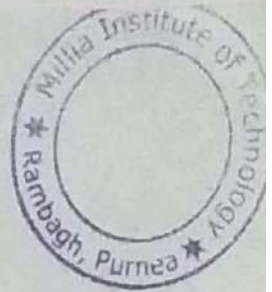# B. N. Mandal University, Laloonagar, Madhepura

Details of theory & Sessional Papers code of 2nd Year B. Tech. Course

Branch: CIVIL ENGINEERING

	Subject	Subject Code	Branch Code	L	T	P	Th. Ext.	Th. Int.	Sessional
01	Mathematics-III	MA-III	CE-201	3	1	0	70	30	---------
02	Numerical Methods & Computational Techniques	NMCT	CE-202	2	1	3	70	30	Numerical Methods & Computational Techniques
03	Building Science	B.S	CE-203	2	1	3	70	30	Building Science-1-50
04	Fluid Mechanics	F.M	CE-204	2	1	3	70	30	Fluid Mechanics-1-50
05	Mechanics of Solid	MOS	CE-205	2	1	3	70	30	Mechanics of Solid -
06	Engineering Geology	G&G	CE-206	2	1	3	70	30	Engineering Geology
07	Organizational Behavior & Industrial Psychology	OBIP	CE-207	3	1	0	70	30	---------
08	Surveying-I	S-I	CE-208	3	1	0	70	30	S-I-50
	Environmental Science	ES	CE-209	0	0	3			E-I-50
10	Civil Engg. Drawing	CED	CE-210	0	0	3			CED-100 50

CRSY 17/01/13

Expert-I
(External)
Name:
Designation:
Address:

Kr Anav
Expert-II
(Internal)
Name: Kumar Anand Vardhan Pati
Designation: HOD, CE
Address: Dept of CE
MIT, Purnia.

J Thawe 17·01·13
Dean
Faculty of Science & Engineering
BNMU, Madhepura

Vivek 17·111·13

Mathematics – III (CSE/EE/ME//CE/ECE/IT)

BRANCH CODE CE 201

FIRST TERM

1   ORDINARY DIFFERENTIAL EQUATIONS & SPECIAL FUNCITONS; series solution of differential equations (frobenious method). Bessel's equation. Its solution , Bessel's function of first & second kind, recurrence formula, legendre's equation, its solution, legendre polynomials, rodrigue's formula, orthogonality of legendre polynomial .

2   PARTIAL DIFFERENTIAL EQUATION; basic concept 1st & 2nd order -linear partial differential equation, classification of second order P.D.E boundary and initial conditions, wave equations, separation of variables, use of fourier series, D' Alembert's solution of wave rquation, heat equation, solution by fourier series.

SECOND TERM

3   COMPLEX ANALYSIS-I function of complex variables- limit, continuity , differentiability, and analyticity of function Cauchy-riemann equations, lapace's equation, harmonic function, cauchy's integral theorem, cauchy's integral formula, Taylor's and Laurent series, residues and its applications to evaluating real integrals.

4   PROBABILITY & STATISTICS; theorems on probability , including baye's rule random variable commulative distribution function, probability mass function, probability density function, mathematical ecpeciation., mean variance, moment, generating function &characteristics function , standard probability models binomials, poisson exponential , weibull, normal and lognormal, sampling & sampling distribution, chi –square and F distributions, large and small sample tests of significance.

Text books:
1   advanced engineering mathematics by R.K.jain & S.R.K Iyengar
2   higher engineering mathematics by B.S. grewal
3   fundamentals of mathematical statistics by V.K.kapoor & s.c.gupta –sultan &sons
4   References:
1   advance engineering mathematics by E. kreyszig 8th edition, jhon wiley &sons
2   complex variable and applications by Churchill & brown –mcgraw hill
3   elements of partial differential equation by I.N sneddon- Mcgra hill
4   introduction to probability & statistics for engineering by S.M ross - john wiley and sons, new York.
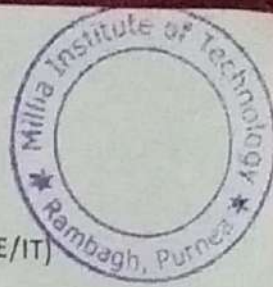
NUMERICAL METHOD & COMPUTATIONAL TECNIQUE (CSE/EE/ME/CE/ECE/IT)

BRANCH CODE-NMCT-202

L-T-P: 2-1-3

FIRST TERM

1. INTRODUCTION TO COMPUTER LANGUAGE:

Machine language, assembly language, high level language, compilers, problem solving using computer Algorithm, flowchart, examples

2. C/C++ PROGRAMMING:

Constants & variables, arithmetic expression, i/o statement, specification statement, control statement, subscripted variables, logical expression, function and subroutines, examples of programming should include numerical as well as non numeric applications, matrix operations, searching, sorting etc

SECOND TERM.

