VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

Affiliated to JNTUH, Approved by AICTE, Accredited by NAAC and ISO 9001:2015 Certified

Shamshabad - 501 218, Hyderabad, Telangana State, India.

www.vardhaman.org

BACHELOR OF TECHNOLOGY

CIVIL ENGINEERING

COURSE STRUCTURE & SYLLABUS (VCE-R18)

CHOICE BASED CREDIT SYSTEM

B. Tech. - Regular Four Year Degree Program

(For batches admitted from the Academic Year 2018 - 2019)

&

B. Tech. - Lateral Entry Scheme

(For batches admitted from the Academic Year 2019 - 2020)

COURSE STRUCTURE (VCE-R18)

B. TECH - CIVIL ENGINEERING

REGULATIONS: VCE-R18

II YEAR I SEMESTER

Code	Course	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A4101	Building Planning and Drawing	PC	3	0	2	4	30	70	100
A4102	Fluid Mechanics	PC	3	1	0	4	30	70	100
A4103	Strength of Materials - I	PC	3	1	2	5	30	70	100
A4104	Surveying	PC	3	0	2	4	30	70	100
A4017	Quantitative Aptitude - I	BS	1	0	0	1	30	70	100
A4025	Managerial Economics and Financial Analysis	HS	3	0	0	3	30	70	100
A4014	Environmental Science*	MC	2*	0	0	0	30*	70*	100*
	TOTAL		**18**	**02**	**06**	**21**	**180**	**420**	**600**

II YEAR II SEMESTER

Code	Course	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A4019	Verbal Ability and Logical Reasoning	HS	1	0	0	1	30	70	100
A4012	Probability and Statistics	BS	2	1	0	3	30	70	100
A4105	Strength of Material-II	ES	3	1	0	4	30	70	100
A4106	Concrete Technology	PC	3	0	2	4	30	70	100
A4107	Structural Analysis	PC	3	0	0	3	30	70	100
A4108	Hydraulics and Hydraulic Machines	PC	3	0	2	4	30	70	100
A4109	Advanced Surveying	PC	1	0	2	2	30	70	100
A4013	Gender sensitization*	MC	2*	0	0	0	30*	70*	100*
	TOTAL		**18**	**02**	**06**	**21**	**210**	**490**	**700**

SYLLABUS

II Year I Semester & II Year II Semester

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year I Sem

BUILDING PLANNING AND DRAWING

Course Code: **A4101**

L	T	P	C
3	0	2	4

SYLLABUS

UNIT – I **(9 LECTURES)**

BUILDING BYELAWS AND REGULATIONS: Introduction, Terminology, Objectives of building byelaws,Floor area ratio (FAR) and Floor space Index (FSI), Principles underlying building byelaws, classification of bye buildings.

UNIT – II **(9 LECTURES)**

Open space requirements, built up area limitations, Height of Buildings, Wall thickness, lighting and ventilation requirement.

UNIT – III **(9 LECTURES)**

RESIDENTIAL BUILDINGS: Minimum standards for various parts of buildings, requirements of different rooms and their grouping, characteristics of various types of residential buildings.

UNIT – IV **(9 LECTURES)**

PUBLIC BUILDINGS: Planning of Educational institutions, hospitals, dispensaries, Office buildings, banks, industrial buildings, hotels and motels, buildings for recreation.

UNIT – V **(9 LECTURES)**

PLANNING OF CONSTRUCTION PROJECTS: scheduling and monitoring Bar chart, CPM and PERT Network planning, Computation of times and floats their significance.

Part-B

1. **SITE LAYOUT:** marking of frontage and open spaces around building, minimum plinth height and height of building.
2. **SIGN CONVENTIONS & SYMBOLS:** Brick, Stone, Plaster, Sand filling, Concrete, Glass, Steel, Cast iron, Copper alloys, Aluminum alloys etc., Lead, Zinc, tin, and white lead etc., Earth, Rock, Timber and Marble.
3. English bond odd & even courses for one, one and half and two brick walls in thickness at the junction of a corner.
4. Flemish bond odd & even courses for one, one and half and two brick walls in thickness at the junction of a corner.
5. **DOORS & WINDOWS:**Paneled and glazed door, glazed windows – paneled Windows.
6. **VENTILATORS AND ROOFS:** fixed ventilator, Couple roof and Collar roof, King Post truss and Queen post truss.
7. **STAIR CASE:**Straight stair case with two flights
8. **ROOM LAYOUTS:** living , dining , kitchen, bed room, bath and water closet layouts
9. **BUILDINGS:** Given line diagram with specification to draw plan, section and elevation of a building
10. **OFFICE BUILDING:** Given line diagram with specification to draw plan, section and elevation of a office building
11. **TWO STOREY RESIDENTIAL BUILDING:** Given line diagram with specification to draw plan, section and elevation of a office building

TEXT BOOK:

1. Dr. N.Kumaraswamy, Building Planning and Drawing, Tata McGraw-Hill, New Delhi, India.

2. B.C.Punmia&Khandelwal, *PERT and CPM*, Project planning and control, Laxmi publications, New Delhi, India.

REFERENCE BOOKS:

1. R.L. Peurifoyetal, Construction Planning, Equipment and methods, Tata Mc. Graw Hill Publications, New Delhi, India.
2. Building by laws by state and Central Governments and Municipal corporations.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II year I Sem

FLUID MECHANICS

Course Code: **A4102**

L	T	P	C
3	1	0	4

SYLLABUS

UNIT – I **(9 LECTURES)**

PROPERTIES OF FLUIDS: Introduction of fluids, Physical properties of fluids-mass density, weight density, specific gravity, specific volume, viscosity, surface tension, vapour pressure, cavitation and their influences on fluid motion, Classification of fluids: Newtonian and Non-Newtonian fluids, Newton's law of Viscosity and applications.

