Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 2nd YEAR (SEMESTER – III: CIVIL ENGINEERING)
Choice Based Credit Scheme w.e.f. 2019-20 (applicable to the students admitted in 2018)

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P/D		Theory	Practical			
1	MC 203C OR MC 201C	CONSTITUTION OF INDIA (GROUP-A) OR ENVIRONMENTAL STUDIES (GROUP-B) civil, ME	2	-	-	25	75	-	100	0	3
2	ECE 209C	BASIC ELECTRONICS	2	-	-	25	75	-	100	2	3
3	BT 221C	BIOLOGY FOR ENGINEERS (common with BT and ME)	3	-	-	25	75	-	100	3	3
4	Maths	MATHS III (TRANSFORM AND DISCRETE MATHEMATICS	2	-	-	25	75	-	100	2	3
5	CE 201C	STRENGTH OF MATERIALS	3	1	-	25	75	-	100	4	3
6	CE 203C	SURVEYING	3	1	-	25	75	-	100	4	3
7	CE 205C	FLUID MECHANICS	3	1	-	25	75	-	100	4	3
8	CE 207C	BUILDING CONSTRUCTION AND MATERIALS	3	-	2	25	75	-	100	4	3
9	CE 209C	STRENGTH OF MATERIALS LAB	-	-	2	25		75	100	1	3
10	CE 211C	SURVEYING LAB	-	-	2	25		75	100	1	3
11	CE 213C	FLUID MECHANICS LAB	-	-	2	25		75	100	1	3
12	ECE 289C	BASIC ELECTRONICS LAB	-	-	2	25		75	100	1	3
		Total	**21**	**3**	**10**	**300**	**600**	**300**	**1200**	**27**	
		MOOC					Humanities and Social Sciences				

Note:

1. **The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator prohibited in the examination.**
2. **Electronics gadgets including Cellular phones are not allowed in the examination**
3. **For student admitted in B. Tech. 1st Semester (C-Scheme) in 2019 and all trailing students, Examinations and evaluation o students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall b made aware about the reforms.**

MC 201C Environmental Studies

(Common for all branches of B.Tech and B.Arch)

L	T	P/D	Credits
3	--	--	0

Field Work	:	25Marks
Examination(Theory/Practical)	:	75Marks
Total	:	100 Marks
DurationofExamination	:	3 Hours

UNIT I **10 lectures**

The Multidisciplinary Nature of Environmental Studies, .Introduction to Environment: Definition, Scope, and importance of environmental studies; need for public awareness.
Environmental Pollution: Definition, Cause and effects of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Role of an individual in prevention of pollution, Pollution case studies

UNIT- II **10 lectures**

Natural Resources: Water resources: over-utilization, floods, drought, dams-benefits and problems; Mineral resources: Use and exploitation, environmental effects; Food resources : changes caused by modern agriculture, fertilizer-pesticide problems, water logging, Energy resources : Growing energy needs, renewable and non renewable energy sources; Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

UNIT –III **10 lectures**

Ecosystems and Biodiversity: Concept of an ecosystem, Structure and function, Energy flow, Ecological succession, ecological pyramids. Concept of Biodiversity, definition and types, Hot-spots of biodiversity; Threats to biodiversity, Endangered and endemic species of India, Conservation of biodiversity.

UNIT –IV **08 lectures + 05 lectures**

Social Issues and Environment: Water conservation, rain water harvesting, Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, Public awareness. Population growth, variation among nations, Family Welfare Programme.Human Population and the Environment - Population growth, Population explosion, Women and Child Welfare.

Field Work - Visit to a local area to document environmental assets—river/forest/grassland/hill/ mountain. Visit to a local polluted site—Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems—pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Total : 43

COURSE OUTCOMES:

B. Tech. (Civil Engg.) 2nd Year : Approved in 14th meeting of Academic Council held on 11.06.2019. Effective from Academic Session 2019-20 and applicable to all students admitted in 2018 and onwards.