3. ITERATIVE TECNIQUE FOR SOLUTION OF EQUATION:

I.SOLUTION FOR NON LINEAR EQUATION-simple iteration scheme, bisection method, regula-falsi method, newton-raphson method, secant method, their rates of convergence, order of errors etc.

ii. SOLUTION OF LINEAR EQUATION-Gaussian elimination, matrix inversion by Gaussian method, computation of determinants, Jacobi and gauss seidal iteration method.

4. POLYNOMIAL APPROXIMATION: interpolation,several form of interpolating polynomials like lagrangian interpolation of polynomial and newtons forwared and backward difference formula,curvefitting(least square

5 NUMERICAL INTEGRATION: Trapezoidal method , Simpsons' rule, order of error in integration.

6. SOLUTION OF INITIAL VALUE PROBLEMS: Euler's method, range – kutta second order and fourth order methods, solution of boundary value problem-finite difference method.

TEXT BOOK:

1. NUMERICAL METHODS FOR SCIENTIFIC FOR ENGINEERING COMPUTATIONS BY M.K.JAIN,LYENGAR AND R.K JAIN, NEW AGE INTERNATIONAL PUBLISHERS, NEW DELHI

2. INTRODUCTORY METHOD OF NUMERICAL ANALYSIS BY S.S.SASTRY, PHI PVT. LTD.

REFERENCE BOOKS

1. NUMERICAL ANANLYSIS IN ENGINEERING BY RAMA B. BHAT, S.CHAKRAVARTY, NAORSA PUBLISHING HOUSE

2. ADVANCED ENGINEERING MATHEMATICS BY E.KREYSZIG, 8th EDITION BY JOHN WILLEY & SONS, NEW YORK.

CT LAB

WORKING IN WINDOWS ENVIROMENT,FORTRAN 77 PROGRAMMING BASED ON SYLLABUS

BUILDING SCIENCE   (BS) CE-203

L-T-P : 2-1-3

Theory :

First Term-

1. **Building construction** : Overview of building process: Introduction to Building Law and IS Codes Different types of loads in Buildings, Load Combinations, IS Code provisions for Loads in Buildings.   Lecture: 08

Foundation: shallow foundation (simple calculation)   Lecture: 02

3. **Super structure** : Load bearing masonry, arches, lintels, scaffolding, formwork, Floors and roofs – flat and pitched roofs, concerning floor finishes staircase and other element of construction; Doors and windows, Building services – vertical transportation, plumbing electrical, Ventilation and Air-conditioning, Energy efficiency, Fire protection, Acoustic and sound insulation. Damp proofing, termite proofing, Carpentry and joinery.   Lecture: 16

Second Term-

4. **Concrete** : Concrete making materials, properties and types of cement, properties of concrete in fresh and hardened state, durability, spatial coherence   Lecture:04

5. **Building stones** : Varieties of Indian stones. Quarrying blasting Dressing of stones, characteristics of good building stones, Slate, Marble artificial stones. Stone preservation. Brick and brick masonry; Manufacture & properties. Classification and specification, Brick masonry and principles of design of masonry structure.   Lecture:12

6. **Timber & Steel** : Properties and types miscellaneous materials; polymers and plastics .composites and smart materials.   Lecture:04

Text books :

1. Concrete Technology by Neville, A. M. & Brooks, J. J. Pearson Education

2. Civil Engineering Materials by Jackson, N. & Dhir, R. K. ELBS.

3. Building Construction by S. C. Renewal, Character publishing house Amend 1993

4. Civil Engineering Materials, TTTI Chandigarh

5. Construction Technology by Tony Bryan , Wiley

6. Advance Concrete Technology by Zogjin Li , Wiley

Reference Books :

1. "Construction Technology - Volumes 1 and 2, 2nd Edition" by R. Crudely, Longman, UK

2. Building Construction – volumes 1,2,3, and 4, 5th Edition by W. B .McKay. Orient Longman UK 1993

3. Materials for civil and construction Engineers" by Michael S. Mamlouk and JOHN P. Zaniewski, Addison

Longman Inc. USA

4. "Smart structure : Analysis and Design" by A. V. Srinivasan and D. M. McFarland. Cambridge" University UK,

2001.

