

19BS2111:PROBABILITY AND STATISTICS

Course Category	Basic Science	Credits	3
Course type:	Theory	Lecture-Tutorial-practice	3-0-0
Pre requisites:	Mathematical Knowledge at pre-university level	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives:

To learn

- The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.
- The basic ideas of statistics including measures of central tendency, correlation and regression.
- The statistical methods of studying data samples.

Course outcomes:

After learning the contents of this paper the student must be able to

- Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.

UNIT - I: Basic Probability

Probability spaces, conditional probability, independent events, and Bayes' theorem. Random variables: Discrete and continuous random variables, Expectation of Random Variables, Moments, Variance of random variables, Chebyshev's Inequality

UNIT - II: Discrete Probability distributions

Binomial, Poisson, evaluation of statistical parameters for these distributions, Poisson approximation to the binomial distribution

UNIT - III: Continuous Random variable & Distributions

Continuous random variables and their properties, distribution functions and densities, Normal, exponential and gamma distributions, evaluation of statistical parameters for these distributions

UNIT - IV: Applied Statistics

Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves; Correlation and regression – Rank correlation.

UNIT - V: Testing of Hypothesis

Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means; Test for single mean, difference of means for small samples, test for ratio of variances for small samples.

TEXT BOOKS:

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, keying Ye, Probability and statistics for engineers and scientists, 9th Edition, Pearson Publications.
2. Fundamentals of Mathematical Statistics, Khanna Publications, S C Guptha and V.K. Kapoor.

REFERENCES:

1. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations
2. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.

19CE2112: SURVEYING AND GEOMATICS

Course category:	Professional Core	Credits	3
Course type:	Theory	Lecture-Tutorial-practice	3-0-0
Pre requisites :	Physics and Mathematics	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives: The first step in engineering practice is surveying and the soundness of any civil engineering work is dependent on the reliability and accuracy of surveying. Therefore, it is imperative that a student of engineering should have good knowledge of surveying. To impart the knowledge of surveying and latest technologies in surveying it is necessary to introduce this subject in the curriculum.

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

- **Calculate** angles, distances and levels
- **Identify** data collection methods and prepare field notes
- **Understand** the working principles of survey instruments
- **Estimate** measurement errors and apply corrections
- **Interpret** survey data and compute areas and volumes

UNIT – I

Introduction and Basic Concepts: Introduction, Objectives, classification and principles of surveying, Scales, Conventional symbols and Code of Signals, **Chain Surveying-** Approximate methods- Principles of chain surveying- basic definition- Direct Methods- Chains- Tapes, ranging, Tape corrections

Compass Surveying- Bearings, included angles, Local Attraction, Magnetic Declination, and dip.

UNIT – II

Leveling- Basics definitions, types of levels and levelling staves, temporary adjustments, methods of levelling, booking and Determination of levels- HI Method-Rise and Fall method, -Effect of Curvature of Earth and Refraction, Reciprocal levelling **Contouring-** Introduction- Characteristics and uses of Contours, Direct & Indirect methods of contour surveying, interpolation and sketching of Contours

Unit-III

Computation of Areas and Volumes: Areas - Determination of areas consisting of irregular boundary and regular boundary, Area of traverse-coordinates, MDM, DMD methods, departure and total latitude method, Planimeter.

Volumes - Computation of areas for level section- determination of volume of earth work in cutting and embankments, volume of borrow pits, capacity of reservoirs.

UNIT – IV

Theodolite Surveying: Types of Theodolites, Fundamental Lines, temporary adjustments, measurement of horizontal angle by repetition method and reiteration method, measurement of vertical Angle, Trigonometrical levelling when base is accessible and inaccessible.

Tacheometric Surveying: Principles of Tacheometry, stadia and tangential methods of Tacheometry.

Curves: Types of curves and their necessity, elements of simple curve, setting out of simple Curves, Introduction to compound curves.

UNIT-V

Modern Surveying Methods: Total Station and Global Positioning System. : Basic principles, classifications, applications, comparison with conventional surveying. Electromagnetic wave theory - electromagnetic distance measuring system - principle of working and EDM instruments, Components of GPS – space segment, control segment and user segment, reference systems, satellite orbits, GPS observations. Applications of GPS.

TEXT BOOKS:

1. Surveying (Vol – 1, 2 & 3), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi.
2. Arora K R “Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 2004

REFERENCES:

1. Chandra A M, “Higher Surveying”, New age International Pvt. Ltd., Publishers, New Delhi, 2002.
2. Hoffman. B, H. Lichtenegga and J. Collins, Global Positioning System - Theory and Practice, Springer -Verlag Publishers, 2001
3. Duggal S K, “Surveying (Vol – 1 & 2), Tata McGraw Hill Publishing Co. Ltd. New Delhi.
4. Surveying and levelling by R. Subramanian, Oxford university press, New Delhi

19CE2113: ENGINEERING GEOLOGY THEORY & PRACTICE

Course category:	Professional Core	Credits	3
Course type:	Theory	Lecture-Tutorial-practice	2-0-2
Pre requisites :	-	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives:

The objectives of the course are to give the basic knowledge of Geology that is required for constructing various Civil Engineering Structures, basic Geology, Geological Hazardous and Environmental Geology which gives a complete picture on the Geological aspects that are to be considered for the planning and construction of major Civil Engineering projects

Course Outcomes

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

- **Understand** weathering process and mass movement
- **Distinguish** geological formations
- **Identify** geological structures and processes for rock mass quality
- **Identify** subsurface information and groundwater potential sites through geophysical investigations
- **Apply** geological principles for mitigation of natural hazards and select sites for dams and tunnels

UNIT I GENERAL GEOLOGY.

