Vision of the Institute

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

Mission of the Institute

- To expand the frontiers of knowledge through Quality Education.
- To provide valued added Research and Development.
- To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional Behavior.

Vision of Civil Department

To give the nation qualitative Civil Engineers, who can contribute for the construction of a better world with sophisticated infrastructural facilities, eco-friendly houses, modern transportation facilities with a pollution free environment and to protect the precious natural resources of this planet.

Mission of Civil Department

- To shape the students into good entrepreneurs and to promote self-confidence and all-round development of the student personality through special lectures, practical training programs, field visits and technical seminars.
- To train the students to acquire generic knowledge in the areas of Civil Engineering
- To continuously update the physical infrastructure through modernization, thrust area development, R & D and other schemes
- To generate knowledge base through sustained research and developmental efforts.
- To produce engineers with self-confidence and overall personality who can be self-employed and generate employment opportunities to fellow engineers and take active part in nation building, keeping in view the challenges of the future

Program Educational Objectives (PEO's of Civil Department)

1. The main objective of the faculty is to guide them by the principles of sustainable development and global inter connectedness with the CIVIL structures, and make them to understand the impact of CIVIL engineering projects how they effects society and environment in case of failures.
2. To develop their Communication skills (Oral, Written and Visual, Graphic modes) which makes them to participate actively in their Communities and Profession when working as team leaders or members.
3. An intensive training is provided to identify, formulate and solving engineering problems in technical areas appropriate to CIVIL ENGINEERING.
4. To make them competent and engaged engineering professionals applying their technical & managerial skills in Planning, Designing and Construction.

Program Outcomes(PO's) of Civil Department

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics,
natural sciences, and engineering sciences.
3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Recognize the need for, and have the preparation and ability to engage in
independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes(PSO's) of Civil Department

1. An ability to learn constructional concepts and to implement them in the field work and to make the structural

   planning in a smarter way.

2. To encourage young energetic engineers in technical and software skills in the field of Civil Engineering with

   innovative thoughts along with existing and future trends in constructional field.

3. The capability to integrate knowledge in constructional field work and to improve skills to become an entrepreneur.

II Year - II Semester

S.No	Category	Course Title	L	T	P	C	IM	EM	TM
1	BSC	M- IV (Numerical methods and Probability & Statistics)	3	-	-	3	30	70	100
2	PCC	Strength of Materials -II	3	-	-	3	30	70	100
3	PCC	Hydraulics and Hydraulic Machinery	3	-	-	3	30	70	100
4	ESC/PCC	Environmental Engineering	3	-	-	3	30	70	100
5	HSMC	Understanding Harmony	3	-	-	3	30	70	100
6	ESC/ PCC LAB	Environmental Engineering Laboratory	-	-	3	1.5	15	35	50
7	PCC LAB	Strength of Materials Laboratory	-	-	3	1.5	15	35	50
8	PCC LAB	Fluid Mechanics & Hydraulics Machinery Laboratory	-	-	3	1.5	15	35	50
9	SOC	Advanced Construction Planning Laboratory	-	-	4	2	15	35	50
10	MC	Critical Reading and Creative Writing	2	-	-	-	-	-	-
Total			**17**	**0**	**13**	**21.5**	**210**	**490**	**700**
Internship 2 Months (Mandatory) during summer vacation									
Honors/Minor courses			**3**	**1**	**0**	**4**			

Subject	Mathematics-IV(Numerical Methods, Probability &Statistics)			
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	3	0	0	3

Course Objectives:

To enable the students to

1. Know the standard numerical methods to find roots of functions in practical engineering problems and identify the concepts of interpolation, to estimate the unknown functional values.
2. Identify the methods for finding the values of derivatives and finite integrals using numerical techniques.
3. Understand various statistical distributions
4. Decide the null or alternative hypotheses using the suitable test statistic

SYLLABUS

UNIT - I

Solution of Algebraic and Transcendental Equations & Interpolation: Introduction- algebraic function and transcendental function - Bisection method, Regula –Falsi Method, Iteration Method, Newton- Raphson method.

Introduction, Finite Differences, Forward, Backward and Central Differences - Newton"s forward and backward formulae –Gauss"s forward and backward interpolation formulae - Lagrange"s Interpolation Formula.

Numerical Integration and Solution of Ordinary Differential Equations: Numerical Integration-Trapezoidal rule – Simpson"s $1/3^{rd}$ Rule –Simpson"s $3/8^{th}$ Rule.