Practical:

1. Laboratory testing of materials

2. Load Calculations based upon IS Code.

3. Calculation on Brick structure design.

FLUID MECHANICS (FM) CE-204

L-T-P : 3-0-3

Theory:

First Term-

Introduction: fluid properties: density, viscosity, compressibility, ideal and real fluid

1. **Hydrostatics:** fluid force on plane and curved surfaces, manometry, buoyancy, uniformly accelerated motion.

Lecture: 04

Lecture: 04

2. **Kinematics of fluid flow:** Generalized continuity equation, Irrotational motion and solution to Laplace equation, Concept of stream lines, Equipotential Lines, Flow Nets.

Lecture: 08

3. **Dynamics of fluid flow:** Control volume concepts, Euler and Bernoulli's theorems and various applications like pivot tube, venturimeter, orifice meter, notches and weir etc; Impulse momentum theory and application.

Second Term-

Lecture: 15

4. **Introduction to Navier Stokes Equation:** Flow of fluid in closed conduits, Laminar flow of viscous incompressible fluids, Darcy-Weisbach equation, Moody's diagram, and Minor losses Hardy-cross method for pipe networks.

Lecture: 12

5. **Forces on immersed bodies:** concepts of separation, drag force, circulation and lift force. Dimensional Analysis, Model Similitude: Theory and application.

Lecture: 07

Reference Book/ Text Books:

1. Fluid Mechanics by V.L.Streeter, E.B. and Wylie, McGraw Hill.
2. Fluid Mechanics by Fox & McDonald, John Wiley.
3. Fluid Mechanics by Munson, John Wiley.
4. Fluid Mechanics by F.M. White.
5. Fluid Mechanics with Engineering Application by R.L. Daugherthy, J.B. Franzini, E.J. Finnermore; McGraw Hill, International Ed.
6. I.H. Shames by Fluid Mechanics, PHI.

Practical:

Viscosity, Metacentric height, Orifice meter, Notches, Reynolds number, Impact of Jet.

MECHANICS OF SOLID - I (MOS-I) CE-205

L-T-P : 2-1-3

Theory :

First Term-

1. Rigid and deformable solids; Stress and strain : Tension, compression and shear. Lecture:03

2. Analysis of stresses, Basic Equilibrium equations, analysis of Strain Deformation, Strain Displacement Relations, Normal and shear Strains. Lecture:06

3. Transformation, principal stresses and strains, Maximum Stresses & Strains, Mohr's Circle. Volumetric Strain, compatibility Equations and boundary conditions, Strain rosettes, Velocity Field and Strain Rates. Generalized Hook's Law & Constitutive Relations for Solids, Elastic constants and their relations. Lecture:12

4. Method of sections for evaluating internal forces in bodies, review of free body diagrams, axial force, shear and bending moment diagram. Lecture:05

Second Term-

5. Axially loaded members force and deflections; Thermal Stresses. Lecture: 02

6. Bending & shear : classical theory, various cross-sectional shapes and composite sections of beams, shear stresses in beams. Lecture: 04

7. Deflection of beams : Bending deflection of simple beams by direct integration, singularity function method, Moment – Area Methods, deflection due to shear. Lecture: 04

8. Torsion : torsion of circular shaft, close coiled helical springs, Torsion of thin walled open and closed sections and non-circular sections. Lecture: 07

9. Combined stress; principle of superposition and its limitations. Lecture: 04

10. Introduction to energy methods. Lecture: 03

Text Books :

1. Mechanics of Solids by E.P.Popov, Pearson Education Pub.

2. Solid Mechanics by S.M.A. Kazimi, Tata McGraw Hill, New Delhi.

3. Strength of Materials by Ryder, G.H., Macmillan Press Ltd.
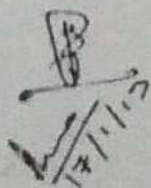
Reference Book :

1. Mechanics of Solids : An Introduction by S.H.Crandall, N.C.Dahi and T.V. Lardner, McGraw Hill

International and Tokyo.

