle of twist of shafts of circular section, Hollow shafts, Open and closed coil springs, Leaf Spring, Spiral Spring, Pressure Vessels: Thin and Thick walled cylinders and spheres. Stress due to internal pressure, Change in diameter and volume, Compound cylinders and shrink fittings.

Unit 4 Unsymmetrical Bending: Principal moment of Inertia, Product of Inertia, Bending of a beam in a plane which is not a plane of, symmetry. Shear center; Curved beams: Pure bending of curved beams of rectangular, circular and trapezoidal sections, Stress distribution and position of neutral axis.

Unit 5 Columns and Struts: Euler's buckling load for uniform section, various end conditions, slenderness Ratio, Stress in columns, Rankine formulae, Eccentric loading on columns.

Reference

1. Nash; Strength of Materials (Schaum), TMH.
2. Rattan SS; strength of Materials; TMH
3. Negi; Strength of materials; TMH
4. Sadhu Singh; Strength of Materials, ,
5. Ramamrutham; Strength of Materials, ,
6. Subramaniam; Strength of Materials; R; Oxford
7. National Building Code of India, Part-IV

List of Experiments

The experimental work to cover tension, compression, bending and impact test etc. on steel, cast iron, RCC and timber, Fire Resistant Test of Structures and Combustibility of Building Materials Test as per I.S.I. and other experiments based on the syllabus.

Course Contents

Category	Title	Code	Credits-6C			Theory Papers
DID-1	Engineering Geology	CE 304	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	2	

Unit 1 Introduction and Physical Geology: Objects and scope of geology. The crust and the interior of the earth, origin and age of the earth, Sub-aerial and sub-terrain weathering, denudation and deposition, wind, river, glacial and marine erosion, volcanoes , soil formation, soil profile, geological classification of soil and concept of earthquake Plate- tectonics.

Unit 2 Mineralogy and Crystallography: Fundamentals of mineralogy, study of common rock forming minerals, ores and minerals of economic importance to civil engineering., elements of crystallography and introduction to crystal systems.

Unit 3 (1) Petrology: Composition of earth's crust, study of igneous, sedimentary and metamorphic rocks and their formation, characteristics classification, Rocks of civil engineering importance.

(2) Geology of India: Physical features of India, Brief geological history of India, occurrence of important ores and minerals in India.

Unit 4 Structural Geology: Structures related to rocks, Dip, Strike and outcrops, Classification and detailed studies of geological structures i.e. folds, Faults, Joints, Unconformity and their importance in Civil Engineering.

Unit 5 Applied Geology: Introduction to applied geology and its use in civil engg., properties of rocks, selection of sites for roads, bridges, dams, reservoirs and tunnels. Prevention of engineering structures from seismic shocks, stability of hill sides, water bearing strata, artesian wells, Use of remote-sensing techniques in selection of above sites.

Reference:

1. Prabin Singh – “Engineering and General Geology”
2. Gulati ; Geotechnical Engineering; TMH
3. P.K. Mukerjee – “ A text Book of Geology”
4. S.K. Garg – “ A text Book of Physical and Engineering Geology”

List of Experiment (Expandable)

1. Identification of simple rock forming minerals and important ores.
2. Identification of rock
3. Simple map Exercises.
4. Field Visit / Geological Excursion

Course Contents

Category	Title	Code	Credits-6C			Theory Papers
CE Department DC 3	Building Design and Drawing	CE/FT 305	L 3	T 1	P 2	Max.Marks-100 Min.Marks-35 Duration-3hrs.

Unit 1 Drawing of Building Elements – Drawing of various elements of buildings like various types of footing, open foundation, raft, grillage, pile and well foundation, Drawing of frames of doors, window, various types of door, window and ventilator, lintels and arches, stairs and staircase, trusses, flooring, roofs etc.

Unit 2 Building Planning – Provisions of National Building Code, Building bye-laws, open area, set backs, FAR terminology, principle of architectural composition (i.e. unity, contrast, etc.), principles of planning, orientation.

Unit 3 Building Services – Introduction of Building Services like water supply and drainage, electrification, ventilation and lightening and staircases, fire safety, thermal insulation, acoustics of buildings.

Unit 4 Design and Drawing of Building – Design and preparation of detailed drawings of various types of buildings like residential building, institutional buildings and commercial buildings, detailing of doors, windows, ventilators and staircases etc.