HYDROSTATIC FORCES: Total pressure and centre of pressure, Hydrostatic forces on submerged planes-Horizontal, Vertical, inclined and curved surfaces, Principle of Buoyancy-metacentric height, conditions of Equilibrium.

PRESSURE MEASUREMENT: fluid pressure at a point, Pascal's law, Hydrostatic law, atmospheric, gauge and vacuum pressure. Measurement of Pressure- simple Manometers, differential Manometers.

UNIT – II **(9 LECTURES)**

FLUID KINEMATICS: Introduction, Methods of Describing fluid motion-Eulerian and Lagrangian Approach, Stream line, path line, streak lines and stream tube. Classification of flows: Steady-unsteady, uniform-non uniform, laminar-turbulent, rotational -Irrotational flows. Equation of continuity for one, two, three dimensional flows, velocity and acceleration functions, Stream Function and Velocity Potential Functions, Flow Net Analysis.

UNIT – III **(9 LECTURES)**

FLUID DYNAMICS: Surface and body forces - Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, applications of Bernoulli's equation-Pitot tube, Venturi-meter and orifice meter, Momentum equation and its application - forces on pipe bend.

Notches and Weirs: Classification of Notches and Weirs, Discharge over rectangular, triangular and trapezoidal and Stepped notches, Velocity of Approach concept, Discharge over a Broad crested, Cipolletti, Narrow crested, Ogee weirs.

UNIT – IV **(9 LECTURES)**

BOUNDARY LAYER THEORY: - Introduction, Definitions, Characteristics of boundary layer along a thin flat plate, Vonkarmen momentum integral equation, drag force on a Flat Plate due to Boundary Layer-laminar and turbulent Boundary layers, separation of Boundary Layer, Methods of preventing the separation of Boundary Layer, flow around submerged objects-Drag and Lift- Magnus effect.

UNIT – V **(9 LECTURES)**

FLOW THROUGH PIPES: Introduction, Reynolds's experiment - Characteristics of Laminar & Turbulent flows. Loss of Energy in Pipes-Major, Minor losses, losses - pipes in series- pipes in parallel -Total energy line and hydraulic gradient line. Equivalent pipe concept, flow through branched pipes, water hammer in pipes.

TEXT BOOKS:

1. Dr.R.K Bansal (Revised Edition),FLUID MECHANICS AND HYDRAULIC MACHINES, Laxmi Publications (p).Ltd,New Delhi.

REFERENCE BOOKS:

1. J.F.Douglas, J.M. Gaserek and J.A.Swaffirld , Fluid Mechanics, Longman.

2. Frank.M. White, Fluid Mechanics, Tata Mc.Grawhill Pvt. Ltd.
3. A.K. Mohanty, Fluid Mehanics, Prentice Hall of India Pvt. Ltd., New Delhi.
4. Modi and Seth (2012), Fluid Mechanics, Standard book house.
5. S.K.Som&G.Biswas (2013), Introduction to Fluid Machines, Tata McGraw-Hill publishers Pvt. Ltd.
6. Edward J. Shaughnessy, Jr, Ira M. Katz and James P. Schaffer, Introduction to Fluid Machines, Oxford University Press, New Delhi.

VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year I Sem

STRENGTH OF MATERIALS -I

Course Code: **A4103**

L	T	P	C
3	1	2	5

SYLLABUS

UNIT – I **(9 LECTURES)**

SIMPLE STRESSES AND STRAINS: Elasticity and plasticity Types of stresses and strains Hooke's law stress -strain diagram for mild steel, Working stress, Factor of safety Lateral strain, Poisson's ratio and volumetric strain Elastic moduli and the relationship between them Bars of varying section composite bars Temperature stresses.

STRAIN ENERGY: Resilience Gradual, sudden, impact and shock loadings simple applications.

UNIT – II **(9 LECTURES)**

SHEAR FORCE AND BENDING MOMENT: Definition of beam Types of beams Concept of shear force and bending moment S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, U.D.L, uniformly varying loads and combination of these loads Point of contra flexure Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT – III **(9 LECTURES)**

FLEXURAL STRESSES & SHEAR STRESSES FLEXURAL STRESSES: Theory of simple bending Assumptions Derivation of bending equation, Neutral axis Determination of bending stresses section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections Design of simple beam sections.

SHEAR STRESSES: Derivation of formula Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T, angle sections**.**

UNIT – IV **(9 LECTURES)**

DEFLECTION OF BEAMS: Bending into a circular arc slope, deflection and radius of curvature Differential equation for the elastic line of a beam Double integration and Macaulay's methods. Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L. uniformly varying load.-Mohr's theorems Moment area method application to simple cases including overhanging beams.

CONJUGATE BEAM METHOD:

INTRODUCTION: Concept of conjugate beam method.

UNIT – V **(9 LECTURES)**

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- analytical and graphical solutions.

LIST OF EXPERIMENTS

1. Tension test (Stress-strain curve for mild steel)
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. 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.