Practical :

1. Tensile Test for M.S.

2. Hardness

3. Impact Test

4. Test for Anisotropic Substance – Wood, etc.

ENGINEERING GEOLOGY (EG) CE-206

L–T–P : 3–0–0

Theory:

First Term-

1. Basic Geology: General Geology, Mineralogy, Petrology (igneous, sedimentary and metamorphic), Structural geology, Crystallography.   Lecture:14

2. Engineering properties of rocks: Geomorphology (Geomorphic processes weathering, Erosion, Origin and formation of solids).   Lecture: 06

3. Geological hazards (landslides, earthquakes and volcanoes), Groundwater, Recent concepts in Geology, Plate tectonics and Sea – floor spreading.   Lecture: 06

Second Term-

4. Applied Geology: Geophysical mapping: seismic, resistivity, gravity, radar, geotomography, logging; Geological exploration of an engineering site.   Lecture: 12

5. Desk Study: Site investigation Boreholes: Remote sensing, GIS and GPS: Basic principle and their applications in studying and monitoring Lithosphere, Hydrosphere, Cryosphere and Atmosphere.   Lecture: 08

6. Cut Slopes in rocks and clays; Geological factors affecting the construction of dams, reservoirs and tunnels. Criteria and factors for site selection for Dam, tunnels, waste/radioactive disposal sites, Indian Geology, Outline of stratography of India.   Lecture: 10

Text Books:

1. A Textbook of Engineering and general Geology by Singh. P., S. K. Kataria and Sons, New Delhi.

2. Engineering Geology by D V Reddy, Vikash Publishing House Pvt. Ltd.

3. Element of Mineralogy in Engineering Geology by Read, H. H. Rutley's, CBS Publisher.

4. Experiments in Engineering Geology by Gokhale, K. V. G. K. and Roa, D. M., Tata McGraw Hill.

Practical:

Mineralogy, Optics, Study of rocks in hand specimen and under microscope; Topographical maps; Structural. Geological maps; Structural Geological problems; Engineering Geographical maps and Engineering Geological experiment; Geological fieldwork in and around Patna.

ORGANIZATIONAL BEHAVIOR & INDUSTRIAL PSYCHOLOGY (OBIP) CE-207

L T P : 3-0-0

1. Concept of organization & organizational Behavior.   Lecture: 02

2.

(a) Personality: meaning, concept , determinants, personality theories (psychoanalytic Theory, Trait Theory and Self Theory).

(b) Perception-meaning, concept, process of perception, significance of perception.

(c) Leaning- meaning. concept, nature, component of leaning process.

(d) Attitude- meaning, concept, factors in attitude formation, method of finding Employee's attitude.

(e) Value - Meaning and types, value and attitude – similarity and difference.

(f) Motivation- meaning, theory of motivation (Maslow's Theory & Herzberg's Theory).

Lecture: 14

3. (a) Group & Group Dynamics - concept, importance, classification of groups , reason for group, formation, group cohesiveness.

(b) Team work :meaning , concept, types , creating, an effective team.   Lecture: 04

4. (a) Communication- concept, process, importance, barrier.

(b) Organizational conflict- meaning, concept, types, stages of conflict, resolution of conflict.

(c) Power & politics- nature and concept, Ethics of power & politics, types of power.

(d) Leadership- concept, qualities and functions of a leader, approaches to the analysis of leadership.   Lecture: 10

5. Concept of organization theory: concept of organization structure, form of organizational structure, form of organizational culture.   Lecture: 04

6.

(a) Organizational effectiveness - concept , approaches, criteria of effectiveness.

(b) Organizational change - meaning, factors in Organizational change, process of planned change.

(c) Organizational Development - concept ,need of organizational development, difference between organizational development & management development.   Lecture: 12

Text Books :

1. Organizational behavior by Stephen P. Robbin & Seema Sanghi- pearson
2. Organizational behavior by L.M. Prasad-S Chand & sons

Reference Book :

1. Organization behavior: managing people and organization by Gregory moorehead – Biztantra

FIELD MEASUREMENT(SURVEYING-I) S-I   CE-208
L-T-P: 3-0-3

Theory :

First Term-

1. Introduction : Types of surveying, scale, principle of surveying, shrinkage of Maps.

Lecture: 04

2. Chain surveying : Types of chain, Handling .Erroneous chain Equipments .Principle of chain and equipments, Method of chain survey .Obstacles ,Field book and recording.   Lecture: 06

3. Compass surveying : Prismatic compass Bearings Traversing ,Local attraction, Adjustment .Plane Table survey .Equipments and uses principle of surveying .Closing error and adjustment methods of locating features .Two point problem and three point problem .Advantages and disadvantage Telescopic alidade.

Lecture: 12

Second Term-
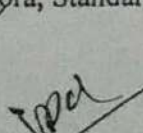
4. Leveling : Scope terms ,Equipments ,Types of level, Adjustment of dumpy level .Methods of leveling book and computation, missing data, Curvature and refraction correction. Reciprocal leveling contouring : Definition, Methods of contour survey, and plotting of contour. Area and volume.