Geology in Civil Engineering – Branches of geology – Earth structure and composition – Weathering – types and products – Geological work of Rivers, Wind and Sea – Seismic zones of India – Geophysical Methods – Seismic and Electrical Methods for Subsurface Investigation

UNIT II MINEROLOGY

Study of Physical properties of Minerals¹ – Study of Crystalline system² – Identification of different group of minerals: **Silica group**: Quartz, Amethyst, Opal; **Feldspar group**: Orthoclase, Plagioclase; **Cryptocrystalline group**: Jasper; **Carbonate group**: Calcite; **Element group**: Graphite; **Pyroxene group**: Talc; **Mica group**: Muscovite; **Amphibole group**: Asbestos, Olivine, Hornblende, Magnetite, Hematite, Corundum, Kyanite, Garnet, Galena, Gypsum.

UNIT III PETROLOGY

Classification of Rocks – Igneous, Sedimentary and Metamorphic Rocks – Identification of Rocks: **Igneous**: Granite and its varieties, Syenite, Rhyolite, Pumice, Obsidian, Scoria, Pegmatite, Volcanic Tuff. Basic rock: Gabbro, Dolerite, Basalt and its varieties, Trachyte. **Sedimentary**: Conglomerate, Breccia, Sandstone and its varieties, Laterite, Limestone and its varieties, Shales and its varieties. **Metamorphic**: Marble, slate, Gneiss and its varieties, Schist and its varieties. Quartzite, Phyllite.

UNIT IV STRUCTURAL GEOLOGY

Civil Engineering Importance of Folds, Faults, Unconformity and Joints relevance to civil engineering, Identification of features and study of structures from geological maps, problems on structural geology –Prospect of ground water

UNIT V ENGINEERING APPLICATIONS IN GEOLOGY

Geological consideration in construction of Dam, Tunnel, Secured Landfill -Earthquake, causes and Distribution in India – Tsunami – Remote Sensing for Civil Engineering Applications-Interpretation and drawing of sections for Geological Maps.

TEXT BOOKS:

1. Engineering Geology by N. Chennkesavulu, Mac-Millan, Publishers 2nd Edition India Ltd. 2010.
2. Principals of Engineering Geology by K.V.G.K Gokhale - B.S. Publications

REFERENCES:

1. Engineering Geology for Civil Engineering, P.C. Varghese, PHI Learning & private Limited.
2. Geology basics of Engineering by Aurele Parriaux, CRC press
3. Krynine & Judd, principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution.
4. F.G. Bell Fundamental of Engineering Geology Butterworths, Publications, New Delhi, 1992.
5. Engineering Geology by Subinoy Gangopadhyay, Oxford University press.

19CE2114: STRENGTH OF MATERIALS-I

Course category:	Basic Engineering	Credits	4
Course type:	Theory	Lecture-Tutorial-practice	3-1-0
Pre requisites :	Engineering Mechanics	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives:

The subject provide the knowledge of simple stress strains flexural stresses in members, shear stresses and deflection in beams so that the concepts can be applied to the Engineering problems.

Course Outcomes:

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

- **Analyze** the statically determinate and indeterminate problems.
- **Determine** the stresses and strains in the members subjected to axial, bending.
- **Evaluate** the slope and deflection of beams subjected to loads.
- **Determine** the principal stresses and strains in structural members

UNIT-1: SIMPLE STRESS AND STRAIN

Mechanical properties of engineering materials –Types of stresses and strains-Hooke's Law - stress and strain curves for Mild steel and typical engineering materials- Ductile and Brittle materials- working stress- factor of safety – Deformation of bars under axial load for prismatic and non prismatic bar- deformation due to its self weight – lateral strain- Poisson's ratio, volumetric strain- Elastic Moduli and the relation between them-composite bars – temperature stress – principle of complimentary shear

STRAIN ENERGY

Resilience, Proof Resilience, Modulus of Resilience - simple applications of strain energy due to Gradual, sudden and Impact loading

UNIT -2: SHEAR FORCE AND BENDING MOMENT

Definition of beam –Types of supports – Types of beams – concept of shear force and bending moment S.F and B.M diagram for cantilever , simply supported and over hanging beam subjected to point loads, UDL, uniformly varying loads, couples and combination of these loads – Point of contraflexure –Relation between S.F, B.M and loading.

UNIT -3: BENDING AND SHEAR STRESSES

Bending and shear stresses in beam: Assumptions in the theory of simple bending - Derivation of bending and shear equation-Neutral axis- Determination of bending and shear stresses – section modulus of rectangular and circular section (solid and Hollow) I,T and channel sections. Design of simple beam connection

UNIT-4: TORSION OF CIRCULAR SHAFTS

Theory of pure Torsion in solid and hollow circular shafts- Transmission of Power, combined torsion and bending with and without end thrust –Equivalent B.M and T.M SPRINGS: close and open coiled helical springs

UNIT-5: DEFLECTION OF BEAMS

Deflection of beams: Bending into a circular arc –slope under axial load and axial thrust. Carriage springs.deflection and Radius of curvature- Differential equation of deflected beam – Double integration method and Mecauly's method –Determination of slope and deflection for cantilever and simply supported beam, over hanging beam subjected to point loads, UDL and Varying loads. Mohr's theorem – Moment Area method- conjugate beam method.

TEXT BOOKS:

1. Strength of Materials by R. K. Bansal, Laxmi publications
2. Strength of Materials by S. Ramamrutham, Dhampat Rai & Co, New_ Delhi.