Solution by Taylor"s method, Euler"s & Modified Euler"s method, Runge- Kutta Method (4th order)

UNIT - III

Probability Distributions: Basic concepts on probability, random variables (discrete and continuous)**,** probability distribution- Binomial, Poisson and Normal distributions and their properties

UNIT - IV

Sampling Theory: Introduction – Population and samples – Sampling distribution of Means and Variance (definition only) – Central limit theorem (without proof) – Introduction to t, χ^2 and F distributions – Point and Interval estimations – Maximum error of estimate.

UNIT - V

Tests of Hypothesis: Introduction – Hypothesis – Null and Alternative Hypothesis – Type I and Type II errors – Level of significance – One tail and two-tail tests – Tests concerning one mean and two means (Large and Small samples) – Tests on proportions.

Text Books:
1. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, reprint, 2008.
2. B. V. Ramana, Engineering Mathematics, 4th Ed., Tata McGraw Hill, New Delhi, 2009
3. S.C. Gupta, V.K. Kapoor Fundamentals of Mathematical Statistics a Modern Approach, 10th Edition 2000

References:
1. T.K.V.Iyengar, B. Krishna Ghandhi, S. Ranganathan and M.V.S.S.N.Prasad, Engineering Mathematics, Volume-I, 12th Ed., S. Chand Publishers, 2014
2. S.S.Sastry, Introductory methods of Numerical Analysis, Prentice Hall of India Pvt. Ltd., 4th Ed., 2006

Course Outcomes:
After undergoing this course, students will be able to
1. Apply standard numerical methods to solve fundamental and practical engineering problems and understand the concepts of interpolation to estimate the unknown functional values.
2. Evaluate finite integrals and solving differential equations using numerical techniques
3. Understand the discrete and continuous probability distributions and apply relevant engineering problems
4. Perform inferential statistics to test hypothesis for large sample
5. Apply the concept of testing hypothesis for small samples to draw the inferences and estimate the goodness of fit.

Subject	STRENGTH OF MATERIALS - II			
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	3	0	0	3

Course Objectives:
1. To give concepts of Principal stresses and strains developed in cross section of the beams on the cross section and stresses on any inclined plane. To impart concepts of failures in the material considering different theories
2. To give concepts of torsion and governing torsion equation, and there by calculate the power transmitted by shafts and springs and design the cross section when subjected to loading using different theories of failures.
3. To classify columns and calculation of load carrying capacity and to assess stresses due to axial and lateral loads for different edge conditions and to calculate combined effect of direct and bending stresses on different engineering structures.
4. Introduce the concept of unsymmetrical bending in beams Location of neutral axis Deflection of beams under unsymmetrical bending.

SYLLABUS

UNIT - I
Principal Stresses and Strains and Theories of Failures: 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 – Principal stresses and strains – Analytical and graphical solutions.

UNIT – II
Torsion of Circular Shafts and Springs: Theory of pure torsion – Derivation of Torsion equations: $T/J = q/r = N\phi/L$ – Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust – Design of shafts according to theories of failure.

Springs: Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel.

UNIT – III
Columns and Struts: Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – 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.

UNIT – IV

Direct and Bending Stresses: Stresses under the combined action of direct loading and B.M. Core of a section – determination of stresses in the case of chimneys, retaining walls and dams – conditions for stability – stresses due to direct loading and B.M. about both axes.

UNIT – V

Unsymmetrical Bending and Shear Centre

Un-symmetrical Bending: Introduction – Centroidal principal axes of section – Graphical method for locating principal axes – 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 Deflection of beams under unsymmetrical bending.

Shear Centre: Introduction Shear center for symmetrical and unsymmetrical sections (channel, I, T and L sections).

Text books:
1. A Textbook of Strength of Materials, by R. K. Rajput, 7e (Mechanics of Solids) SI Units S. Chand & Co, New Delhi.
2. Strength of materials by R. K. Bansal, Lakshmi Publications.

References:
1. Mechanics of Materials- by R. C.Hibbler, Pearson publishers.
2. Mechanics of Solids – E P Popov, Prentice Hall.
3. Strength of Materials by B.S.Basavarajaiah and P. Mahadevappa, 3rd Edition, Universities Press.
4. Mechanics of Structures Vol – I by H.J.Shah and S.B.Junnarkar, Charotar Publishing House Pvt. Ltd.