Lecture: 11

5. Theodolite : Scope, Types, Adjustment of transit theodolite. Measurement of horizontal angles ,Errors and elimination, Methods of traversing, computation of bearings. Coordinate system Gale's traverse table, Missing data, plotting   Lecture: 06

6. Tachometry : Instrument, Tachometric constant. Analytic lens, principle, Computation, Beaman's Stadia arc, Subtense bar and subtense method, Tachometric plane table, Traversing, plotting.
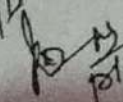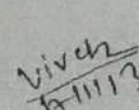
Lecture: 06

Text Books :

1. Surveying vol I and II by B. C Punmia, A. K Jain and A. K. Jain Laxmi Publications (P) Ltd., New Delhi.

2. Surveying, vol. I and II by K. R. Arora, Standard Book House, Delhi
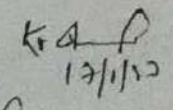
Practical :

Chain Survey, Compass Surveying, Plane Table Survey, Traversing, Leveling and Layout of a building.

ENVIRONMENTAL SCIENCE (ES) CE-20
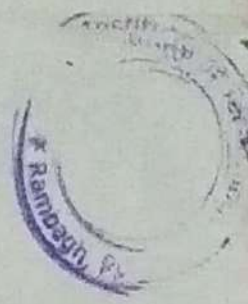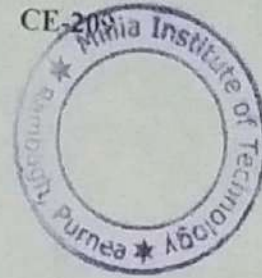
L-T-P : 0-0-3

Theory :

First Term-

1. **Sustaining Resources :** Environmental Quality : Water & Air Pollution. Effects and control of air and Water pollution; Introduction to solid waste and its management. Pollution of groundwater. Surface water and soils. Noise pollution; Renewable and Nonrenewable energy source.

Lecture: 12

2. **Toxicological Chemistry** and effects and risks of it on human health .   Lecture: 02

3. **Environmental Chemical** Analysis   Lecture: 01

Second Term-

4. **Humans and Sustainability**, Ecology and Sustaining Biodiversity   Lecture: 02

5. **Policy and legislation** for environmental protection.Current Environmental issues.Lecture: 04
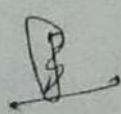
6. **Policy and legislation** for environmental protection,Current Environmental Issues.Lecture: 04
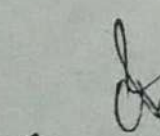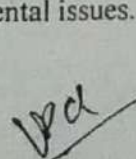
Text Books :

1. Introduction to Environmental Engineering and Science, G.M. Masters. Pearson Education

2. Environmental Science. Miller, Thomson Press .

3. Environmental Science, Wright, Pearson Education.

4. Principles of Environmental SCIENCE, W.P. Cunningham, Tata McGraw Hill.

5. Environmental Chemistry, Sawyer and McCarty, McGraw Hill

6. Environmental Chemistry, Manahan Stanley E. Lewis Publishers.
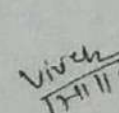
Practical :

1. Case Analysis based on theory.

2. Determination of simple environmental parameters in laboratory.

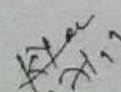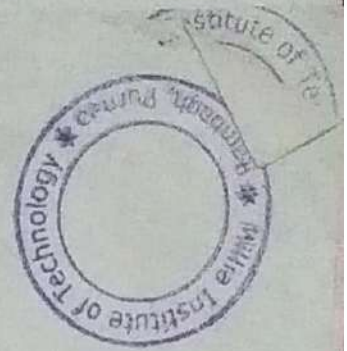3. Paper Presentation on current environmental issues.

CIVIL ENGINEERING DRAWING   (CED) CE-210

L-T-P : 0-0-3

First Term

1. Understanding of conventional signs and symbols.

2. Drawing of various details of residential buildings components : bonds and brickwork, doors, staircases, simple foundations.

3. Site and building planning : Site plants, simple one-bedroom house, two-storied house, multi-storied apartment building. framed buildings in steel and concrete.

4. Industrial and laboratory buildings.

Second Term

5. Drawing of framework details. floor and roofing systems, masonry. load bearing and non-load bearing wall

6. Working drawings of buildings.

7. Planning and layout of large-scale commercial facilities.

8. Introduction to AutoCAD.

Text Books :

(1) Building Drawing by B.P. Verma, Khanna Pub., Delhi

(2) Engineering Drawing by N.D. Bhatt.