REFERENCE BOOKS:

1. Strength of Materials by F.L Singh and A.Y Pytal Horper & Row Publications.
2. Strength of Materials by D.S. Prakash Rao, Universities Press,Hyderabad
3. Strength of Materials by Bhavikatti.

19CE2115: BUILDING MATERIALS, CONSTRUCTION AND PLANNING

Course category:	Professional Core	Credits	3
Course type:	Theory	Lecture-Tutorial-practice	3-0-0
Pre requisites:	-	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives: The objectives of the course is to

- List the construction material.
- Explain different construction techniques
- Understand the building bye-laws
- Highlight the smart building materials

Course Outcomes: After the completion of the course student should be able to

- **Define** the Basic terminology that is used in the industry
- **Categorize** different building materials, properties and their uses
- **Understand** the Prevention of damage measures and good workmanship
- **Explain** different building services

UNIT I

Building Materials: Stone: as building material, Requirements of good quality stones, dressing of stones, deterioration and prevention of stone work. **Bricks:** Classification, Manufacturing, Requirements of good bricks, Field and laboratory tests on bricks, compressive strength, water absorption, efflorescence, dimension and warpage; cement concrete blocks, stabilized mud blocks, sizes, requirements of good blocks; **Mortar:** Types and requirements; **Timber:** wood, structure, types and properties, seasoning, defects: alternate materials for timber.

UNIT II

Foundation: Investigation of soil, Safe bearing capacity of soil, Functions and requirements of good foundation, types of foundation.

Masonry: Definition and terms used in masonry, Brick masonry, characteristics and requirements of good brick masonry, bonds in brick work; Stone masonry: requirements of good stone masonry, classification, characteristics of different stone masonry, joints in stone masonry; Walls, types of walls, cavity walls.

UNIT-III

Lintels and Arches: Definition, function and classification of lintels, Balconies, Chejja and Canopy; Arches: Elements, types and stability of an arch.

Floors and Roofs: Floors: Requirements of good floor, components of ground floor, selection of floor material, laying of concrete, Mosaic, Marble, Granite, Tile flooring, cladding of tiles. Roof: requirements of good roof, elements of a pitched roof, Trussed roof, King post Truss, Queen post truss, Different roofing material, RCC roof.

UNIT IV

Doors, Windows and Ventilators: Location of doors and windows, technical terms, materials for door, Panelled door, flush door, collapsible door, rolling shutter terms, PVP Door, Panelled and glazed window, bay window, French window. Ventilator: sizes as per IS recommendations.

Stairs: Definitions, technical terms and type of stairs, Requirements of good stairs, Geometrical design of RCC doglegged and open well stairs.

UNIT V

Finishing: Purpose, materials and methods of plastering and pointing, defect in plastic-stucco plastering, lathe plastering.

Damp Proofing: Purpose, types, ingredients and defects, preparation and applications of paints to new and old plastered surfaces, wooden and steel surfaces.

Building Services: Plumbing services, water distribution, sanitary, lines and fittings; Air Conditioning: essentials and types. Acoustic; Fire Hazards and fire protection.

Text Books:

1. Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications.
2. Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi.

Reference Books:

1. Building Materials by Duggal, New Age International.
2. Building Materials by P. C. Varghese, PHI.
3. Building Construction by PC Varghese PHI.
4. Construction Technology – Vol – I & II by R. Chubby, Longman UK.
5. Alternate Building Materials and Technology, Jagadish, Venkatarama Reddy and others; New Age Publications.

19CE2151: ENGINEERING SURVEYING LAB

Course category:	Professional core	Credits	1.5
Course type:	Practical	Lecture-Tutorial-practice	0-0-3
Pre requisites :	Surveying	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives:

- To impart the practical knowledge in the field- measuring distances, directions, angles,
- To determining R.L.'s areas and volumes
- To set out Curves
- To stake out points
- To traverse the area
- To draw Plans and Maps

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

- **Apply** the principle of surveying for civil Engineering Applications
- **Calculation** of areas, **Drawing** plans and contour maps using different measuring equipment at field level
- **Write** a technical laboratory report

List of Experiments

1. Chaining of a line using Chain/Tape and Recording of details along the chain line.
2. Measurement of area – Cross staff survey.
3. Determine of distance between two inaccessible points with compass.
4. Traversing by compass and graphical adjustment.
5. Radiation method, intersection methods by plane table survey.
6. Measurement of horizontal and vertical angles using theodolite .
7. Trigonometric leveling using Theodolite
8. Height and distances using principles of tachometric surveying
9. Measurement of elevation difference between two points using any leveling Instrument (Differential Levelling).
10. Elevation difference between two points by Reciprocal leveling Method.
11. Profile Levelling – Plotting of Profile.
12. Contouring of a small area by method of Blocks.

E-Reference:

<http://gauravtandon.wikspacaes.com>

19CE2152: STRENGTH OF MATERIALS LAB

Course category:	Professional core	Credits	1.5
Course type:	Practical	Lecture-Tutorial-practice	0-0-3
Pre requisites:	Strength of materials and Engineering mechanics	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives: The objective of the course is to make the student understand the behavior of materials under different types of loading for different types structures

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

- **Conduct** tension test on Materials like steel etc.
- **Conduct** compression tests on spring, wood and concrete
- **Conduct** flexural and torsion test to determine elastic constants
- **Determine** hardness of metals

List of Experiments:

1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Izod Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.

