BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

B.TECH CIVIL ENGINEERING BR23- II YEAR COURSE STRUCTURE

B.Tech II Year I Semester

sno	Category	Course Code	Title	L	T	P	Credits
1	BSC	23BS3T01	Numerical Techniques And Statistical Methods	3	0	0	3
2	HSMC	23HM3T01	Universal human values - understanding harmony and Ethical human conduct	2	1	0	3
3	ESC	23ES3T01	Surveying	3	0	0	3
4	PCC	23CE3T02	Strength of Materials	3	0	0	3
5	PCC	23CE3T03	Fluid Mechanics	3	0	0	3
6	PCC	23CE3L04	Surveying Lab	0	0	3	1.5
7	PCC	23CE3L05	Strength of Materials Lab	0	0	3	1.5
8	SEC	23SC3L01	Building Planning and Drawing	0	1	2	2
9	AC	3NC3T01	Environmental Science	2	0	0	0
			Total	16	2	8	20

B.Tech II Year II Semester

S.no	Category	Course Code	Title	L	T	P	Credits
1	HSMC	23HM4T02	Managerial Economics andFinancial Analysis	2	0	0	2
2	ESC	23ES4T07	Engineering Geology	3	0	0	3
3	PCC	23CE4T01	Concrete Technology	3	0	0	3
4	PCC	23CE4T02	Structural Analysis	3	0	0	3
5	PCC	23CE4T03	Hydraulics &Hydraulic Machinery	3	0	0	3
6	PCC	23CE4L04	Concrete Technology Lab	0	0	3	1.5
7	PCC	23CE4L06	Engineering Geology Lab	0	0	3	1.5
8	SEC	23SC4L05	Remote Sensing &GeographicalInformation Systems	0	1	2	2
9	ESC	23ES4L08	Design Thinking & Innovation	1	0	2	2
10	MC	23NC4T02	Building materials andConstruction	3	0	0	0
		23CSPL01	Mandatory Community Service Project Internship of 08 weeks duration during summer vacation				
			Total	**18**	**1**	**10**	**21**

Dr M C S MADAN HOD &BOS, Department of Civil Engineering, BVCITS Batlapalem	Dr G Yesuratnam Professor of Civil Engineering JNTU Kakinada (University Nomine)	Dr A Murali Krishna, Professor, Department of Civil Engineering, IIT Tirupathi.	Dr B Raghuram kadali, Asst Assistant Professor, Department of civil Engineering, NIT Warangal.	Mr P Rajesh Sr Engineer(P)SDVVL Survey &Constructions, Kakinada (Industrial Expert)	Mr Chakradhar Prasad Assistant Professor, Department of civil DNR College of Engineering Technology Bhimavaram. (Alumni Member)

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REGULATION	BR23	L	T	P	C
II B.TECH I SEMESTER	Course Code: 23BS3T01	3	0	0	3
Course Title:	NUMERICAL TECHNIQUES AND STATISTICAL METHODS				

Course Objectives:

1 To elucidate the different numerical methods to solve non-linear algebraicequations.
2To disseminate the use of different numerical techniques for carrying outnumerical integration.
3To familiarize the students with the foundations of probability and statisticalmethods.
4To equip the students to solve application problems in their disciplines.

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

CO	Statement	Blooms level
CO1	. Apply numerical methods to find the solution algebraic and transcendental equations and interpolate the polynomials	L3
CO2	Apply numerical methods to evaluate the definite integrals and to find the solution of initial value problems	L3
CO3	Apply various Probability distributions for both discrete and continuous random variables Apply various Probability distributions for both discrete and continuous random variables	L3
CO4	Compute the mean and variance of samples with and without replacement	L5
CO5	Infer the statistical inferential methods based on small and large sampling tests	L4

UNIT-I: Iterative Methods:

Introduction - Solutions of algebraic and transcendental equations :Bisection method - Secant method - Method of false position - Iteration method - Newton- Raphson method (One variable and simultaneous Equations)
Interpolation: Forward, backward and central difference operators - Properties - Newton's forward and backward formulae for interpolation - Interpolation with unequal intervals - Lagrange's interpolation formula.