Unit 5 Perspective Drawing – Elements of perspective drawing involving simple problems, one point and two point perspectives, energy efficient buildings.

References

1. Malik & Meo; Building Design and Drawing By
2. Shah, Kale & Patki; Building Design and Drawing; TMH
3. Gurucharan Singh & Jgdish Singh Building Planning, Design and Scheduling

List of Experiments (Expandable)

1. Sketches of various building components.
2. One drawing sheet of various building components containing doors, windows ventilators, lintels and arches stairs foundations etc.
3. One drawing sheet each for services and interiors of buildings.
4. One drawing sheet containing detailed planning of one/two bed room residential building (common to all student)
5. One drawing sheet each of residential and institutional building (Each student perform different drawing).
6. Use of AutoCAD for preparation of drawings.

Course Contents

Category	Title	Code	Credits-4C			Practical
			L	T	P	
IT-2	JAVA	CS/CE 306	0	0	4	Max. Marks-50 Min. Marks-25 Duration-

UNIT-I Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT-II Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector. Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT-III Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT-IV Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT-V Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:

1. Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
2. E. Balaguruswamy, "Programming In Java"; TMH Publications
3. The Complete Reference: Herbert Schildt, TMH
4. Peter Norton, "Peter Norton Guide To Java Programming", Techmedia.
5. Merlin Hughes, et al; [Java Network Programming](#) , Manning Publications/Prentice Hall

List of Program to be perform (Expandable)

1. Installation of J2SDK
2. Write a program to show Concept of CLASS in JAVA
3. Write a program to show Type Casting in JAVA
4. Write a program to show How Exception Handling is in JAVA
5. Write a Program to show Inheritance
6. Write a program to show Polymorphism
7. Write a program to show Interfacing between two classes
8. Write a program to Add a Class to a Package
9. Write a program to demonstrate AWT.
10. Write a program to Hide a Class
11. Write a Program to show Data Base Connectivity Using JAVA
12. Write a Program to show "HELLO JAVA " in Explorer using Applet
13. Write a Program to show Connectivity using JDBC
14. Write a program to demonstrate multithreading using Java.
15. Write a program to demonstrate applet life cycle.

Course Contents

Category	Title	Code	Credits 4			Theory Paper
Civil Engineering Department DC-3	Concrete Technology	CE 401	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1		

Unit I

Introduction Classification, properties, grades, advantage & disadvantages of concrete, Ingredients of concrete, types of cement, aggregates, water, admixtures, Inspection & testing of materials as per Indian Standard Specifications.

Unit II

Properties of Fresh and Hardened Concrete : Introduction, Workability, Testing of concrete, Factors affecting, Rheology of concrete, Compressive & Tensile strength, Stress and strain characteristics, Shrinkage and temperature effects. Creep of concrete, Permeability, durability, thermal properties & micro-cracking of concrete.

Unit III

Design of Concrete Mix : Various classical methods of concrete mix design, I.S. code method, basic considerations and factors influencing the choice of mix design, acceptance criteria for concrete, concrete mixes with Surkhi and other Pozzolanic materials, design of plastic concrete mix, computer aided design of concrete mix.

Unit IV

Production and Quality Control of Concrete : Production of crushed stone aggregate, batching equipments for production and concreting, curing at different temperatures, Concreting underwater, hot & cold weather condition, statistical quality control, field control, non-destructive testing, repair technology for concrete structures, Inspection & Testing of Concrete.

Unit V

Special Concretes : Light weight concrete, Ready mix concrete, Vacuum concrete, Ferrocement, Fiber reinforced concrete, Polymer concrete composites, Shotcrete, Guniting, Rubble concrete, Resin concrete, Prestressed concrete, Heat resistant concrete, Mass concrete, Temperature control of mass concrete.

References:

1. Varshney RS; Concrete Technology; Oxford & IBH publishing co.
2. Gambhir ML; Concrete Technology – TMH
3. Sinha SN; Reinforced Concrete Technology; TMH
4. New Building Materials Published by B.M.T.P.C., New Delhi
5. Hand books on Materials & Technology - Published by BMTPC & HUDCO
6. Mohan Rai & M.P. Jai Singh; Advances in Building Materials & Construction
7. Jackson N; Civil Engineering materials.
8. Properties of Concrete - A.M. Neville - Pearson Education

COURSE CONTENTS

Category	Title	Code	Credits-4C			Theory Papers
			L	T	P	
Humanities and Science HS 2	Energy Environment Ethics and Society	AU/CE/CM/FT/IP/ ME/TX 402	3	1	0	Max Mark-100 Min Mark-35 Duration-3Hrs

Unit 1 Energy: linkage with development, world energy scenario, fossil fuel resource- estimates and duration, India's energy scenario; Finite/ depleting energy resources, coal, oil, gas, nuclear fission, promises and present status of nuclear fusion energy; Renewable energy, solar, hydro, wind, biomass, ocean, tidal, wave and geothermal. Synergy between energy and environment, global environment issues, greenhouse gas emission, global warming, green energy solutions.