On completion of the course, the students will be able to:

- Develop concepts of basic environmental factors.
- Introduce to the students the basic understanding of ecosystem and its structural and functional aspects and vast biodiversity
- Outline aspects of environmental issues.
- Understand the knowledge of energy resources and their environmental implications

REFERNCE BOOKS:

1. A Textbook of Environmental Studies by Asthana D.K. and Asthana Meera
2. Fundamental Concepts in Environmental Studies by Mishra D.D.
3. Environmental Studies by S.C Sharma M.P Poonia
4. Textbook of Environmental Studies for Undergraduate by ErachBharucha
5. Environmental Studies: Third Edition by R. Rajagopalan

Note:

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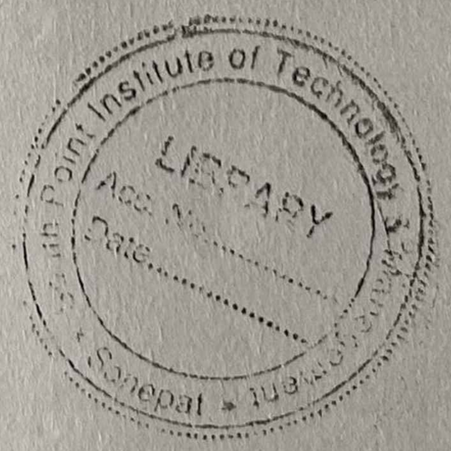

ECE 209C: BASIC ELECTRONICS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits
1	-	--	1

Class Work : 25 Marks
Examination : 75Marks
Total : 100 Marks
Duration of Examination : 3 Hours

UNIT I

Diodes and Applications : Semiconductor Diode - Ideal versus Practical, Resistance Levels, Diode Equivalent Circuits, Load Line Analysis; Diode as a Switch, Diode as a Rectifier, Half Wave and Full Wave Rectifiers with and without Filters; Breakdown Mechanisms, Zener Diode – Operation and Applications.

UNIT II

Special Semiconductor :Opto-Electronic Devices – LEDs,LCD,Photo Diode ,Phototransistor,solar cell,Silicon Controlled Rectifier (SCR) – Operation, Construction,Characteristics, Ratings, Applications.

UNIT III

Transistor Characteristics : Bipolar Junction Transistor (BJT) –Construction, Operation, Common Base, Common Emitter and Common Collector Configurations, Operating Point, Transistor as Amplifiers and Oscillators; Field Effect Transistor (FET) – Construction, Characteristics of Junction FET, Depletion and Enhancement type Metal Oxide Semiconductor (MOS) FETs, Introduction to CMOS circuits.

UNIT IV

Operational Amplifiers and Applications covering, Introduction to Op-Amp, Differential Amplifier Configurations, CMRR, PSRR, Slew Rate; Block Diagram, Pin Configuration of 741 Op-Amp, Characteristics of Ideal OpAmp, Concept of Virtual Ground.

Text/Reference Books:

1. David. A. Bell (2003), *Laboratory Manual for Electronic Devices and Circuits*, Prentice Hall, India
2. Santiram Kal (2002), Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India
3. Thomas L. Floyd and R. P. Jain (2009), *Digital Fundamentals* by Pearson Education, 4. Paul B. Zbar, A.P. Malvino and M.A. Miller (2009), *Basic Electronics – A Text-Lab. Manual,* TMH
5. R. T. Paynter (2009), *Introductory Electronic Devices & Circuits, Conventional Flow Version,* Pearson

Outcomes: At the end of course,student will be able to:

1. **Understand various characteristics of semiconductor diodes and apply them for generating new applications.**
2. **Have knowledge about special semiconductor diodes and their characteristics.**

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3. **Understand various transistor characteristics and their applications for designing other circuits.**
4. **Have knowledge of basic op-amp characteristics and their applications.**

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EE221C

BIOLOGY for Engineers

B.TECH. (Common with BT, ME & CE 3rd Semester and CHE, EE & EEE 4th Semester)
Choice Based Credit System (effective from Session 2019-20)

SEMESTER-IV

L	T	P	Credits		
3	1	0	4	Field work	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Examination	3 Hrs

UNIT-I

Introduction: Significance of biology; why study biology ; Biological observation in history that led to the discovery of some major engineering basics(Brownian motion & origin of thermodynamics); Fundamental similarities and difference between science and engineering- human as the best machines, comparison between eye camera, flying of a bird and aircraft etc.

Classification: classification based on (a) cellularity- unicellular or a multicellular (b) Ultrastructure-prokaryotes or eukaryotes (c) Energy and carbon utilization- autotrophs and lithotrophs (d) Ammonia excretion –aminotelic, uricotelic (e) Habit- aquatic or terrestrial ; Molecular Taxonomy three major kingdoms of life.

Single-celled organism-Microorganism and Microbiology: concept of single called organism , species and strains; Identification and classification of microorganism ; Ecological aspects of single celled organism; Microscopy.