TEXT BOOK:

1. Introduction to text book of Strength of materials by R.K.Bansal Laxmi publications Pvt. Ltd., NewDelhi.
2. Introduction to text book of Strength of Material by U.C. Jindal, Galgotia publications.

REFERENCE BOOKS:

1. Mechanics of Solid, by Ferdinand P Beer and others Tata MCGrawhill Publications 2000.
2. Strength of Materials by Schaum'soutline series Mc. Grawhill International Editions.
3. Strength of Materials by S. Ramakrishna and R.Narayan _ Dhanpat Rai publications.
4. Strength of materials by R.K.Rajput, S.Chand& Co, New Delhi.
5. Strength of Materials by A.R.Basu, Dhanpat Rai & Co, Nai Sarah, New Delhi.
6. Strength of Materials by L.S.Srinath et al., Macmillan India Ltd., Delhi.
7. Strength of materials by R. Subramanian, Oxford university press, New Delhi.

VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year I Sem

STRENGTH OF MATERIALS -I

Course Code: **A4103**

L	T	P	C
3	1	2	5

LIST OF EXPERIMENTS

1. Tension test (Stress-strain curve for mild steel)
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. 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.

VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year I Sem

SURVEYING

Course Code: **A4104**

L	T	P	C
3	0	2	4

SYLLABUS

UNIT – I **(9 LECTURES)**

INTRODUCTION: Surveying-objectives of surveying-Classification of surveys-Principles of Surveying**.**
CHAIN SURVEYING: Instruments for chaining – obstacles in chaining –Problems – Traversing – plotting.

UNIT – II **(9 LECTURES)**

COMPASS SURVEYING: Introduction to compass survey -Types of compasses–Designation of Bearings – Calculation of included angles from bearings -Traversing -Local attraction- Problems- Errors in compass survey.

UNIT – III **(9 LECTURES)**

PLANE TABLE SURVEYING: Introduction- accessories- Methods of plane tabling- Errors in plane tabling.

UNIT – IV **(9 LECTURES)**

LEVELLING: Levels and Staves –Types of levelling - Bench Marks - Temporary and permanent adjustments – Booking – Reduction and Arithmetic checks - Fly levelling - longitudinal and cross sectioning – Plotting - Errors in levelling.

UNIT – V **(9 LECTURES)**

CONTOURING: Contours and contouring - Characteristics and uses – methods - Interpolation of contours.

LIST OF EXPERIMENTS

1. Survey of an area by chain survey (closed traverse) & Plotting
2. Chaining across obstacles
3. Determination of distance between two inaccessible points with compass.
4. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.
5. Radiation method by plane Table survey
6. Intersection methods by plane Table survey
7. Fly leveling (differential leveling).
8. An exercise of longitudinal profile.
9. An exercise of cross sectional profile.
10. Two exercises on contouring.

TEXT BOOK:

1. Dr. K.R. Arora, Surveying Vo.I, Standard Book House, 6th edition, 2000.
2. Punmia, Surveying Vol.I, Standard Book House, 9th edition, 1985.

REFERENCE BOOKS:

1. S.K.Duggal, Surveying Vol.I, Tata Mcgraw Hill, 2nd edition.
2. R.subramanian,Surveying and levelling, second Edition,Oxford University press-2012.

3. R. Agor,Surveying and levelling Khanna Publishers.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year I Sem

SURVEYING

Course Code: **A4104** | **L T P C**

LIST OF EXPERIMENTS | **3 0 2 4**

1. Survey of an area by chain survey (closed traverse) & Plotting.
2. Chaining across obstacles.
3. Determination of distance between two inaccessible points with compass.
4. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.
5. Radiation method by plane Table survey.
6. Intersection methods by plane Table survey.
7. Fly leveling (differential leveling).
8. An exercise of longitudinal profile.
9. An exercise of cross sectional profile.
10. Two exercises on contouring.

11.

VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year I Sem

QUANTITATIVE APTITUDE -1

Course Code: **A4017**

L	T	P	C
1	0	0	1

SYLLABUS

UNIT – I **(9 LECTURES)**

Ratio and Proportion: Ratio,Proportion,Variations,Problems on Ages.

Average, Mixtures and Alligation:Averages,Weighted average, Difference between mixture and alligation, Problems on Mixtures and allegation.

UNIT – II **(9 LECTURES)**

Percentages,SI & CI: Fundamentals of Percentage,Percentage change, SI and CI,Relation between SI, CI

Data Interpretation: Introduction,Tabulation,Bar Graph,Pie Charts,Line Graphs,Combined Graphs.

UNIT – III **(9 LECTURES)**

Profit and loss, Partnerships: Basic terminology in profit and loss,Types of partnership,Problems related to partnership.

Logarithms: Fundamental formulae of logarithms and problems,finding no of terms on expanding a given number.

UNIT – IV **(9 LECTURES)**

Permutation and combination: Fundamentals counting principle,Definition of Permutation,Seating arrangement,Problems related to alphabets,Rank of the word,Problems related to numbers,Circular permutation,Combination.

UNIT – V **(9 LECTURES)**

Clocks: Introduction, Finding angle between hands of clock, Gain/Loss of Time, Finding time, Gain or loss of time.

Calendar: Calendars method- 1,Calendars method -2.