Unit 2 Society and environment: exponential growth in population, environmentally optimum sustainable population, free access resources and the tragedy of commons; environment problems and impact of P.A.T (Population, Affluence and Technology), environmentally beneficial and harmful technologies; environment impact assessment policies and auditing interaction between environment, life support systems and socio-culture system.

Unit 3 Ecosystem: definition, concepts, structure, realm of ecology, lithosphere, hydrosphere, biosphere, atmosphere-troposphere-stratosphere; energy balance to earth, matter and nutrient recycling in ecosystems; nitrogen, oxygen, carbon and water cycles, food producers, consumers and decomposers, food chains; biodiversity, threat and conservation of biodiversity. Worldviews and environmentally sustainable economic growth, introduction to Design For Environment (DFE), product lifecycle assessment for environment and ISO 14000; triple bottom-line of economic, environment and social performance; environmental ethics, its world impact and challenges.

Unit 4 (a) Air pollution-primary, secondary; chemical and photochemical reactions, effects of CO, NO, CH and particulates, acid rain, Ozone depletion; monitoring and control of pollutants
(b) Noise pollution-sources and control measures.
(c) Water pollution, analysis and management, heavy metals- and nuclear pollutions; industrial pollution from paper, pharmacy, distillery, tannery, fertilizer, food processing and small scale industries.

Unit 5 Ethics and moral values, ethical situations, objectives of ethics and its study, role morality and conflicts; values, policies and Organization Culture; Non-professional, quasi- and hard-professionals; preventive, personal, common and professional ethics; different ethical value criteria like utilitarian, virtue, right and duty ethics with discussion on the case of priority for improvement of urban (high traffic) or rural (low traffic) intersections causing equal number of fatalities; codes of ethics and their limitations; Institute of engineers code for corporate member, IEEE and ACM professional-code.

References:

1. Miller G. T Jr; Living in the environment; Cengage Publisher.
2. Cunningham W; Principles of Environmental Science: TMH
3. Harris CE, Prichard MS, Rabins MJ, Engineering Ethics; Cengage Pub.
4. Martin; Ethics in Engineering; TMH
5. Govindrajan, Natrajan, Santikumar; Engineering Ethics; PHI pub.
6. Rana SVS;Essentials of ecology and environment; PHI Pub.
7. Gerard Kiely, Environmental Engineering; TMH
8. Khan BH; Non Conventional energy resources; TMH Pub.
9. Raynold G.W. "Ethics in Information Technology; Cengage

Course Contents

Category	Title	Code	Credits -6			Theory Papers
CE Department DC-5	Surveying	CE 403	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	2	

Unit-I Traversing by theodolite, Field work checks, traverse computations, latitude and departures, adjustments, computations of co-ordinates, plotting & adjusting or traverse, Omitted measurements, Measurement EDM, Trigonometrical leveling.

Unit-II Tachometry: Tachometric systems and principles, stadia system, uses of anallatic lens, tangential system, sublense system, instrument constant, field work reduction, direct-reading tachometers, use of tachometry for traversing and contouring.

Unit-III Curves: Classification and use; elements of circular curves, calculations, setting out curves by offsets and by theodolites, compound curves, reverse curves, transition curves, cubic spiral and lemniscate, vertical curves, setting out.

Unit-IV Control Surveys: Providing frame work of control points, triangulation principle, co naissance, selection and marking of stations, angle measurements and corrections, baseline measurement and corrections, computation of sides, precise traversing.

Unit-V Hydrographic Surveying: Soundings, methods of observations, computations and plotting. Principles of photographic surveying: aerial photography, tilt and height distortions, Remote sensing, simple equipments, elements of image interpretation, image-processing systems.