UNIT-II

Biomolecules: Molecules of the life –Monomeric unit and polymeric structure –sugar , starch and cellulose , Amino acid and proteins; Nucleotides and DNA/RNA;Two carbon unit and lipids.

Proteins and Enzymes: proteins structure and function ; Hierarchy in protein structure –primary , secondary , tertiary and quaternary structure; proteins as enzymes, transporters , receptors and structural elements; Enzymes classification and mechanism of action ; Enzymes catalysed reaction ; Enzyme kinetic and kinetic parameters;RNA catalysis

UNIT –III

Genetics: Genetics is to biology what Newtons law are to physics; model laws of genetics; concept of allele, recessiveness and dominance, segregation and independent assortment; Genetic material passes from parent to offspring ; Epistasis; Mapping of phenotype yto genes, gene/linkage mapping ; single gene disorder in human ; meiosis and mitosis.

Genes, Chromosomes and information transfer: DNA as genetic material ; Hierarchy of DNA structure single stranded to double stranded to nucleosomes to chromosomes; Moleculear basis of information transfer concept of genetic code ; Universality and degeneracy of genetic code.

UNIT-IV

Metabolism: Similarities between fundamental principles of energy transaction in physical and biological world; Thermodynamics as applied to biological system; Exothermic and endothermic versus endergonic and exergonic reaction; Concept of $K_{eq}$and its relation to standard free energy ; Spontaneity; APT as an energy currency; Glycolysis and Krebs cycle (breakdown of glucose to CO_2 to H_2O); Photosynthesis (synthesis of glucose from CO_2 toH_2O); Energy Yielding and energy consuming reaction; Concept of energy change.

TEXT BOOK:

1. Biology : a Gopal approach Campbell , N.A Reece, J.B Urry ,Lisa; Cain M.L Wasserman , S.A Minorsky,P.VJackson, R.B Person Education ltd
2. Outline of Biochemistry , conn E.E Stumpf, P.K Burening ,G; Doi, R.H;John Wiley and sons

REFERENCE BOOK:

1. Principles of Biochemistry(V Edition) by Nelson, D.L; and Cox, M.M.W.H Freeman and company.
2. Molecular Genetics (second Edition) stent G.S; Calender , R.W.H Freeman Company Distributed by satishkumarjain for CBS Publisher.
3. Microbiology , Prescott, L.M.J.P; Harley and CA Klein 1995, 2nd edition W.M.C Brown Publisher.

Note:

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MATH 215C
MATHEMATICS-III
(Transform & Discrete Mathematics)
B.Tech. Semester-III (CE)
(w.e.f. Session 2018-2019)

L T P
2 0 0 (2 Credits)

Marks for External Exam: 75
Marks for Internal Exam : 25
Total : 100
Duration of Exam : 3 Hours

UNIT-I (9 Lectures)

Basic operations on sets, Cartesian products, disjoint union (sum), and power sets. Different types of relations, their compositions and inverses. Different types of functions, their composition and inverses.

UNIT-II (9 Lectures)

Syntax and semantics, proof systems, satistiability, validity, soundness, completeness, deduction theorem etc. Decision problems of propositional logic. Introduction to first order logic and first order theory. Basic counting techniques - inclusion and exclusion, pigeon-hole principle, permutation and combination.

UNIT-III (9 Lectures)

Polynomials, Orthogonal Polynomials-Lagrange's, Chebysev Polynomials; Trigonometric Polynomials, LaplaceTransform, Properties of Laplace Transform, Laplace transform of periodic function. Finding inverse Laplace transform by different methods, solving ODEs by Laplace Transform method.

UNIT-IV (9 Lectures)

Fourier transforms: properties, methods, inverses and their applications.

Text Books:

1. C. L. Liu, Elements of Discrete Mathematics, 2nd Ed., Tata McGraw-Hill, 2000.
2. S. Lipschutz and M.L. Lipson, Schaum's Outline of theory and problems of Discrete Mathematics, 2nd Ed., Tata McGraw-Hill, 1999.
3. Erwin Kreyszig -Advanced Engineering Mathematics, 9th Edition, John' Wiley & Sons, 2006.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.

Reference Books:

1. J.P. Tremblay and R.P. Manohar, Discrete mathematics with Applications to Computer Science, Tata McGraw-Hill, 1997.

B. Tech. (Civil Engg.) 2nd Year : Approved in 14th meeting of Academic Council held on 11.06.2019. Effective from Academic Session 2019-20 and applicable to all students admitted in 2018 and onwards.