TEXT BOOK:

1. Quantitative Aptitude for competitive examinations by R.S Aggarwal
2. Quantitative Aptitude for competitive examinations by Abhijit Guha
3. The Pearson guide to Quantitative Aptitude by Dinesh Khattar.

12.

VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year I Sem

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: **A4023**

L	T	P	C
2	1	0	3

SYLLABUS

UNIT – I **(9 LECTURES)**

INTRODUCTION TO MANAGERIAL ECONOMICS & DEMAND: Managerial Economics - Meaning, Definition, Nature and Scope of Managerial Economics – Demand Analysis: Demand- Meaning, Types, Demand Determinants, Law of Demand and its assumptions & exceptions**.**

ELASTICITY OF DEMAND: Meaning, Types, Measurement and Significance - Demand Forecasting: Meaning, Need, Methods of demand forecasting.

UNIT – II **(9 LECTURES)**

PRODUCTION ANALYSIS: Production – Meaning, Production function, Production function with one variable input, Iso-quants and Iso-costs, MRTS, Least Cost Combination of Inputs, Law of returns to scale - Internal and External Economies of Scale.

COST & BREAK EVEN ANALYSIS: Cost- Meaning, Concepts: Opportunity cost, Fixed vs. Variable costs, Explicit costs Vs. Implicit costs, Average cost, Marginak cost, and Sunk costs. Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems) - Significance and limitations of BEA.

UNIT – III **(9 LECTURES)**

INTRODUCTION TO MARKETS: Market – Meaning, structures-Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, Oligopoly - Price-Output Determination in case of Perfect Competition, Monopoly.

PRICING: Objectives and Pricing policies - Methods of Pricing: Cost Plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two-Part Pricing, Block Pricing, Bundling Pricing, Peak Load Pricing, Cross Subsidization.

UNIT – IV **(9 LECTURES)**

CAPITAL: Capital and its significance, Types of Capital, Components of working capital & factors determining the need of working capital - Methods and sources of raising finance.

CAPITAL BUDGETING: Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), Net Present Value Method, Profitability Index, Internal rate of return (simple problems).

UNIT – V **(9 LECTURES)**

INTRODUCTION TO FINANCIAL ACCOUNTING: Accounting Principles - Concepts, Conventions - Double-Entry Book Keeping - Journal, Ledger, Trial Balance- Final Accounts with simple adjustments.

FINANCIAL ANALYSIS THROUGH RATIOS: Ratio – Meaning, importance - Types: Liquidity Ratios, Solvency Ratios, Turnover Ratios and Profitability ratios. (Simple problems).

TEXT BOOK:

1. A.R. Aryasri (2011), *Managerial Economics and Financial Analysis*, TMH, India.

REFERENCE BOOKS:

1. Varshney &Maheswari(2003), *Managerial Economics*, Sultan Chand.
2. Ambrish Gupta (2011), *Financial Accounting for Management: An Analytical Perspective*, 4th Edition, Pearson Education, New Delhi.
3. Richard Lipsey and Alec Chrystal (2012), *Economics*, Oxford University Press.
4. Domnick Salvatore: *Managerial Economics in a Global Economy*, 4th Edition,Thomson.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year I Sem

ENVIRONMENTAL SCIENCE

Course Code: **A4014**

L	T	P	C
2	0	0	0

SYLLABUS

UNIT – I **(3 LECTURES)**

ECOSYSTEMS

INTRODUCTION: Environment Definition, The multidisciplinary nature of environmental studies, importance of environmental education.

ECOSYSTEMS: Ecosystem Definition. Classification of ecosystems. Structure of an ecosystem: Producers, Consumers and Decomposers. Function of ecosystems: Food chains, food webs and energy flow in an ecosystem. Ecological pyramids: Pyramid of number, Pyramid of biomass and Pyramid of energy.

UNIT – II **(3 LECTURES)**

NATURAL RESOURCES

Classification of resources: Renewable and Non-renewable resources.

Forest resources: Uses and over exploitation of forests. Dams and their effects on forest and tribal people.

Water resources: Use and over utilization of surface and ground water, conflicts over water.

Food resources: Effects of modern agriculture practices on environment. Problems with Chemical fertilizers and pesticides. Bio fertilizers (organic farming) and their importance.

Energy resources: Renewable energy resources: solar energy, wind energy, geothermal energy.

Biofuels: Definition, Gobar gas production and Biodiesel production by trans esterification.

UNIT – III **(3 LECTURES)**

BIODIVERSITY AND ITS CONSERVATION:

Introduction and definition. Genetic diversity, species diversity and ecosystem diversity.

Values of biodiversity: Consumptive use, Productive use, Social,Ethical, Aesthetic and Option values. Threats to biodiversity: Habitat loss, poaching of wildlife,Man-wildlife conflicts. In-situ conservation of biodiversity. Ex-situ conservation of biodiversity.

UNIT – IV **(3 LECTURES)**

ENVIRONMENTAL POLLUTION: Definition, causes, effects and control measures of Air Pollution, Water pollution, Marine pollution, Soil pollution, Noise pollution, Thermal pollution, Global warming, Acid rains and Ozone layer depletion.

Solid waste management: Causes, effects and methods of solid waste disposal. E-waste management. Role of an individual in prevention of pollution.

UNIT – V **(3 LECTURES)**

SOCIAL ISSUES AND THE ENVIRONMENT: Concept of sustainable development:Sustainable development goals. Threats to sustainability: Population explosion, crazy consumerism. Green building concept. Water conservation, Rainwater harvesting, watershed management.