Reference

1. T.P. Kanetkar, Surveying & Levelling, Vol. I & II.
2. Duggal; Surveying vol I and II; TMH
3. Basak; Surveying and Leveling; TMH
4. R.E.Devis, Surveying theory & Practice, Mc.Graw Hill, New York
5. David Clark & J Clendinning, Plane & Geodetic surveying Vol. I & II, constable & Co. London.
6. S.K. Roy, Fundamentals of surveying, prentice - Hall of India New Delhi
7. B.C. Punmia, Surveying Vol. I, II, III, Laxmi Publications New Delhi
8. K.R. Arora, Surveying Vol. I & II, standard book House, New Delhi

List of Experiments/ Field work (Expandable):

1. Theodolite traversing
2. Profile leveling, contouring & cross sectioning
3. Determination of tachometric constants & uses of tachometer in various field works
4. Curve setting by different methods.

Course Contents

Category	Title	Code	Credits-6C			Theory Papers
DC-6	Construction Materials and Techniques	CE 404	L	T	P	Max Marks-100 Min Marka-35 Duration-3Hrs
			3	1	2	

A) Construction Materials:

Unit-I Stones : Occurrence, varieties, Characteristics and their testing, uses, quarrying and dressing of stones. Timber : Important timbers, their engineering properties and uses, defects in timber, seasoning and treatment, need for wood substitutes, Alternate materials for shuttering doors/windows, Partitions and structural members etc. Brick and Tiles: Manufacturing , characteristics, Classification and uses, Improved brick from inferior soils, Hand molding brick table, Clay-fly ash brick table, Flooring tiles and other tiles and their characteristics.

Unit-II Advance Construction Materials : Use of fly ash in mortars, concrete, Fly ash bricks, stabilized mud blocks, non-erodible mud plinth, D.P.C. materials, Building materials made by Industrial & agricultural waste, clay products P.V.C. materials, advance materials for flooring, doors & windows, facia material, interiors materials for plumbing, sanitation & electrification.

(B) Construction Techniques:

Unit-III Foundation: Type of soils, bearing capacity, soil slablisation and improvement of bearing capacity, settlement and safe limits. Spread foundations, wall footings, grillage, foundations well foundation, causes of failure and remedial measures; under reamed piles, foundation on shrinkable soils, black cotton soil, timbering for trenches, dewatering of foundations. Hyperbolic paraboloid footing, Brick arch foundation. Simple methods of foundation design, Damp proof courses, Repairs Techniques for foundations.

Unit-IV Masonry and Walls : Brick masonry, Bonds, Jointing, Stone masonry, casting and laying, masonry construction, Brick cavity walls, code provisions regarding load bearing and non load bearing walls. Common defects in construction and their effect on strength and performance of walls, designed Brick masonry, precast stone masonry block, Hollow concrete block, plastering and pointing, white and color washing, distempering, dampness and its protection, Design of hollow block masonry walls. Doors, Windows and Ventilators: Types based on material etc., size location, fittings, construction sunshades, sills and jambs, RCC doors/windows frames. Stairs types, rule of proportionality etc., Repairs techniques for masonry, walls, doors & windows.

Unit-V Floors and Roofs : Types, minimum thickness, construction, floor finishes, Flat roofs, RCC jack arch, reinforced brick concrete, solid slab and timber roofs, pitched roofs, false ceiling, roof coverings, Channel unit, cored unit, Waffle unit, Plank and Joist, Brick panel, L-Panel, Ferro-cement roofing units, water proofing .Services : Water supply & Drainage, Electrification, Fire protection, thermal insulation, Air Conditioning, Acoustics & Sound insulation, Repairs to damaged & cracked buildings, techniques and materials for low cost housing., Repairs techniques for floors & roofs.

References:

1. Mohan Rai & M.P. Jai Singh; Advance in Building Materials & Construction,.
2. S.C. Rangwala; Engineering Materials
3. Sushil Kumar; Building Construction,
4. B.C. Punmia; Building Construction ,.
5. Building Construction, Metchell
6. Construction Technology, Chudley R.
7. Civil Engineering Materials, N. Jackson.
8. Engineering Materials, Surendra Singh.

List of Experiments:

1. Tests on Bricks
2. Tests on Aggregates
3. Tests on Cement
4. Determination of compressive strength of concrete with different cement grades.
5. Determination of workability of concrete by slump test
6. Determination of workability by compacting factor apparatus.
7. Determination of workability by Vee Bee consistometer.
8. Nondestructive testing of concrete by Rebound hammer test
9. Nondestructive testing of concrete by ultrasonic Method.
10. Test for the effect of admixtures on the concrete compressive strength
11. Testing of microconcrete
12. Design of concrete mix.