2. R. C. Penner, Discrete Mathematics: Proof Techniques and Mathematical Structures, World Scientific, 1999.
3. Erwin Kreyszig -Advanced Engineering Mathematics, 9th Edition, John' Wiley & Sons, 2006.
4. S.S. Sastry, Engineering Mathematics, PHI, Vol. I & II.
5. Veerarajan T., Engineering Mathematics, Tata McGraw-Hill, New Delhi, 2008.

Course outcomes:

1. The students will understand different types of sets, relations and functions.
2. The students will understand Syntax and semantics, deduction theorem, decision problems of propositional logic and basic counting techniques: permutation and combination.
3. The students will be come across various Polynomials such as-Lagrange's, Chebysev Polynomials, Trignometric Polynomials.
4. The students will be able to solve various engineering mathematical problems using various transforms such as Laplace Transform and Fourier Transform.

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CE 201C STRENGTH OF MATERIALS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits
3	1	--	4

Class Work	:	**25 Marks**
Examination	:	**75Marks**
Total	:	**100 Marks**
Duration of Examination	:	**3 Hours**

Course Outcomes :

At the end of the course, the student will be able to:

CO1	Knowledge of various types of stresses and strains and their analysis
CO2	Analyze of forces on statically determinate beams
CO3	Analyze of deformations of statically determinate beams
CO4	Analyze of columns loaded axially and eccentrically.
CO5	Analyze the determinate trusses, thin cylinders and spheres.

Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO5	PO6	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	2	1	2	1	-	1	1	2	2	2
CO2	2	2	1	2	2	-	-	2	1	1	1	3	2
CO3	3	2	2	1	-	1	1	-	2	2	2	2	2
CO4	2	1	2	1	1	1	1	1	1	1	2	3	2
CO5	2	1	2	1	2	1	1	1	2	1	2	2	2

UNIT – I

Introduction: Concept of Equilibrium General Equilibrium equations, concept of free body diagrams , Concept of stress and strain, generalized Hooke's law, Stress-strain diagram of ductile and brittle material, compound and composite bars, thermal stresses, Analysis of Principal stresses and Strains, Mohr's stress circle, Relationship among elastic constants.

Shear force and Bending moment diagrams: Types of load on beam and frames, classification of beams, statically determinate and indeterminate problems, shear force and bending moment diagrams: simply supported, overhung and cantilever beams subjected to any combination of point loads, uniformly distributed and varying load and moment, relationship between load, shear force and bending moment.

UNIT – II

Theory of pure bending: Centroid of simple and built up section, second moment of area, derivation of flexural formula for straight beams, bending stress calculation for beams of simple and built up section, RCC beams.

Shear Stresses in Beams: Shear stress formula for beams, shear stress distribution in beams.

Slope & Deflection: Relationship between bending moment, slope & deflection, Mohr's theorem, moment area method, method of integration, Macaulay's method, calculations for slope and deflection of

(i) cantilevers and (ii) simply supported beams with or without overhang under concentrated load, Uniformly distributed loads or combination of concentrated and uniformly distributed loads.

UNIT – III

Torsion of Circular shafts: Basic assumptions, torsion formula, power transmitted by shafts, design of solid and Hollow shafts based on strength and stiffness.

Columns & Struts: Column under axial load, concept of instability and buckling, slenderness ratio, derivation of Euler's formulae for the elastic buckling load, Eulers, Rankine, Gordon's formulae Johnson's empirical formula for axial loading columns and their applications, eccentric compression of a short strut of rectangular & circular sections.

UNIT - IV

Strain energy: strainenergy under axial, bending, shear, torsion, gradual, sudden and impact loading, theories of failures

Analysis of determinate Trusses Introduction, determination of forces in member of trusses by method of joints, method of sections,Deflection of Joints of plane frames by castigliano's first theorem and unit load method.

Thin cylinder and Spheres: Introduction, stresses and strains in thin cylinders and spherical shell, volumetric change, wire wound thin cylinders, thin vessels subjected to internal pressure.