A brief study about: Mission Kakatiya, water man of India Dr. Rajendra Singh, Anna hazare watershed management development programme, Bishnoi tribe environmental conservation and environmental ethics.

Environmental Policies and Legislations: Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act.

TEXT BOOKS:

1. ErachBharucha. Textbook of Environmental Studies for Undergraduate Courses. 1st edition, Universities press, 2005.
2. S.Deswal and A.Deswal. A basic course in environmental studies. 2nd edition, Dhanapathi rai & Co.2004.
3. Anubha Kaushik, C.P. Kaushik. Perspectives in Environmental Studies. 4th edition, New age international publishers, 2014.
4. Benny joseph. Environmental studies. 3rd edition, McGraw Hill Education (India) Private Limited, 2018.

REFERENCE BOOKS:

1. Daniel B.Botkin and Edwards A.Keller. Environmental science. 8th edition, Wiley India (P) Ltd, 2014.
2. Richard T. Wright. Environmental Science: towards a sustainable future. 4th edition, PHL Learning Private Ltd, 2008.
3. P.D.Sharma. Ecology and Environment. 5th edition, Rastogi Publications, 2005.

II Year II Semester

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year II Sem

VERBAL ABILITY AND LOGICAL REASONING

Course Code: **A4019**

L	T	P	C
1	0	0	1

SYLLABUS

UNIT – I **(3 LECTURES)**

Coding and Decoding: Coding and Decoding, Arrow Method, Chinese coding, Series, Analogy, Odd man out.

UNIT – II **(3 LECTURES)**

a)Articles and Tenses: Introduction, usage of articles, Omission of Articles, Types of tenses, Forms and Usage of tenses.

b)Direction Sense: Introduction, Distance method, Facing Method and Shadow Method.

UNIT – III **(3 LECTURES)**

a) Blood Relations: Introduction, Direct, Puzzle and Coded models

b) Voices and Forms of Speech: Introduction, conversion of active and passive voice, conversions of direct and indirect speech.

UNIT – IV **(3 LECTURES)**

a) Data Arrangements: Linear Arrangement, Circular Arrangement, Multiple Arrangements.

b) Syllogisms: Introduction, Tick-Cross method, Inferential Technique, Venn-Diagram method.

UNIT – V **(3 LECTURES)**

a) Visual Reasoning: Patterns, Folded Images, Cubes and Analytical Reasoning.

b) Sentence Correction: Subject-Verb Agreement, Pronoun Antecedent, Parallelism, Verb-Time Sequence Error, Determiners and Modifiers.

TEXT BOOK:

1. A Modern Approach to Logical Reasoning Book by R.S. Aggarwal and Vikas Aggarwal.
2. Test of Reasoning Paperback by Edgar Thorpe and Logical Reasoning by Arun Sharma.

VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year II Sem

PROBABILITY AND STATISTICS

Course Code: **A4012**

L	T	P	C
3	1	0	4

SYLLABUS

UNIT – I **(9 LECTURES)**

Probability: Sample Space, Events, Counting Sample Points, Probability of an Event, Additive Rules, Conditional Probability, Independence, and the Product Rule, Bayes' Theorem.

UNIT – II **(9 LECTURES)**

Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions,Statistical Independence, Joint Probability Distributions. Mean of a Random Variable, Variance andCovariance of Random Variables, Means and Variances of Linear Combinations of Random Variables.

UNIT – III **(9 LECTURES)**

Discrete and Continuous Distributions: Discrete distributions: Binomial distribution, Poisson Distribution, Continuous Distribution: Uniform distribution, Normal distribution.

UNIT – IV **(9 LECTURES)**

Estimation and Testing of Hypothesis for Largesamples Point estimation, Maximum error estimate, Interval Estimation, Introduction to Hypothesis, Type I and Type II error, Level of significance, one tailed and two tailed test, Test concerning one mean and one proportion, Two means and two Proportions.

UNIT – V **(9 LECTURES)**

Testing of Hypothesis for Small samples Test for single mean, difference of means and paired t-test, Test for ratio of variances (F-test), Chi-square test for goodness of fit and independence of attributes.

TEXT BOOK:

1. Ronald E. Walpole,Raymond H. Myers,Sharon L. Myers,Keying Ye.,Probability & Statistics for Engineers & Scientists, 9 th Edition,Pearson Publication, 2012.
2. S.C. Gupta and V. K. Kapoor, Fundamentals of Mathematical statistics, Tenth Revised Edition,S Chand & Sons, New Delhi, 2000.

REFERENCE BOOKS:

1. T.T. Soong,Fundamentals of Probability and Statistics for Engineers,John Wiley & Sons, Ltd, 2004
2. Sheldon M Ross, Probability and Statistics for Engineers and Scientists, 4 th Edition, Academic Press, 2009.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9 th Edition, John Wiley & Sons, 2006.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year II Sem

STRENGTH OF MATERIALS-II

Course Code: **A4105**

L	T	P	C
2	1	0	3

SYLLABUS

UNIT – I **(9 LECTURES)**

Torsion of Circular Shafts: Theory of pure torsion – Derivation of Torsion equations : $T/J = q/r = N\theta/L$ – 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 – Carriage or leaf springs.

UNIT – II **(9 LECTURES)**

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.