Course Contents

Category	Title	Code	Credits -6			Theory Papers
CE Department DC-7	Fluid Mechanics	AU/CE/ CM/IP/ ME 405	L	T	P	Max.Marks-100
			3	1	2	Min.Marks-35 Duration-3hrs.

Unit-I Review of Fluid Properties: Engineering units of measurement, mass, density, specific weight, specific volume, specific gravity, surface tension, capillarity, viscosity, bulk modulus of elasticity, pressure and vapor pressure. Fluid Static's : Pressure at a point, pressure variation in static fluid, Absolute and gauge pressure, manometers, Forces on plane and curved surfaces (Problems on gravity dams and Tainter gates); buoyant force, Stability of floating and submerged bodies, Relative equilibrium.

Unit-II Kinematics of Flow : Types of flow-ideal & real , steady & unsteady, uniform & non-uniform, one, two and three dimensional flow, path lines, streaklines, streamlines and stream tubes; continuity equation for one and three dimensional flow, rotational & irrotational flow, circulation, stagnation point, separation of flow, sources & sinks, velocity potential, stream function, flow nets- their utility & method of drawing flow nets.

Unit-III Dynamics of Flow: Euler's equation of motion along a streamline and derivation of Bernoulli's equation, application of Bernoulli's equation, energy correction factor, linear momentum equation for steady flow; momentum correction factor. The moment of momentum equation, forces on fixed and moving vanes and other applications. Fluid Measurements: Velocity measurement (Pitot tube, Prandtl tube, current meters etc.); flow measurement (orifices, nozzles, mouth pieces, orifice meter, nozzle meter, venturimeter, weirs and notches).

Unit-IV Dimensional Analysis and Dynamic Similitude: Dimensional analysis, dimensional homogeneity, use of Buckingham-pi theorem, calculation of dimensionless numbers, similarity laws, specific model investigations (submerged bodies, partially submerged bodies, weirs, spillways, rotodynamic machines etc.)

Unit-V Laminar Flow: Introduction to laminar & turbulent flow, Reynolds experiment & Reynolds number, relation between shear & pressure gradient, laminar flow through circular pipes, laminar flow between parallel plates, laminar flow through porous media, Stokes law, lubrication principles.

References: -

1. Modi & Seth; Fluid Mechanics; Standard Book House, Delhi
2. Som and Biswas; Fluid Mechanics and machinery; TMH
3. Cengel; Fluid Mechanics; TMH
4. White ; Fluid Mechanics ; TMH
5. Essential of Engg Hyd. By JNIK DAKE; Afrikan Network & Sc Instt. (ANSTI)
6. A Text Book of fluid Mech. for Engg. Student by Franiss JRD
7. R Mohanty; Fluid Mechanics By; PHI
8. Fluid Mechanics; Gupta Pearson.

List of Experiment (Expandable):

1. To determine the local point pressure with the help of pitot tube.
2. To find out the terminal velocity of a spherical body in water.
3. Calibration of Venturimeter
4. Determination of C_c , C_v , C_d of Orifices
5. Calibration of Orifice Meter
6. Calibration of Nozzle meter and Mouth Piece
7. Reynolds experiment for demonstration of stream lines & turbulent flow
8. Determination of metacentric height
9. Determination of Friction Factor of a pipe
10. To study the characteristics of a centrifugal pump.
11. Verification of Impulse momentum principle.

Course Contents

Category	Title	Code	Credit-4			Practical
IT-3	Dot.Net	AU/BM/CS/IP /ME/EE/EX/IT 406	L	T	P	Max. Marks-50 Min. Marks: 25 Duration: 3 hrs.
			-	-	4	

UNIT I Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT II Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. Advanced Features Of C# Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls

UNIT IV Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT V XML: Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using java script, Web Services

References:

1. C# for Programmers by [Harvey Deitel](#), [Paul Deitel](#), Pearson Education
2. Balagurusamy; Programming in C#; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH

List of Experiments/ program (Expandable):

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#
11. Working with Page using ASP .Net.
12. Working with Forms using ASP .Net
13. Data Sources access through ADO.Net,
14. Working with Data readers , Transactions
15. Creating Web Application.