Text Books

1. Strength of Materials by G H Ryder, ELBS publishers
2. Elements of Strength of Materials by Timoshenko & Young, East- West Press, New Delhi
3. Mechanics of Materials by Beer and Johnston, Tata McGraw Hill.
4. Elementary Structural Analysis, Norris & Wilbur, McGraw Hill Publisher
5. Engineering Mechanics Shames

Reference Books

1. Strength of Materials by Sadhu Singh, Khanna Publishers
2. Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.
3. Fundamentals of Solid Mechanics by M L Gambhir, Prentice Hall of India
4. Strength of Materials Ramamurtham and Narayanan, S. Chand & Co.
5. Fundamentals of Structural Analysis B D Nautiyal, New Age Publishers

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CE 203C: SURVEYING

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits
3	1	--	4

Class Work : 25 Marks
Examination : 75Marks
Total : 100 Marks
Duration of Examination : 3 Hours

COURSE OUTCOMES:

After completion of course the students will be able to

1. Know different methods and techniques used in surveying and the applications
2. Apply the concept of tachometry and levelling in surveying difficult and hilly terrains to obtain the topographical map of area.
3. To use survey instruments in carrying out survey, collect data, write reports and able to perform required calculations

	PO1	PO2	PO4	PO6	PO7	PO11	PSO1	PSO2	PSO3
CO1	1	3	2	1	1	1	1	3	2
CO2	3	3	1	2	-	1	1	3	1
CO3	3	3	1	-	1	1	1	3	2

UNIT – I

Introduction to Surveying: Definition, importance, Objectives, History of surveying and mapping, Importance, Maps and maps Numbering systems, Maps, Scale, Principles of survey, Classification of surveys, different techniques of surveying, Chain Surveying: Ranging, Chaining, Offsets, Errors in Chaining, Corrections to length measured with a tape

Compass surveying & Plane Table Surveying: Purpose of compass surveying, Comparison of compass surveying and chain surveying, Dip, Magnetic Declination, W.C.B., Q.B., and R.B Introduction to plane table surveying, principle, instruments, working operations, setting up the plane table, centering, leveling, Orientation, methods of plane table survey, danger circle, Lehmann's Rules, errors in plane tabling.

UNIT – II

Leveling: definitions of terms used in leveling, different types of levels, parallax, staves, adjustments, bench marks, classification of leveling, booking and reducing the levels, rise and fall method, line of collimation method, errors in leveling, permanent adjustments, Two peg test, reciprocal leveling, Corrections to curvature and refraction, cross sections and longitudinal leveling.

Trigonometric Leveling: Definitions & terms, curvature & refraction Methods: direct & reciprocal, eye and object correction, coefficient of refraction. **Contours:** Definition, representation of reliefs, horizontal equivalent, contour interval, characteristics of contours, methods of contouring, contour gradient, uses of contour maps.

Tachometry: Definitions and terms used in tachometry, angular tachometry with staff vertical and staff inclined, Analytic lens theory, Tachometric field work, tangential method of tachometry, direct reading tachometer.

Theodolite Traversing: types of theodolities, measurement of angles, temporary and permanent adjustments, closed & open traverse, consecutive and independent co-ordinates, advantages & disadvantages of traversing closing error, Bowditch, Transit rules.

UNIT – IV

Triangulation: Triangulation systems, classification, strength of figure, selection of triangulation stations, grade of triangulation, field work of triangulation, triangulation computations, Introduction to EDM, Total Station and its working, survey adjustment and treatment of observation, adjustment of triangulation figures by method of least squares.

Curves: Definition, elements of a simple curve, different methods of setting out a simple circular curve, elements of a compound curve, reverse curves, introduction of transition curves, vertical curves and sight distances.

Text Books

1. Surveying volume 1 and 2 by S.K. Duggal, McGraw Hill Publishers, New Delhi
2. Surveying Vol. I and II by B.C. Punmia, Luxmi Publications, New Delhi
3. Syrveying and Levelling by R. Subramanian, Oxford University Press.
4. Plane Surveying by A.M. Chandra, New Age International Publishers

Reference Books

1. Surveying by N. Singh, Tata McGraw Hill, New Delhi.
2. A Text Book of Surveying by C.Venkataramiah, Universities Press, Hyderabad

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L	T	P	Credits
3	1	--	4

CE 205C: FLUID MECHANICS
B. Tech. 2nd Year (Semester – III)

Class Work	:	25 Marks
Examination	:	75Marks
Total	:	100 Marks
Duration of Examination	:	3 Hours

COURSE OUTCOMES:

After completion of the course the students are able to -

1. Know the details of various types of flow and fluids properties.
2. Familiar with pressure measurements and flow measuring devices.
3. Apply the concept of stability of floating and submerged body.
4. Solve various problems related to fluid dynamics equations and types of losses in pipes.
5. Apply of concept of drag, lift and buoyancy on a fluid in real life.