Beam Columns: Laterally loaded struts – subjected to uniformly distributed and concentrated loads – Maximum B.M. and stress due to transverse and lateral loading.

UNIT – III **(9 LECTURES)**

Direct and Bending Stresses: Stresses under the combined action of direct loading and bending moment, 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 bending moment about both axis.

Beams Curved In Plan: Introduction – circular beams loaded uniformly and supported on symmetrically placed Columns – Semi-circular beam simply-supported on three equally spaced supports.

UNIT – IV **(9 LECTURES)**

Thin Cylinders: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Thin spherical shells.

Thick Cylinders: Introduction - Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

UNIT – V **(9 LECTURES)**

Unsymmetrical 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 centre for symmetrical and unsymmetrical (channel, I, T and L) sections

TEXT BOOK:

1. Strength of Materials R. Subramanian, Oxford University Press 2010

2. R.K.Bansal, A Text book of Strength of materials, Laxmi Publications (P) ltd., New Delhi
3. B.C. Punmia, Strength of Materials, Laxmi Publications (P) ltd., New Delhi

REFERENCE BOOKS:

1. Mechanics of Materials Ferdinand P. Beer et al., Tata McGraw Hill Education Pvt. Ltd 5th edition 2009
2. Fundamentals of Solid Mechanics by M. L. Gambhir, PHI Learning Pvt. Ltd
3. Introduction to Strength of Materials by U. C. Jindal, Galgotia Publications Pvt. Ltd.
4. Strength of Materials by S. S. Rattan, Tata McGraw Hill Education Pvt. Ltd.
5. Strength of Materials by R.K Rajput, S. Chand & Company Ltd.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year II Sem

CONCRETE TECHNOLOGY

Course Code: **A4106**

L	T	P	C
2	0	2	3

SYLLABUS

UNIT – I **(9 LECTURES)**

CEMENT: Portland cement- chemical composition- Hydration of cement-Structure of Hydrated cement-Test on physical properties- Different grades of cement**.**

AGGREGATES: Classification of aggregate- Physical and Mechanical Properties of Aggregates-Deleterious substance in aggregate- Soundness of aggregate- Alkali aggregate reaction- Thermal properties of Aggregates-Grading of Aggregates-Sieve Analysis—Standard Grading Curves-Manufactured Sand.

UNIT – II **(9 LECTURES)**

ADMIXTURES: Types of admixtures- mineral and chemical admixtures- properties-dosages- effects-usage.

FRESH CONCRETE: Workability- Factors affecting workability Measurement of workability by different tests- Setting times of concrete- Effect of time and temperature on workability- Segregation &bleeding-Mixing and vibration of concrete- steps in manufacture of concrete- Quality of mixing water.

UNIT – III **(9 LECTURES)**

HARDENED CONCRETE: Water/cement ratio- Gel space ration- Nature of strength of concrete- Maturity concept- Strength in tension & compression- Factors affecting strength- Relation between compression & tensile strength- Curing.

TESTING OF HARDENED CONCRETE: Compression tests- Tension tests- Factors affecting strength-flexure tests- Split tensile test- Pull-out test, Nondestructive testing methods-codal provisions for NDT. Elasticity, Creep& Shrinkage-Modulus of elasticity- Dynamic modulus of elasticity-Creep of concrete-Factors influencing creep- Relation between creep & time- Effects of creep- Shrinkage- types of shrinkage.

UNIT – IV **(9 LECTURES)**

MIXED DESIGN: Factors, the choice of mix proportions- Durability of concrete-Quality Control of concrete- Statistical Quality Control- Acceptance criteria- Proportioning of concrete mix by normal and pump able concretes by BIS method, ACI Method, DOE Method, Design of High Strength Concrete mix.

UNIT – V **(9 LECTURES)**

SPECIAL CONCRETES: Light weight concrete mix design-No-fines Concrete- Fiber reinforced concrete-Polymer concrete- Self compacting concrete-Geopolymer Concrete-High Performance Concrete.

LIST OF EXPERIMENTS

Test on Cement

1. Normal Consistency and fineness of cement.
2. Initial setting time and final setting time of cement.
3. Specific gravity of cement
4. Soundness of cement.
5. Compressive strength of cement.

II. Test on Aggregate

1. Sieve Analysis and gradation charts

2. Bulking of sand.
3. Bulk and compact densities of fine and coarse aggregates

III. Test on Fresh Concrete

1. Slump test
2. CF (compact factor test)
3. Vee-bee Test
4. Flow Table Test

Self Compacting Concrete

1. Slump cone
2. V funnel
3. L Box
4. J-Ring

IV. Test on hardened concrete

1. Compression test on cubes
2. Flexure test
3. Splitting Tensile Test

V. Non Destructive test of concrete

1. Rebound hammer
2. Ultrasound pulse Velocity (UPV)

TEXT BOOKS:

1. Concrete Technology by M. S. Shetty. – S. Chand & Co. 2004
2. Properties of Concrete by A. M. Neville Pearson 5th edition Education ltd 2016.
3. Concrete Technology by Job Thomas -Cengage learning India Pvt Ltd 2015.

REFERENCE BOOKS:

1. Concrete Technology by Job Thomas, Cengage Learning
2. Concrete Technology by M.L.Gamghir, Tata McGraw Hill publishers, New Delhi
3. Concrete Technology by A.R.Santakumar, Oxford University Press, New Delhi
4. Concrete Micro structure, Properties and Materials-P.K. Mehta and J.M.Monterio, McGraw Hill publishers

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year II Sem.