Course Outcomes:

Upon successful completion of this course,
1. The student will be able to understand the basic concepts of Principal stresses developed in a member when it is subjected to stresses along different axes and design the sections.
2. The student can assess stresses in different engineering applications like shafts, springs, columns and struts subjected to different loading conditions

Subject	HYDRAULICS AND HYDRAULIC MACHINERY				
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	3	0	0	3

Course Objectives:
1. To study about uniform and non-uniform flows in open channel and also to learn about the characteristics of hydraulic jump
2. To introduce dimensional analysis for fluid flow problems
3. To understand the working principles of various types of hydraulic machines and Pumps.

SYLLABUS
UNIT – I

Uniform Flow in Open Channel: Types of channels –Types of flows - Velocity distribution – Energy and momentum correction factors – Chezy"s, and Manning"s formulae for uniform flow – Most Economical sections, Critical flow: Specific energy-critical depth – computation of critical depth.

UNIT - II

Non-Uniform Flow in Open Channels: Steady Gradually Varied flow- Dynamic equation, Mild, Critical, Steep, horizontal and adverse slopes-surface profiles-direct step method- Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT – III

Hydraulic Similitude: Dimensional analysis-Rayleigh"s method and Buckingham"s pi theorem-study of Hydraulic models – Geometric, kinematic and dynamic similarities-dimensionless numbers – model and prototype relations.

UNIT – IV

Basics of Turbo Machinery: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency-Angular momentum principle.

UNIT – V

Hydraulic Turbines: Layout of a typical Hydropower installation – Heads and efficiencies - classification of turbines. Pelton wheel - Francis turbine - Kaplan turbine - working, working proportions, velocity diagram, work done and efficiency, hydraulic design, draft tube – theory and efficiency. Governing of turbines-surge tanks-unit and specific quantities, selection of turbines, performance characteristics-geometric similarity-cavitation.

Pumps:

Centrifugal-Pumps: Pump installation details-classification-work done- Manometric head-minimum starting speed-losses and efficiencies-specific speed, multistage pumps-pumps in parallel and series - performance of pumps-characteristic curves- NPSH- Cavitation.

Reciprocating Pumps: Introduction, classification, components, working, discharge, indicator diagram, work done and slip.

Text Books:
1. Open Channel flow, K. Subramanya, Tata McGraw Hill Publishers
2. Fluid mechanics and hydraulic machines, Rajput, A.K(2018) , S chand ,New Delhi
3. Fluid Mechanics, Modi and Seth, Standard book house.

References:
1. Fluid Flow in Pipes and Channels, G.L. Asawa, CBS
2. Fluid Mechanics and Machinery, C.S.P. OJHA, R. BERNDTSSON and P.N.Chandramouli, Oxford Higher Education.
3. Fluid Mechanics and Machinery, Md. Kaleem Khan, Oxford Higher education.
4. Fluid mechanics and Hydraulic machines, R.K. Bansal, Laxmi publications, New Delhi.

Course Outcomes:

Upon successful completion of this course the students will be able to:
1. Solve uniform and non-uniform open channel flow problems.
2. Apply the principals of dimensional analysis and similitude in hydraulic model testing.
3. Understand the working principles of various hydraulic machineries and pumps.

Subject	ENVIRONMENTAL ENGINEERING				
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	3	0	0	3

Course Objectives:

The object of the course student should have the capability to:

1. Outline planning and the design of water supply systems for a community/town/city and selection of source based on quality and quantity
2. Design of water treatment plant for a village/city
3. Impart knowledge on design of water distribution network
4. Design of sewers and plumbing system for buildings
5. Design of Sewage Treatment Plant

SYLLABUS

UNIT – I

Introduction: Importance and Necessity of Protected Water Supply systems, Water borne diseases, Flow chart of public water supply system, Role of Environmental Engineer.

Water Demand and Quantity Estimation: Estimation of water demand for a town or city, Per capita Demand and factors influencing it - factors affecting water demand, Design Period, Population forecasting.

Sources of Water: Lakes, Rivers, Comparison of sources with reference to quality, quantity and other considerations- Ground water sources: springs, Wells and Infiltration galleries,

Characteristics of water– Physical, Chemical and Biological characteristics and WHO guidelines for drinking water - IS 10500 2012 - Water quality standards for Agriculture, Industries and Construction.

UNIT – II

Treatment of Water: Treatment methods: Theory and Design of Sedimentation, Coagulation, Filtration. **Disinfection**: Theory of disinfection-Chlorination and other Disinfection methods.

Removal of colour and odours- Removal of Iron and Manganese - Adsorption- Fluoridation and deflouridation–Reverse Osmosis- Freezing.