	PO1	PO2	PO4	PO6	PO7	PO9	PO11	PSO1	PSO2	PSO3
CO1	-	-	3	-	1	-	1	-	2	1
CO2	3	3	1	2	1	-	1	1	3	1
CO3	3	3	2	2	-	-	1	1	2	1
CO4	2	2	3	2	-	1	-	1	3	2
CO5	2	2	2	2	1	1	1	1	2	1

1: Slight (Low) **2**: Moderate (Medium) **3**: Substantial (High) "-": no correlation

UNIT - I

Scope& development of Fluid Mechanics Fluid properties – Density, Specific weight, Viscosity, Kinematic and Dynamic viscosity, Surface tension, Compressibility, Newtonian and Non Newtonian fluids, Types of fluids, capillary action. Kinematics of fluid motion, Classification of flow:, Continuity equations in Cartesian coordinates, Velocity Potential, Stream Function and Flow nets. Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number.

UNIT - II

Fluid statics – Absolute and Gauge pressure, Measurement of pressure, Mechanical gauges, Barometers, Piezometers, Simple and Differential manometer, Inclined manometer, and Micro manometer. Hydrostatic forces on plane horizontal, Vertical and Inclined surfaces, Curved surface. Buoyant force, Archimedes principle, Metacentric height, Theoretical and Experimental determination of metacentric height. Stability of floating and submerged bodies, Dimensional Analysis and Dynamic Similitude, Buckingham's π-Theorem.

UNIT - III

Fluiddynamics and pipe flows – Euler's equation of motion, Bernoulli's equation and its limitations, Momentum equation, Energy and Momentum correction factors, Energy losses in pipe flows, Darcy-Weisbach equation, Estimation of friction factor, Loss at sudden expansion, contraction and bends, Pipe flow computations, Hydraulic gradient and total energy lines, Pipes in series and parallel. Flow measuring devices: Venturimeter and Orifice meters, etc.

UNIT - IV

Laminar flow- Navier stokes equation of motion (no derivation), Laminar flow through pipes, parallel plates, Couttee flow, Flow past a sphere, Stokes law.

Boundary layer Theory- development of boundary layer on a flat surface, boundary layer thickness, laminar and turbulent boundary layers, separation of boundary layer and methods for prevention.

Drag and Lift – Definitions, Pressure drag and Friction drag, Stream line and Bluff bodies, Total drag, Drag at different Reynolds numbers, Profile drag. Drag characteristics of two dimensional bodies, Circulation, Lift and Magnus effect, Lift characteristics.

Text Books:

1. R. J. Garde and Mirajgaonkar, "Engineering Fluid Mechanics", Nem Chand & Brothers, Roorkee.
2. K L Kumar, "Engineering Fluid Mechanics", Eurasia Publishing House.
3. R.K. Bansal, "Fluid Mechanics and Hydraulic Machine", Laxmi Publications(P) Ltd. New Delhi.

Reference Book

1. H. Schlichting, "Boundary Layer Theory", McGraw Hill Publishing Company, New York.
2. Fox R. W. and McDonald, A T, "Introduction to Fluid Mechanics", John Wiley Wilson
3. Fluid Mechanics Through Problems, R J Garde,Nem Chand & Brothers, Roorkee
4. Hydraulics and Fluid Mechanics, P N Modi & S M Seth
5. Streeter, V L and Benjamin, W E , "Fluid Mechanics", McGraw Hill.

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CE 207C: BUILDING CONSTRUCTION AND MATERIALS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits
3	--	2	4

Class Work : 25 Marks
Examination : 75Marks
Total : 100 Marks
Duration of Examination : 3 Hours

Course Outcomes :

At the end of the course, the student will be able to:

CO1	Develop the conceptual knowledge in building material and masonry.
CO2	Select appropriate material like cement, steel stones etc. in given field situation.
CO3	Develop awareness about latest building materials.
CO4	Understand the importance of drawings in Civil Engineering and will be able to draw the drawings of various structural and non-structural members.

Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	2	2	2	2	2	2	2	3	2
CO2	2	1	2	2	2	3	2	2	2	1	2	2	3	2
CO3	2	2	2	2	2	2	2	-	1	1	1	2	3	2
CO4	2	2	2	1	2	1	-	1	2	2	2	2	3	2

UNIT - I

Bricks: Composition of good brick earth, harmful ingredient, manufacture of bricks, characteristics of good bricks, testing of bricks, classification of bricks as per IS 1077-1985.
Rocks and Stones: Classification of rocks, test for stones, characteristics of a good building stone, deterioration of stones, common building stones of India, comparison of the brick work and stone work.
Timber: Classification and identification of timber, defects in timber, characteristics of good timber, seasoning of timber and its methods, preservation of timber,

UNIT - II

Cement: Types, Manufacture, basic properties of cement compounds, grades, packing, storage, quality control and curing, additives, special cements, all testing as per IS.
Steel: Manufacture of steel, market forms of steel e.g. mild steel and HYSD steel bars, rolled steel sections, stainless steel mortars
Aggregates: Classification of Aggregates, Characteristics of Aggregate, Deleterious Materials and Organic Impurities, Soundness, Alkali-Aggregate Reaction, Thermal Properties of Aggregate, Fine Aggregate, Coarse Aggregate, Broken Brick Coarse Aggregate, Testing of Aggregates

UNIT - III

Masonry, stone masonry, basic terms, materials for stone masonry, classification, dressing of stones, joints in stone masonry, Brick Masonry, laying tools, basic terms, bonding of bricks, tools, inspection of brickwork, strength of brick work, Cavity walls, features, wall ties, construction of cavity wall, Lintels.
Construction equipment's: Modern equipment's used in the construction of muiti storey buildings and bridges

UNIT - IV

Earthwork, Damp proof course: Points of its requirement in buildings, D.P.C. at Plinth level, in basement and roof tops etc., Basement & Retaining walls. Drawings.
Foundation types and suitability, spread, arch, combined, cantilevered, Raft, Grillage, Piles & wells, Footings in block cotton soil, IS Specifications and drawings.
Stairs & Stair cases: Suitability of location, stairs in multi-storeyed buildings, Residential and public buildings, dimensions, Requirements, classification, types of stairs, Lift & escalators, drawings.

Text Books

1. Building Materials by P C Varghese, PHI.
2. Engineering Materials, by S.C. Rangawala, Charotar Publishing House, Anand.
3. Building Construction by Sushil Kumar, Standard Publisher and Distributors.
4. Building Construction by B. C. Punima, Laxmi Publisher House

Reference Books

1. Engineering Materials, by Sushil Kumar, Metropolitan Press
2. Engineering Materials by N.C. Choudhary, Technical Publishers.
3. Materials Science, J.C. Anderson & KDB Lever, ELBS fifth Edn., 2004.
4. Indian Practical Civil Engg. Handbook, P N Khanna, Engineers Publishers, 2000.
5. National Building Code, B. I. S.

Note:

1. In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

CE 209C: STRENGTH OF MATERIALS LAB

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits
--	--	2	1

Class Work : 25 Marks
Examination : 75Marks
Total : 100 Marks
Duration of Examination : 3 Hours

Course Outcomes :

At the end of the course, the student will be able to: **A student will be able to achieve the followings if he undergoes through this laboratory course**

CO1	Testing materials' properties
CO2	Suitability of structural steel
CO3	Understand flexural and torsional behavior

Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO5	PO6	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	1	1	2	1	1	-	1	-	2	3	2
CO2	2	1	2	1	1	-	1	2	1	1	2	3	2
CO3	3	2	2	1	-	1	1	-	2	2	2	3	3

List of Experiments:

1. To determine Rockwell hardness number of the specimen of steel/soft metal.
2. To determine Brinnel hardness number of the specimen of steel/soft metal.
3. To determine Vickers hardness number of the specimen of steel/soft metal.
4. To study the behavior of ductile material under tension on Universal Testing Machine
5. To study the behavior of brittle material under tension on Universal Testing machine
6. To study the behavior of brittle material under compressionon Universal Testing machine
7. To determine the modulus of rigidity of brass bar on torsion testing machine
8. To determine the impact strength of M.S./C.I. specimen on Izod impact testing machine.
9. To determine the impact strength of M.S./C.I. specimen on Charpy impact testing machine.
10. To determine Young's modulus of the material of a beam simply supported at the ends and carrying a concentrated load at the center.