CONCRETE TECHNOLOGY

Course Code: **A4106** | **L T P C**

LIST OF EXPERIMENTS | **2 0 2 3**

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VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year II Sem

STRUCTURAL ANALYSIS

Course Code: **A4107**

L	T	P	C
3	0	0	3

SYLLABUS

UNIT – I **(9 LECTURES)**

STATIC AND KINEMATIC INDETERMINACY: Introduction to static and kinematic indeterminacy- analysis of two dimensional and three dimensional frames.

THREE - TWO HINGED ARCHES: Introduction-classification of arches-Analysis of three & two hinged parabolic arches-secondary stress in two hinged arches due to temperature and elastic shortening of rib.

UNIT – II **(9 LECTURES)**

FIXED BEAMS: Analysis of fixed beams with and without varying moments of inertia, 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 Fixed Beams - effect of rotation of a support. Effect of sinking of supports.

CONTINUOUS BEAMS: Introduction - Continuous beams. Clapeyron's theorem of three moments- Analysis of continuous beams with constant and variable moments of inertia with one or both ends fixed - continuous beams with overhang. Effect of sinking of supports.

UNIT – III **(9 LECTURES)**

SLOPE - DEFLECTION METHOD: Derivation of slope- deflection equation, application to continuous beams with and without settlement of supports - Analysis of single Bay - Single storey Portal Frames Including Side Sway - Shear force and bending moment diagrams, Elastic curve.

UNIT – IV **(9 LECTURES)**

MOMENT DISTRIBUTION METHOD: Introduction – distribution theorem – carryover theorem - Application to continuous beams with and without settlement of supports - Analysis of single Bay Single Story Portal Frames including side sway. Shear force and bending moment diagrams, Elastic curve.

UNIT – V **(9 LECTURES)**

KANI'S METHOD: Analysis of continuous beams including settlement of supports. Analysis of single bay single storey and single bay two storey Frames by Kani's Method Including Side sway. Shear force and bending moment diagrams.

TEXT BOOKS:

1. S. Ramamrutham ,Theory of structures, Dhanpat rai publishing company
2. S.S.Bhavikatti, Structural Analysis Vol I & II,Vikas publishing house Pvt. Ltd.

REFERENCE BOOKS:

1. Pundit and Guptha, Structural Analysis Vol I & II Tata McGraw Hill Publishers.
2. Hibbeler, Structural Analysis, pearson Education Ltd
3. C.S.Reddy, Basic Structural Analysis, Tata McGraw Hill Publishers.
4. M.L.Gamhir Fundamentals of structural Analysis, PHI.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CE II Year II Sem

HYDRAULICS AND HYDRAULIC MACHINES

Course Code: **A4108**

L	T	P	C
3	0	2	4

SYLLABUS

UNIT – I **(9 LECTURES)**

OPEN CHANNEL FLOW

Introduction, Classification of Flow in channels, Type of channels, Velocity distribution - Chezy's, Manning's; and Bazin's formulae for uniform flow - Most Economical sections. Specific Energy-Critical, sub-critical and super critical flows. Non-uniform flow-Dynamic equation for G.V.F, direct step method-Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT – II **(9 LECTURES)**

DIMENSIONAL ANALYSIS AND SIMILITUDE

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

UNIT – III **(9 LECTURES)**

HYDRODYNAMIC FORCE OF JETS

Hydrodynamic force exerted by jets on stationary and moving flat, inclined and curved vanes, jet striking centrally on symmetrical and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency of jet, Series of vanes expressions and efficiencies, Angular momentum principle for series of radial curved vanes.

UNIT – IV **(9 LECTURES)**

HYDRAULIC TURBINES

Introduction General Layout of a typical Hydropower Plant, Heads and efficiencies of turbine. Classification of turbines - Pelton wheel, Radial Flow Reaction Turbines-Inward and Outward Radial flow turbines, Francis, Kaplan turbine-working principles, velocity diagrams, work done and efficiency, hydraulic design. Draft tube – theory and function, efficiency. Specific Speed, Unit Quantities, Characteristic Curves of Hydraulic Turbines.

UNIT – V **(9 LECTURES)**

CENTRIFUGAL PUMPS

Introduction, Heads and efficiencies of a Centrifugal Pump, minimum starting speed, specific speed of a pump, multistage pumps-pumps in parallel, series, priming of pump, Characteristic Curves of Hydraulic pumps, NPSH, cavitation in pumps.

List of Experiments:

1. Calibration of Venturimeter& Orifice Meter.
2. Calibration of contracted Rectangular Notch and / Triangular Notch.
3. Determination of friction factor of a pipe and minor losses.
4. Verification of Bernoulli's Equation.
5. Impact of Jet on Vanes.
6. Performance test on Pelton wheel turbine.
7. Performance test on Francis turbine.

8. Performance test on Kaplon turbine.
9. Performance characteristics of a single stage and multi-stage centrifugal pump.
10. Analysis of Hydraulic Jump Characteristics in a rectangular Channel.

TEXT BOOKS:

1. K, Subramanyam Channel flow, Tata Mc.Grawhill Publishers.
2. Dr. R.K. Bansal, A text of Fluid mechanics and hydraulic machines,Laxmi Publications (P) ltd., NewDelhi.
3. D.S. Kumar, Fluid Mechanics & Fluid Power Engineering, Kataria& Sons.