19CE2153: COMPUTER AIDED DRAFTING OF BUILDINGS LAB

Course category:	Professional core	Credits	2
Course type:	Practical	Lecture-Tutorial-practice	0-0-4
Pre requisites:		Continuous evaluation:	30
		Semester end evaluation:	70
		Total Marks:	100

Course Objectives:The objective of this lab is to teach the student basic coding and drafting fundamentals in various civil engineering applications, specially in building drawing.

Course Outcomes:At the end of the course, the student will be able to: Apply basic MATLAB commands and Master the usage of Autocad commands for drawing 2D & 3D building drawings required for different civil engg applications.

List of Experiments

1. Introduction to MATLAB
2. Basic Operations using MATLAB
3. Solving Linear equations using MATLAB
4. Working with Matrices using MATLAB
5. Introduction to computer aided drafting
6. Software for CAD – Introduction to different softwares
7. Practice exercises on CAD software
8. Drawing of plans of buildings using software
 - a. Single storied buildings
 - b) multi storied buildings
9. Developing sections and elevations for
 - a. Single storied buildings
 - b) multi storied buildings
10. Detailing of building components like Doors, Windows, Roof Trusses etc. using CAD Softwares
11. Exercises on development of working drawings of buildings

TEXT BOOKS:

1. Computer Aided Design Laboratory by M. N. Sessa Praksh & Dr. G. S. Servesh – Laxmi Publications.
2. Engineering Graphics by P. J. Sha – S. Chand & Co.

19MC0001:GENDER SENSITIZATION

Course category:	Mandatory course	Credits	0
Course type:	Theory	Lecture-Tutorial-practice	2-0-0
Pre requisites :	Engineering Mechanics, Strength of materials I	Continuous evaluation: Semester end evaluation: Total Marks:	

COURSE DESCRIPTION

This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality.

This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender-based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

Objectives of the Course

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Learning Outcomes

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics. Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

UNIT-I:

UNDERSTANDING GENDER

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste.

UNIT – II: GENDER ROLES AND RELATIONS

Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles-Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences- Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary

UNIT – III: GENDER AND LABOUR

Division and Valuation of Labour-Housework: The Invisible Labor- “My Mother doesn’t Work.” “Share the Load.”-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work. -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming

UNIT – IV: GENDER - BASED VIOLENCE

The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective-Sexual Harassment: Say No!-Sexual Harassment, not Eveteasing- Coping with Everyday Harassment- Further Reading: “Chupulu”.

Domestic Violence: Speaking Out Is Home a Safe Place? -When Women Unite [Film].

Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-“I Fought for my Life....”

UNIT – V: GENDER AND CULTURE

Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks-The Brave Heart.

19CE2211: STRENGTH OF MATERIALS-II

Course category:	Professional Core	Credits	3
Course type:	Theory	Lecture-Tutorial-practice	3-0-0
Pre requisites :	Engineering Mechanics, Strength of Materials I	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives: Study of the subject provides the understanding of principal stress, strains, springs, columns, and structures.

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

- **Determine** stresses in the member subjected to Torsion
- **Analyze** columns and struts
- **Understand** the concept of direct and bending stresses
- **Analyze and design** springs, thin and thick cylinders
- **Understand** the concept of unsymmetrical bending.

UNIT-1: PRINCIPAL STRESSES AND STRAINS: Introduction-Stresses on an inclined section of a bar under axial loading- compound stresses- Normal and tangential stresses on an inclined plane for Biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear –Mohr’s circle of stresses –principle stresses and strains- An analytical and graphical solutions .

Theories of Failure: Introduction – Various theories of failure - Maximum Principal Stress Theory, Maximum Principal Strain Theory, Maximum shear stress theory- Strain Energy and Shear Strain Energy Theory (Von Mises Theory).

UNIT-2: COLUMNS AND STUTS: Introduction- Types of columns –short, Medium, Long columns-Axially loaded compression member- Crushing load- Euler’s theorem for long columns- assumptions- Derivation of Euler’s critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler’s critical stress –Limitations of Euler’s theory – Rankine – Gordon formula – Long columns subjected to eccentric loading – Secant formula – Empirical formulae – Straight line formula – Prof. Perry’s formula.

Laterally loaded struts – subjected to UDL and concentrated loads – Maximum B.M. and stress due to transverse and lateral loading.

UNIT-3: DIRECT AND BENDING STRESSES: Distribution of stresses over symmetrical section under combined axial load and Bending moment. cores of solid and hollow circular and rectangular section. Determination of stresses in the case of retaining walls, chimneys and dams – conditions for stability-Overturning and sliding.

UNIT-4: THIN AND THICK CYLINDERS AND SHELLS

Thin cylinders: Thin seamless cylindrical shells- Derivation of formula for longitudinal and circumferential stress- Hoop, longitudinal and volumetric strain.

Thick cylinders: Lamé’s theory for thick cylinders– Derivation of Lamé’s formulae – distribution of hoop and radial stresses across thickness- Design of thick cylinders – compound cylinders.

Thin and Thick spherical shells.

UNIT-5: UNSYMMETRICAL BENDING:

Introduction – Centroidal principal axes of section – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis.

SHEAR CENTRE: Introduction - Shear centre for symmetrical and unsymmetrical (channel, I, T and L) sections

Text Books:

1. Theory of structures by B.C. Punmia Ashok Kumar Jain, Laxmi Publications.
2. Strength of materials-II by S.S.Bhavikatti

References Books :

1. Strength of materials G.H Ryder Macmillan India limited Delhi
2. Graphical methods in Structural Analysis by D.S.Prakash Rao Universities Press.Hyderabad.
3. Mechanics of Structures by S.B Junnarkar Charotar Publications House
4. Theory of structures by Mahadevappa.