UNIT – III

Collection and Conveyance of Water: Factors governing the selection of the intake structure, Conveyance of Water: Gravity and Pressure conduits, Types of Pipes, Pipe Materials, Pipe joints, Design aspects of pipe lines. Laying and testing of pipe lines- Capacity of storage reservoirs, Mass curve analysis.

Distribution of Water: Methods of Distribution system, Layouts of Distribution networks, Water main appurtenances - Sluice valves, Pressure relief valves, air valves, check valves, hydrants, and water meters–Ideal water supply system. Case studies.

UNIT – IV

Sewerage: Estimation of sewage flow and storm water drainage – fluctuations – types of sewers - design of sewers.

Sewer appurtenances – cleaning and ventilation of sewers.

House Plumbing: Systems of plumbing-sanitary fittings and other accessories– one pipe and two pipe systems – Design of drainage in Gated communities, Apartments and Hotels.

Septic Tank - working Principles and Design.

UNIT – V

Sewage characteristics –Characteristics of sewage - BOD equations. ThOD, COD and BOD.

Treatment of Sewage: Primary treatment. **Secondary treatment**: Activated Sludge Process, principles, designs, and operational problems. Oxidation ponds, Trickling Filters – classification – design, operation and maintenance problems. RBCs. Fluidized bed reactors –Anaerobic digestion of sludge, Sludge Drying Beds.

Ultimate Disposal of sewage: Methods of disposal – disposal into water bodies-Oxygen Sag Curve- Disposal into sea, disposal on land, Sewage sickness. Effluent standards.

Text Books:
1. Environmental Engineering – Howard S. Peavy, Donald R. Rowe, Teorge George Tchobanoglus – Mc-Graw-Hill Book Company, New Delhi, 1985.
2. Rural Municipal and Industrial water management, KVSG Murali Karishna, Environmental Protection Society, Kakinada, 2021.
3. Industrial Water and Wastewater Management, K.V.S.G. Murali Krishna, Paramount Publications, Visakhapatnam, 2018.
4. Elements of Environmental Engineering – K. N. Duggal, S. Chand & Company Ltd., New Delhi, 2012.

References:

1. Water Supply Engineering – P. N. Modi.
2. Water Supply Engineering – B. C. Punmia
3. Water Supply and Sanitary Engineering – G. S. Birdie and J. S. Birdie
4. Environmental Engineering (Vol.1) Water Supply Engineering - Santosh Kumar Garg, Khanna Publishers.
5. Sewage Disposal and Air Pollution Engineering by S.K. Garg, Khanna Publishers.
6. Waste Water Engineering by BC Punmia, Lakshmi publications Pvt lmtd.

Course Outcomes:

Course will enable the student to:

1. Select a source based on quality and quantity and Estimate design population and water demand
2. Design a water treatment plant for a village/city
3. Design a sewer by estimating DWF and Strom water flow and plumbing system for buildings
4. Design a Sewage Treatment Plant for a town/city.

Subject	**UNDERSTANDING HARMONY**				
Year/semester	**II B.Tech/II Sem**	**L**	**T**	**P**	**C**
Regulation year	**R - 20**	**2**	**1**	**0**	**3**

Course Objectives:

The objective of the course is:

1. Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

Course Topics:

Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; „Natural Acceptance‟ and Experiential Validation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

Module 2: Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient „I‟ and the material „Body‟
8. Understanding the needs of Self („I‟) and „Body‟ - happiness and physical facility
9. Understanding the Body as an instrument of „I‟ (I being the doer, seer and enjoyer)
10. Understanding the characteristics and activities of „I‟ and harmony in „I‟
11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
12. Programs to ensure Sanyam and Health.
    Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one‟s own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Module 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
14. Understanding the meaning of Trust; Difference between intention and competence
15. Understanding the meaning of Respect, Difference between respect and differentiation the other salient values in relationship
16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students" lives.

Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

Module 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
25. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems
26. Case studies of typical holistic technologies, management models and production systems
27. Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
28. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.

Module 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

29. Natural acceptance of human values
30. Definitiveness of Ethical Human Conduct
31. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
32. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems
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34. Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
35. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.

Text Book:
1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

Reference Books:
1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj – PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

Course Outcomes:
By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

Subject	ENVIRONMENTAL ENGINEERING LABORATORY				
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	0	0	3	1.5

Course Objectives:

The course will address the following:

1. Estimation of important characteristics of water and wastewater in the laboratory
2. Inference with reference to the significance of the characteristics of the water and wastewater.