REFERENCE BOOKS:

1. Modi & Seth, Fluid Mechanics, Hydraulic and Hydraulic Machines, Standard book house.
2. Ranga Raju, Elements of Open channel flow, Tata Mc.Graw Hill Publications.
3. Rajput, Fluid mechanics and fluid machines, S.Chand& Co.
4. V.T.Chow, Open Channel flow, Mc. Graw Hill Book Company.
5. Banga& Sharma, Hydraulic Machines, Khanna Publishers.

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B. Tech. CE II Year II Sem

HYDRAULICS AND HYDRAULIC MACHINES

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L	T	P	C
3	0	2	4

SYLLABUS

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10. Analysis of Hydraulic Jump Characteristics in a rectangular Channel.

VARDHAMAN COLLEGE OF ENGINEERING
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B. Tech. CE II Year II Sem

ADVANCED SURVEYING

Course Code: **A4109**

L	T	P	C
1	0	2	2

SYLLABUS

UNIT – I **(3 LECTURES)**

THEODOLITE: Types - Measurement of horizontal and vertical angles - Repetition and Reiteration- Gales traverse table – Errors in theodolite work.

UNIT – II **(3 LECTURES)**

TACHEOMETER: Principle of tachometry –theory of stadia tacheometry-determination of stadia constants-anallactic lens.

UNIT – III **(3 LECTURES)**

TRIGONOMETRIC LEVELLING: Heights and distances.

UNIT – IV **(3 LECTURES)**

CURVES: Types of curves- Methods of setting simple curves.
SETTING OUT WORKS: Introduction-Laying Out buildings, Sewer lines.

UNIT – V **(3 LECTURES)**

INTRODUCTION TO ADVANCED SURVEYING: Electronic theodolite - Total stations- Remote sensing-basic concepts-applications - Introduction to Global Positioning system (GPS) - Introduction to Geographic Information System (GIS).

LIST OF EXPERIMENT

1. Study of theodolite in detail - practice for measurement of horizontal and vertical angles.
2. Measurement of horizontal angles by method of repetition and reiteration.
3. Trigonometric Leveling - Heights and distance problem (Two Exercises)
4. Heights and distance using Principles of tacheometric surveying (Two Exercises)
5. Curve setting different methods. (Two Exercises)
6. Setting out works for buildings & pipe lines.
7. Determination of area using total station
8. Determination of remote height using total station
9. Stake-out using total station
10. Distance, gradient, Difference, height between two inaccessible points using total stations

TEXT BOOKS:

1. R.subramanian, Surveying and levelling,second Edition,Oxford University press-2012.
2. Dr. B.C. Punmia, Surveying, Vol. II, Laxmi Publications Pvt. Ltd, Twenth edition 1994.

REFERENCE BOOKS:

1. Dr. A.M.Chandra, Higher Surveying, New Age International Publishers.
2. Dr. K.R. Arora, Surveying, Vol. II, Standard Book House, Fifth edition, 2001

3. SatheeshGopi. Sathi Kumar and N. Madhu, Advanced Surveying Total station GIS and Remote sensing.

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B. Tech. CE II Year II Sem

ADVANCED SURVEYING

Course Code: **A4109**

L	T	P	C
1	0	2	2

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B. Tech. CE II Year II Sem

GENDER SENSITIZATION

Course Code: **A4013**

L	T	P	C
0	0	2	0

SYLLABUS

1. Gender Sensitization: Why should we study it?

2. Socialization: Making Women, Making Men
   Introduction
   Preparing for womanhood
   Growing up male
   First lessons in caste
   Different masculinities

3. Just Relationships: Being Together as Equals
   Mary Kom and Onler
   Love and Acid just do not mix
   Love letters
   Mothers and fathers
   Further Reading: Rosa Parks-The Brave heart

4. Missing Women: Sex Selection and Its Consequences
   Declining Sex Ratio
   Demographic Consequences

5. Gender Spectrum: Beyond the Binary
   Two or Many?
   Struggles with Discrimination

6. Additional Reading: Our Bodies, Our Health

7. Housework: The Invisible Labour
   "My Mother doesn't work"
   "Share the load"

8. Women's Work: Its Politics and Economics
   Fact and fiction
   Unrecognized and unaccounted work
   Further Reading: wages and conditions of work.

9. Sexual Harassment: Say No!
   Sexual harassment, not eve-teasing
   Coping with everyday harassment
   Further Reading: "Chupulu"

10. Domestic Violence: Speaking Out
    Is home a safe place?
    When women unite (Film)
    Rebuilding lives
    Further Reading: New Forums for justice.

11. Thinking about Sexual Violence
    Blaming the Victim- " I Fought for my life…"
    Further Reading: The caste face of violence.

12. Knowledge: Through the Lens of Gender
    Point of view
    Gender and the structure of knowledge
    Further Reading: Unacknowledged women artists of Telangana

13. Whose History? Questions for Historians and Others
    Reclaiming a Past
    Writing other Histories
    Further Reading: Missing pages from modern Telangana history

TEXT BOOK:

1. Towards a World of Equals: A Bilingual Textbook on Gender. Telugu Akademi, Hyderabad, 2015

ADDITIONAL RESOURCES:

www.worldofequals.org.in