19CE2212:FLUID MECHANICS & HYDRAULIC MACHINERY

Course category:	Professional core	Credits	4
Course type:	Theory	Lecture-Tutorial-practice	3-1-0
Pre requisites:	Mathematics and physics	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives: The objectives of the course are to

- Introduce the concepts of fluid mechanics useful in Civil Engineering applications
- To obtain the velocity and pressure variations in various types of simple flows
- To prepare a student to build a good fundamental background useful in the application intensive courses covering hydraulics, hydraulic machinery and hydrology
- To Define the fundamental principles of water conveyance in open channels.
- To Discuss and analyze the open channels in uniform and Non-uniform flow conditions.
- To Study the characteristics of hydroelectric power plant and its components.
- To analyze and design of hydraulic machinery and its modeling

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

- **Understand** the principles of fluid statics, kinematics and dynamics
- **Apply** Continuity, Momentum and Energy Principles
- **Understand** the importance of dimensional analysis
- **Understand** the working of various types of hydraulic machines like pumps and turbines.

UNIT I: FLUID PROPERTIES AND FLOW CHARACTERISTICS

Definition- Properties of fluids- mass density, specific weight, specific gravity, viscosity, surface tension and capillarity, Hydrostatic forces on vertical, horizontal, inclined and curved surfaces. Flow characteristics –Types of flows, flownets, rate of flow, continuity equation, Bernoulli's theorem, momentum equation and their applications.

UNIT II: FLOW MEASUREMENTS AND BOUNDARY LAYER THEORY

Flow through notches and weirs, orifices and mouthpieces, hydraulic coefficients, Reynold's number, Major and minor losses in pipes, pipes in series, equivalent pipe, pipes in parallel, power transmission, water hammer in pipes. Boundary Layer theory-concept, characteristics of BL on a flat plate, different thicknesses related to BL, Separation and Control.

UNIT III: OPEN CHANNEL FLOW AND DIMENSIONAL ANALYSIS

Introduction, classification of open channels, classification of open channel flows, Chezy's, Manning's and Bazin's formulae for uniform flow, Most economical sections. Dimensional analysis – methods of dimensional analysis, similitude and its types, dimensionless parameters and its application, model analysis.

UNIT IV: BASICS OF TURBO MACHINERY AND HYDRAULIC TURBINES

Hydro dynamic force of jets on stationary and moving plates, velocity triangles, elements of a hydroelectric power plant, classification of turbines, heads and efficiencies, Pelton wheel, Francis and Kaplan turbines, working principles, draft tube. Specific speed, unit quantities and governing of turbines.

UNIT V: CENTRIFUGAL AND RECIPROCATING PUMPS:

Centrifugal Pumps-Classification, heads and efficiencies, minimum starting speed, specific speed, multi stage pumps, pumps in series, pumps in parallel, NPSH, priming, Characteristic curves, hydraulic machines subjected to cavitation, effects and precautions. Reciprocating pumps-parts, working, slip, classification.

Text Books :

1. Fluid Mechanics and Hydraulic Machines by Dr.R.K. Bansal, Laxmi Publications 2015
2. Fluid Mechanics and Hydraulic Machines by Modi and Seth, Standard Book House

Reference Books :

1. Streeter, V. L. and Wylie E. B., "Fluid Mechanics", McGraw Hill Publishing Co. 2010
2. Open channel flow by V.T. Chow (McGraw Hill Book Company)
3. Hydraulic Machines by Banga & Sharma (Khanna Publishers)

19CE2213: STRUCTURAL ANALYSIS

Course category:	Professional core	Credits	4
Course type:	Theory	Lecture-Tutorial-practice	3-1-0
Pre requisites:	SM-I, SM-II	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives: To make the students to understand the principles of analysis of structures subjected to static and moving loads by various methods.

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

- **Analyze** Perfect, Imperfect And Redundant Frames
- **Formulate** Equilibrium and compatibility equations for structural members
- **Analyze** one dimensional and two dimensional problems using classical methods
- **Analyze** indeterminate structures
- **Analyze** structures for gravity loads, moving loads and lateral loads

UNIT – I

INTRODUCTION TO INDETERMINATE STRUCTURES

Equilibrium and compatibility equations -types of supports and reactions, types of joints and equilibrium equations, Static and kinematic indeterminacies of beams and frames. Effect of force releases like moment hinge, shear releases, link on static indeterminacy, Relative Merits of indeterminate structures over determinate structures.

ANALYSIS OF PERFECT FRAMES

Types of frames - Perfect, Imperfect and Redundant pin jointed plane frames - Analysis of determinate pin jointed plane frames using method of joints, method of sections and tension coefficient method for vertical loads, horizontal loads and inclined loads.

UNIT – II

ENERGY THEOREMS

Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces - Castigliano's theorem-Unit Load Method - Deflections of simple beams and pin-jointed plane frames - Deflections of statically determinate bent frames.

TWO AND THREE HINGED ARCHES

Introduction – Types of Arches – Comparison between Three hinged and Two hinged Arches - Linear Arch - Eddy's theorem - Analysis of Two hinged arches- Analysis of Three hinged arches – Normal Thrust and radial shear and bending moment - Geometrical properties of parabolic and circular arches - Three hinged parabolic circular arches having supports at different levels.