Note: Seven experiments are to be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE 211C: SURVEYING LAB

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits
--	--	2	1

Class Work : 25 Marks
Examination : 75 Marks
Total : 100Marks
Duration of Examination : 3 Hours

Course outcomes: On completion of the course, the students will be able to:

1. use conventional surveying tools such as chain/tape, compass, plane table, level in the field of civil engineering applications such as structural plotting and highway profiling
2. apply the procedures involved in field work using advanced surveying equipment and to work as a surveying team
3. take accurate measurements, field booking, plotting and adjustment of errors can be understood

	PO1	PO2	PO4	PO9	PSO1	PSO2	PSO3
CO1	3	2	2	2	1	2	1
CO2	1	3	1	-	-	3	1
CO3	3	3	2	1	1	2	1

1: Slight (Low) **2**: Moderate (Medium) **3**: Substantial (High) "-": no correlation

List of Experiments

1. Chain Survey of an area
2. Leveling Exercises.
3. Measurement of vertical and horizontal angles with Theodolite.
4. Tachometric Survey
5. Tachometric Constants.
6. Two point / three point problem.
7. Plane table survey of an area.
8. Setting out a simple circular curve by different methods.
9. Setting out transition curve.
10. Measurements with Total Station.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B. Tech. (Civil Engg.) 2nd Year : Approved in 14th meeting of Academic Council held on 11.06.2019. Effective from Academic Session 2019-20 and applicable to all students admitted in 2018 and onwards.

L	T	P	Credits
--	--	2	1

CE 213C: FLUID MECHANICS LAB

B. Tech. 2nd Year (Semester – III)

Class Work	:	**25 Marks**
Examination	:	**75 Marks**
Total	:	**100 Marks**
Duration of Examination	:	**3 Hours**

LABORATORY OUTCOMES: upon successful completion of this course, it is expected that students will be able to:

1. Understand the flow calculation through orifice meter and venturimeter
2. Understand the application of Bernoulli equation
3. Use appropriate type of flow measuring devices.
4. Know various types of losses in pipe flow

	PO1	PO2	PO4	PO6	PO7	PO9	PSO2	PSO3
CO1	1	2	-	2	1	2	2	1
CO2	1	2	1	-	1	-	1	2
CO3	3	1	2	2	1	1	1	-
CO4	2	2	2	2	-	1	2	2

1: Slight (Low) **2**: Moderate (Medium) **3**: Substantial (High) "-": no correlation

List of Experiments

1. Verification of Bernoulli's Theorem.
2. Calibration of Venturimeter.
3. Calibration of an orifice meter.
4. Determination of Coefficients of Contraction, Velocity and Discharge of a circular orifice.
5. Determination of friction factor for pipes.
6. Visualization of laminar and turbulent flow and estimating critical Reynold's number.
7. Determination of metacentric height of a ship model.
8. To measure the velocity distribution over a flat surface in a wind tunnel and to determine the Reynold's no. and boundary layer thickness along the plate.
9. To measure the pressure distribution around a cylinder in a wind tunnel and to calculate the coefficient of drag at different Reynold's number.

Note: Students are required to complete at least eight experiments from the above list.

ECE 289C: BASIC ELECTRONICS LAB

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits
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Class Work : 25 Marks
Examination : 75Marks
Total : 100 Marks
Duration of Examination : 3 Hours

Experiment I: To conduct laboratory Session covering, Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT and DIP), Bread Boards and Printed Circuit Boards (PCBs);

Experiment II: To conduct laboratory Session covering Identification, Specifications, Testing of Active Devices – Diodes, BJTs, JFETs, MOSFETs, Power Transistors, SCRs and LEDs.

Experiment III: To study the operation of Digital Multi Meter, Function / Signal Generator, Regulated Power Supply (RPS), Cathode Ray Oscilloscopes; Amplitude, Phase and Frequency of Sinusoidal Signals using Lissajous Patterns on CRO; (CRO);

Experiment IV: To examine the experimental Verification of PN Junction Diode Characteristics in A) Forward Bias B) Reverse Bias, Zener Diode Characteristics and Zener Diode as Voltage Regulator, Input and Output Characteristics of BJT in Common Emitter (CE) Configuration.

Experiment V: To study Drain and Transfer Characteristics of JFET in Common Source (CS) Configuration.

Experiment VI: Study of Half Wave and Full Wave Rectification, Regulation with Filters, Gain and Bandwidth of BJT Common Emitter (CE) Amplifier.

Experiment VII: To study Op-Amp Applications – Adder, Subtractor, Voltage Follower and Comparator; Op-Amp Applications – Differentiator and Integrator, Square Wave and Triangular Wave Generation.

Experiment VIII: To study Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR Integrated Circuits (ICs).

Experiment IX: To verify Truth Tables and Functionality of Flip-Flops – SR, JK and D Flip-Flop ICs.

Experiment X: To study Serial-In-Serial-Out and Serial-In-Parallel-Out Shift operations using 4-bit/8-bit Shift Register ICs; Functionality of Up-Down / Decade Counter ICs.

Note: Seven experiments are to be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

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