List of Experiments:

1. Determination of pH and Electrical Conductivity (Salinity) of Water and Soil.
2. Determination and estimation of Total Hardness–Calcium &Magnesium in water.
3. Determination of P&M Alkalinity/Acidity
4. Determination of Chloride in water and soil
5. Determination and Estimation of total solids, organic solids and inorganic solids and Settleable Solids by Imhoff Cone.
6. Determination of Dissolved Oxygen with D.O. Meter &Wrinklers Method and BOD.
7. Physical parameters – Temperature, Colour, Odour, Turbidity and Taste.
8. Determination of C.O.D.
9. Determination of Optimum coagulant dose- with and without coagulant aids
10. Determination of Chlorine residue and demand
11. Presumptive Coliform test.

12. Desalination by Freezing and Boiling.
13. EC, TDs and Chloride in RO System- Raw water, Product water and Reject.
14. Suitability of water for construction
15. Evaporation, Rainfall, Humidity, Wind speed, Wind Direction

NOTE: At-least 10 of the experiments enlisted are to be conducted. Values for different water and wastewater samples like Surface water, Ground water, Sea water, Municipal water, Bottled water, RO- Raw water, Product and Reject samples, Municipal sewage, Industrial waters etc.

List of Equipment's:
1. pH meter
2. Turbidity meter
3. Conductivity meter
4. Hot air oven
5. Muffle furnace
6. Dissolved Oxygen meter
7. U–V visible spectrophotometer
8. COD Reflux Apparatus
9. Jar Test Apparatus
10. BOD Incubator
11. Autoclave
12. Laminar flow chamber
13. Hazen"s Apparatus
14. Chloroscope
15. Weather Station

Text Books:
1. Standard Methods for Analysis of Water and Waste Water –APHA
2. Chemical Analysis of Water and Soil by KVSG Murali Krishna, Environmental Protection Society, 4th Edition, 2021.

Reference:
1. Relevant IS Codes.
2. Chemistry for Environmental Engineering by Sawyer and Mc.Carty

Course Outcomes:
Upon the successful completion of this course, the students will be able to:
1. Estimate some important characteristics of water, wastewater and soil in the laboratory
2. Draw some conclusion and decide whether the water is suitable for Drinking / Construction /Agriculture/ Industry.
3. Estimate Chloride, EC and Salinity of Soil and suggest their suitability for Construction /Agriculture
4. Estimation of the strength of the sewage in terms of BOD and COD and Decide whether the water body is polluted or not with reference to the stated parameters in the list of experiments
5. Demonstration of various instruments used in testing of water and soil and study of Drinking water standards, WHO guidelines, Effluent standards and standards for Construction / Agriculture/Industry.

Subject	STRENGTH OF MATERIALS LABORATORY				
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	0	0	3	1.5

Course Objectives:

The course will address the following:

1. To determine experimental data for spring testing machine, compression testing machine, impact tester, hardness tester.
2. To determine stress analysis and design of beams subjected to bending.

Experiments:

1. Tension test on Mild steel bar
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simply supported beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test (Charpy and Izod impact test)
9. Shear test (on UTM)
10. Continuous beam – deflection test.
11. Use of Electrical resistance strain gauges
12. Verification of Maxwell's Reciprocal theorem on beams.

List of Major Equipment:

1. Universal Testing Machine
2. Torsion testing machine
3. Brinnell's / Rock well's hardness testing machine
4. Setup for spring tests

5. Compression testing machine
6. Izod Impact machine
7. Shear testing machine
8. Beam setup for Maxwell's theorem verification.
9. Electrical Resistance gauges

10. Compression testing machine
11. Izod Impact machine
12. Shear testing machine
13. Beam setup for Maxwell''s theorem verification.
14. Electrical Resistance gauges

Course Outcomes:

Upon the successful completion of this course, the students will be able to:

1. Analyze and design structural members subjected to tension& compression
2. Understand the basic concepts of stress, strain, deformation, and material behaviour under different types of loading
3. Calculate the stresses and strains in axially-loaded members
4. Ability to conduct tension tests.

Subject	FLUID MECHANICS AND HYDRAULIC MACHINERY LABORATORY				
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	0	0	3	1.5

Course Objectives:
1. To calibrate the various discharge measuring instruments for flow through pipes.
2. To determine the coefficient of discharge through small orifice and mouth piece
3. To calibrate the notches for discharge measurement for flow through open channels.
4. To determine the friction factor and losses for flow through pipes
5. To verify the Bernoulli"s theorem.