UNIT – III

PROPPED CANTILEVER, FIXED AND CONTINUOUS BEAMS

Method of consistent deformation, Analysis of Propped cantilever and fixed beams, subjected to uniformly distributed load, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads – Shear force and Bending moment diagrams for Propped Cantilever and Fixed Beams-Deflection of Propped cantilever and fixed beams; effect of sinking of support, effect of rotation of a support.

UNIT – IV

SLOPE DEFLECTION METHOD AND MOMENT DISTRIBUTION METHOD

Derivation of slope-deflection equation, application to continuous beams with and without settlement of supports. Shear force and bending moment diagrams and Elastic curve. Moment Distribution Method: application to continuous beams with and without settlement of supports. Shear force and bending moment diagrams.

UNIT – V

MOVING LOADS AND INFLUENCE LINES

Introduction-applications to bridges (only description), Definition of influence line for SF, Influence line for BM- load position for maximum SF at a section-Load position for maximum BM at a section – Point loads, UDL longer than the span, UDL shorter than the span-maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load UDL longer than the span, UDL shorter than the span, several point loads Equivalent uniformly distributed load-Influence line diagrams for trusses like Pratt and Warren trusses. Equivalent uniformly distributed load. Focal length. Muller Breslau's principle for determinate and indeterminate beams (qualitative)

TEXT BOOKS:

1. Structural Analysis Vol –I & II by V. N. Vazirani and M. M. Ratwani, Khanna Publishers.
2. Structural Analysis Vol I & II by G. S. Pandit and S. P. Gupta, Tata McGraw Hill Education Pvt. Ltd.
3. Mechanics of Structures Vol – I and II by H. J. Shah and S. B. Junnarkar, Charotar Publishing House Pvt. Ltd.

REFERENCES:

1. Structural Analysis by R. C. Hibbeler, Pearson Education
2. Structural Analysis by Devdas Menon, Narosa Publishing House.
3. Basic Structural Analysis by C. S. Reddy., Tata McGraw Hill Education Pvt. Ltd.
4. Fundamentals of Structural Analysis by M. L. Gamhir, PHI Learning Pvt. Ltd
5. Structural Analysis -I by S. S. Bhavikatti, Vikas Publishing House Pvt. Ltd.

19EE2217: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Course category:	Professional core	Credits	3
Course type:	Theory	Lecture-Tutorial-practice	3-0-0
Pre requisites:	Mathematics and physics	Continuous evaluation:	30
		Semester end evaluation:	70
		Total Marks:	100

Course Objectives:

- To introduce the concepts of electrical circuits and its components
- To understand magnetic circuits, DC circuits and three phase circuits
- To study and understand the different types of DC/AC machines and Transformers.
- To impart the knowledge of various electrical installations.
- To introduce the concepts of diodes & transistors, and
- To impart the knowledge of various configurations, characteristics and applications.

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

- **Analyze** and solve electrical circuits using network laws and theorems.
- **Understand** and **analyze** basic Electric and Magnetic circuits
- **Study** the working principles of Electrical Machines
- **Introduce** components of Low Voltage Electrical Installations
- **Identify and characterize** diodes and various types of transistors.

UNIT - I:

D.C. CIRCUITS: Ohm's law, Electrical circuit elements, voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation.

A.C. CIRCUITS: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Three-phase balanced circuits, star-Delta connections.

UNIT - II:

ELECTRICAL INSTALLATIONS: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, MCCB, ELCB, Types of Wires and Cables, Earthing, Elementary calculations for energy consumption, power factor improvement.

UNIT - III:

ELECTRICAL MACHINES: Construction and Working principle of Single-phase transformer, losses in transformers, efficiency, Three-phase transformer connections. Construction and working principle of DC generators, EMF equation, working principle of DC motors, Torque equations and Speed control of DC motors, Construction and working of Three-phase Induction motor, Torques equation, working principle of synchronous generators.

UNIT - IV:

P-N JUNCTION AND ZENER DIODE: Principle of Operation Diode equation, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Zener diode characteristics and applications.

RECTIFIERS AND FILTERS: P-N junction as a rectifier - Half Wave Rectifier, Ripple Factor - Full Wave Rectifier, Bridge Rectifier, Inductor Filters, Capacitor Filters.

UNIT - V:

BIPOLAR JUNCTION TRANSISTOR (BJT): Construction, Principle of Operation, Amplifying Action, Common Emitter, Common Base and Common Collector configurations, Comparison of CE, CB and CC configurations.

JUNCTION FIELD EFFECT TRANSISTOR (JFET): Construction, Principle of Operation, Comparison of BJT and JFET.

TEXT BOOKS:

1. Basic Electrical and electronics Engineering –M S Sukija TK Nagasarkar Oxford University
2. Basic Electrical and electronics Engineering-D P Kothari. I J Nagarath, McGraw Hill Education

REFERENCES:

1. Basic Electrical and electronics Engineering-Dr.Ramana pillai,Dr.M.Suryakalavathi & G.T. Chandrashekar-S Chand Publications.
2. Electronic Devices and Circuits – R. L. Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
3. Millman's Electronic Devices and Circuits – J. Millman and C. C. Halkias, Satyabrata Jit, TMH, 2/e, 1998.
4. Engineering circuit analysis- by William Hayt and Jack E. Kemmerly, McGraw Hill Company, 6th edition.
5. Linear circuit analysis (time domain phasor and Laplace transform approaches) - 2nd edition by Raymond A. De Carlo and Pen-Min-Lin, Oxford University Press-2004.
6. Network Theory by N. C. Jagan& C. Lakshminarayana, B.S. Publications.
7. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.
8. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
9. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
10. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

19CE2215: WATER RESOURCE ENGINEERING

Course category:	Professional subject core	Credits	3
Course type:	Theory	Lecture-Tutorial-practice	3-0-0
Pre requisites:		Continuous evaluation:	30
		Semester end evaluation:	70
		Total Marks:	100

Course Objectives: The objectives of the course is to study the concepts of

- Engineering Hydrology and its applications like Runoff estimation, estimation of design discharge and flood routing.
- Irrigation Engineering – Water utilization for crop growth and their designs.