List of Experiments:
1. Calibration of Venturi meter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice and mouth piece by a constant head and variable head method.
3. Calibration of contracted Rectangular Notch and /or Triangular Notch
4. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
5. Verification of Bernoulli"s equation.
6. Impact of jet on vanes
7. Study of Hydraulic jump.
8. Performance test on Pelton wheel turbine
9. Performance test on Francis turbine.
10. Efficiency test on centrifugal pump.
11. Efficiency test on reciprocating pump.

List of Equipment:
1. Venturi meter setup.
2. Orifice meter setup.
3. Small orifice setup.
4. External mouth piece setup.
5. Rectangular and Triangular notch setups.
6. Friction factor test setup.

7. Bernoulli's theorem setup.
8. Impact of jets.
9. Hydraulic jump test setup.
10. Pelton wheel, Francis turbine and Kaplan turbines
11. Centrifugal and Reciprocating pumps.

Course Outcomes:
1. Apply the theoretical principles in calibrating the flow measuring devices used in pipes, channels and tanks.
2. Understand the concept of friction factor and losses through pipes.

Subject	ADVANCED CONSTRUCTION PLANNING LABORATORY				
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	1	0	2	2

Course Objectives:

By the end of this course the students are expected

1. To understand the fundamental principles and concepts of building by-laws planning and architecture for buildings.
2. To study about different views of layout plans within the field.
3. To gain knowledge on concepts of Vastu.

List of experiments:

1. Introduction to building by-laws as per latest G.O.
2. Concepts of Vastu landscape and interior design practices.
3. Evaluation, measurement and drawing of Commercial buildings.
4. Evaluation, measurement and drawing of Plots and layouts with in the given field.
5. Preparation of a blueprint model of G+1 storey residential building plan as per by-laws.

Course outcomes:

By the end of this course students will be able to

1. Understand the fundamentals of latest building by-laws.
2. Understand various Vastu concepts in construction practices.
3. Prepare working drawings and other executable drawings with proper details for Commercial buildings and execute drawings for Plots.
4. Prepare the blueprint models ofresidential building plans.

Subject	CRITICAL READING AND CREATIVE WRITING			
Year/semester	II B.Tech/II Sem	L	T	P	C
Regulation year	R - 20	3	0	0	0

Course objectives:

The students will have the ability to

1. Understand how to identify, analyze, interpret and describe critical ideas, themes, and values in literary texts
2. List the elements of a Short Story
3. Apply critical and theoretical approaches to the reading and analysis of literary texts in multiple genres

SYLLABUS

UNIT – I

Essentials of Good Writing

1. Focus, Development, Unity, Coherence and Correctness
2. Imagery
   A. Figurative Language- Simile, Metaphor, Personification, Hyperbole, Oxymoron, Paradox, Alliteration, Assonance
   B. Sensory details
3. Point of View

UNIT – II

Elements of a Short story

1. Plot, Setting, Character, Theme
2. Analysis of given short stories: 2 stories

   A. Good Sees the Truth but Waits by Leo Tolstoy
   B. The Cop and the Anthem by O. Henry

UNIT – III

Prose Writing:

   Reflective Writing – Personal Essay
   Descriptive Writing: Person/Place/Thing

UNIT – IV

Reading Comprehension

   Reading for facts, contextual vocabulary, tone and inference

UNIT – V

Speech Analysis
   A. Tryst with Destiny-
      https://www.youtube.com/watch?v=lrEkYscgbqE
   B. Stay Hungry, Stay Foolish –
      https://www.youtube.com/watch?v=UF8uR6Z6KLc

References:

The Cambridge Companion to Creative Writing (South Asian Edition)

Creative Writing: A Beginner''s Manual (Paper Back Edition)

Teaching and Developing Reading Skills: Cambridge Handbooks for Language Teachers

Web References:

https://www.skillsyouneed.com/learn/critical-reading.html

https://englishforeveryone.org

http://sixminutes.dlugan.com/speech-evaluation-1-how-to-study-critique-speech/

http://www.homeofbob.com/literature/genre/fiction/ficElmnts.html

Course Outcomes:
Upon the completion of the course, the student will be able to:
   1. Understand and explain the characteristics of a literary text
   2. Critically analyze the quality of a Shorty Story
   3. Produce essays like personal essay or descriptive essay applying the principles of good writing
   4. Identify facts, themes and critical ideas in a passage
   5. Articulate an awareness of the basic elements of a speech