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

- **Analyze** hydro-meteorological data
- **Estimate** abstractions from precipitation
- **Compute** yield from surface and subsurface basin
- **Develop** rainfall-runoff models
- **Formulate** and solve hydrologic flood routing models
- **Estimate** runoff, design discharge from catchment

UNIT - I:

Introduction to engineering hydrology and its applications, Hydrologic cycle, types and forms of precipitation, rainfall measurement, types of rain gauges, computation of average rainfall over a basin, processing of rainfall data - Adjustment of record - Rainfall Double Mass Curve. Runoff- Factors affecting Runoff - Runoff over a Catchment - Empirical and Rational Formulae.

Abstraction from rainfall-evaporation, factors affecting evaporation, measurement of evaporation- Evapotranspiration- Penman and Blaney & Criddle Methods - Infiltration, factors affecting infiltration, measurement of infiltration, infiltration indices.

UNIT - II:

Distribution of Runoff - Hydrograph Analysis Flood Hydrography - Effective Rainfall - Base Flow - Base Flow Separation - Direct Runoff Hydrograph - Unit Hydrograph, definition, and limitations of applications of Unit hydrograph, derivation of Unit Hydrograph from Direct Runoff Hydrograph and vice versa - S-hydrograph, Synthetic Unit Hydrograph.

UNIT - III:

Ground water Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissivity and storage coefficient, Darcy's law, radial flow to wells in confined and unconfined aquifers. Types of well's, Well Construction - Well Development.

UNIT - IV:

Necessity and Importance of Irrigation, advantages and ill effects of irrigation, types of Irrigation, methods of application of Irrigation water, Indian agricultural soils, methods of improving soil fertility - Crop Rotation, preparation of land for Irrigation, standards of quality for Irrigation water.

Soil-water-plant relationship, vertical distribution of soil moisture, soil moisture constants, soil moisture tension, consumptive use, Duty and delta, factors affecting duty- Design discharge for a water course. Depth and frequency of Irrigation, irrigation efficiencies-Water Logging.

UNIT - V:

Classification of canals, Design of Irrigation canals by Kennedy's and Lacey's theories, balancing depth of cutting, IS standard for a canal design canal lining. Design Discharge over a catchment, Computation of design discharge rational formula, SCS curve number method, flood frequency analysis- Introductory Part Only. Stream Gauging - measurement and estimation of stream flow.

TEXT BOOKS:

1. Engineering hydrology by Jayram Reddy, Laxmi publications pvt. Ltd., New Delhi.
2. Irrigation and water power engineering by Punmia & Lal, Laxmi publications pvt. Ltd., New Delhi.

REFERENCES:

1. Elementary hydrology by V. P. Singh, PHI publications.
2. Irrigation and Water Resources & Water Power by P. N. Modi, Standard Book House.
3. Water Resources Engineering - I by Dr. G. Venkata Ramana, Academic Publishing Company.
4. Irrigation Water Management by D. K. Manjundar, Printice Hall of India.
5. Irrigation and Hydraulic structures by S. K. Grag.
6. Applied hydrology by Ven Te Chow, David R. Maidment larry W. Mays Tata Mc. Graw Hill.
7. Introduction to hydrology by Warren Viessvann, Jr, Garyl. Lewis, PHI.

19CE2251:FLUID MECHANICS & HYDRAULIC MACHINERY LAB

Course category:	Professional core	Credits	1.5
Course type:	Practical	Lecture-Tutorial-practice	0-0-3
Pre requisites:	FM theory	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives: To give the student an exposure to various pipe flows, flow measuring devices and hydraulic machines

Course Outcomes: At the end of the course, the student will have demonstrative ability to:

- Calibrate various flow measuring devices like notches, Venturimeter, mouthpiece etc
- Determine major and minor losses in a pipe flow
- Discover the practical working of various hydraulic machines like turbines and pumps

List of Experiments:

1. Verification of Bernoulli's equation
2. Determination of Coefficient of discharge for a small orifice/mouthpiece by a constant head method
3. Calibration of Venturimeter / Orifice Meter
4. Calibration of Triangular / Rectangular/Trapezoidal Notch
5. Determination of Friction factor of a pipe line (Major losses)
6. Determination of Minor losses in pipe flow
7. Determination of Manning's and Chezy's constants for Open channel flow
8. Impact of jet on vanes
9. Performance Characteristics of Pelton wheel turbine
10. Performance Characteristics of Francis turbine
11. Performance characteristics of Kaplan Turbine
12. Performance Characteristics of a single stage / multi stage Centrifugal Pump

19EE2257: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

Course category:	Professional Core	Credits	1.5
Course type:	Practical	Lecture-Tutorial-practice	0-0-3
Pre requisites:	Basic Electrical and Electronics Engineering	Continuous evaluation: Semester end evaluation: Total Marks:	30 70 100

Course Objectives:

- To introduce the concepts of electrical circuits and its components
- To understand magnetic circuits, DC circuits and AC single phase & three phase circuits
- To study and understand the different types of DC/AC machines and Transformers.
- To impart the knowledge of various electrical installations.
- To introduce the concept of power, power factor and its improvement.
- To introduce the concepts of diodes & transistors, and
- To impart the knowledge of various configurations, characteristics and applications.

Course Outcomes:

- To analyze and solve electrical circuits using network laws and theorems.
- To understand and analyze basic Electric and Magnetic circuits
- To study the working principles of Electrical Machines
- To introduce components of Low Voltage Electrical Installations
- To identify and characterize diodes and various types of transistors.

List of experiments/demonstrations: Five Experiments from each Part are Compulsory.

PART A: ELECTRICAL

1. Verification of KVL and KCL
2. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer
3. Measurement of Active and Reactive Power in a balanced Three-phase circuit
4. Performance Characteristics of a DC Shunt Motor
5. Performance Characteristics of a Three-phase Induction Motor
6. No-Load Characteristics of a Three-phase Alternator

PART B: ELECTRONICS

1. Study and operation of
(i) Multi-meters (ii) Function Generator (iii) Regulated Power Supplies (iv) CRO.
2. PN Junction diode characteristics
3. Zener diode characteristics and Zener as voltage Regulator
4. Input & Output characteristics of Transistor in CB / CE configuration
5. Full Wave Rectifier with & without filters.
6. Input and Output characteristics of FET in CS configuration

Additional Experiments:

1. OC and SC Test on Single Phase Transformer.

2. Verification of ohm's law.

TEXT BOOKS:

1. Basic Electrical and electronics Engineering –M S Sukija TK Nagasarkar
Oxford University
2. Basic Electrical and electronics Engineering-D P Kothari. I J Nagarath,
McGraw Hill Education

REFERENCES:

1. Electronic Devices and Circuits – R. L. Boylestead and Louis Nashelsky,
PEI/PHI, 9th Ed, 2006.
2. Millman's Electronic Devices and Circuits – J. Millman and C. C. Halkias,
Satyabrata Jit, TMH, 2/e, 1998.
3. Engineering circuit analysis- by William Hayt and Jack E. Kemmerly,
McGraw Hill Company, 6th edition.
4. Linear circuit analysis (time domain phasor and Laplace transform
approaches) - 2nd edition by Raymond A. De Carlo and Pen-Min-Lin, Oxford
University Press-2004.
5. Network Theory by N. C. Jagan& C. Lakshminarayana, B.S. Publications.
6. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.
7. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University
Press, 2011.
8. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
9. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

19HS2251: SOFT SKILLS LAB

Course category:	HS	Credits	1
Course type:	Practical	Lecture-Tutorial-practice	0-0-3
Pre requisites:		Continuous evaluation:	30
		Semester end evaluation:	70
		Total Marks:	100

Objectives

- To enable the students to improve their language ability in terms of LSRW skills.
- To make the students understand the importance of language efficiency in the spirit of competence.
- To make them discern how to convert their potential into better performance through language.
- To enable the students to improve their writing skills.
- To fine tune their writing and speaking skills thereby making them employable.
- To make the students understand the essence of soft skills.
- To make them realize how soft skills and language go together.
- To enable the students understand how soft skills play a vital role in the pursuit of their career.
- To improve their aptitude and attitude through Language and Soft Skills.
- To transform the students into better performers.

UNIT 1

I. Essay: A Better Anti-Poverty Plan for India (Source: Internet)

i. Vocabulary- Word Formation

ii. Grammar- Nouns and Pronouns

II. Soft Skills: Art of Communication- Interpersonal Communication- Intra-personal Communication

UNIT 2

I. Essay: Are our Graduates Unemployable? Examination of the Quality of Indian Education (Source: Internet)

i. Vocabulary- Types of Vocabulary

ii. Grammar- Verbs and Adverbs- Tenses

II. Soft Skills: Punctuality- Discipline- Behaviour- Attitude- Ills of Procrastination

UNIT 3

I. Essay: The Idea of India: Romila Thapar and Gayatri Chakraborty Spivak in Conversation- History for Peace. (Source: Internet)

i. Vocabulary- Origin of words- Foreign words

ii. Grammar- Adjectives and Prepositions- Types of Sentences- Assertive, Interrogative, Imperative and Exclamatory

II. Soft Skills: Motivation- Affinity- Cooperation- Coordination- Team Building

UNIT 4

I. Essay: A Speech by Javed Akhtar on Spirituality. (Source: Internet)

i. Vocabulary- One-word substitutes- Synonyms and Antonyms- Homonyms, Homophones and Homographs

ii. Grammar- Conjunctions and Interjections- Structure of Sentences- Simple, Compound and Complex Sentences

II. Soft Skills: Leadership-Organization- Self confidence- Trust Building and Problem Solving

UNIT 5

I. Essay: Arundhathi Roy's Explanation on How Corporates Run Indian Politics and Economy. (Source: Internet)

I. Vocabulary- Compound Words- Idioms and Phrases

ii. Grammar- Letter Writing- Resume Writing- Report Writing

II. Soft Skills: Stress Management- Emotional Intelligence- Ethical Behaviour- Goal Setting

References

1. Green, David. *Contemporary English Grammar Structure and Composition*. New Delhi: Trinity Press Pvt. Ltd, (2nd Edition), 2015.
2. Raju, Yadava B, B T Sujatha & C, Murali Krishna. *English for Better Performance*, Orient Blackswan, Pvt.,Ltd, 2014.
3. Tulgan, Bruce. *Bridging the Soft Skills Gap- How to Teach the Missing Basics to Today's Young Talent*. Jossey-Bass; 1 edition. September 15, 2015.
4. Rajan. *I Love Living*. Mumbai: Jaico Publishers, 2013