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UNIT-II: Numerical integration, Solution of ordinary differential equations with initial conditions:

Trapezoidal rule - Simpson's $1/3^{rd}$ and $3/8^{th}$rule - Solution of initial value problems by Taylor's series - Picard's method of successive approximations - Euler's method - Modified Euler's Method - Runge - Kutta method (second and fourth order) -Milne's Predictor and Corrector Method.

UNIT-III: Probability and Distributions:

Baye's theorem - Random variables - Discrete and Continuous random variables - Distribution functions - Probability mass function, Probability density function and Cumulative distribution functions - Mathematical Expectation and Variance - Binomial, Poisson, Uniform and Gaussian distributions.

UNIT-IV: Sampling Theory for Large & Small Samples:

Introduction - Population and Samples - Sampling distribution of Means and Variance - Point and Interval estimations - Maximum error of estimate - Central limit theorem (without proof).

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 - Test of significance for large samples and Small Samples: Single and two means - Single and two proportions - Student's t- test, F-test, x^2 - test.

Textbooks:

1. **B.S.Grewal,** Higher Engineering Mathematics, 44^{th}Edition, KhannaPublishers.
2. **Miller and Freund's**, Probability and Statistics for Engineers, 7/e, Pearson,2008.

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II B.TECH ISEMESTER	Course Code: 23BS3T01	3	0	0	3
Course Title:	NUMERICAL TECHNIQUES AND STATISTICAL METHODS				

ReferenceBooks:

1. Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineeringand Science, Tata Mc. Graw Hill Education.
2. M. K. Jain, S.R.K.Iyengar and R.K.Jain, Numerical Methods for Scientificand Engineering Computation, New Age International Publications.
3. Lawrence Turyn, Advanced Engineering Mathematics, CRC Press.
4. S.C.Gupta and V.K.Kapoor, Fundamentals of Mathematical Statistics, 11/e,Sultan Chand & Sons Publications, 2012.
5. Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and StatisticsEngineers and the Scientists, 8th Edition, Pearson 2007.
6. Jay l. Devore, Probability and Statistics for Engineering and the Sciences,8th Edition, Cengage.

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REGULATION	BR23				
II B.TECH I SEMESTER	Course Code: 23HM3T01	L	T	P	C
		2	1	0	3
Course Title:	UNIVERSAL HUMAN VALUES - UNDERSTANDING HARMONY ANDETHICAL HUMAN CONDUCT				

Course Objectives:

1 To help the students appreciate the essential complementary between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

2 To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

3 To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature

Course Outcomes:

On Completion of the course, the students will be able to

Cos	STATEMENTS	Blooms level
CO1	Define the terms like Natural Acceptance, Happiness and Prosperity	L1 ,L2
CO2	Identify one's self, and one's surroundings (family, society nature)	L1 ,L2
CO3	Apply what they have learnt to their own self in different day-to-day settings in real life	L3
CO4	Relate human values with human relationship and human society	L4
CO5	Justify the need for universal human values and harmonious existence	L5
CO6	Develop as socially and ecologically responsible engineers	L3,L6

Course Topics

The course has 28 lectures and 14 tutorials in 5 modules. The lectures and tutorials are of 1- hour duration. Tutorial sessions are to be used to explore and practice what has been proposed during the lecture sessions.

The Teacher's Manual provides the outline for lectures as well as practice sessions. The teacher is expected to present the issues to be discussed as propositions and encourage the students to have a dialogue.

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REGULATION	**BR23**				
II B.TECH I SEMESTER	Course Code: 23HM3T01	**L**	**T**	**P**	**C**
		2	1	0	3
Course Title:	**UNIVERSAL HUMAN VALUES - UNDERSTANDING HARMONY ANDETHICAL HUMAN CONDUCT**				

UNIT I Introduction to Value Education (6 lectures and 3 tutorials for practice session)

Lecture 1: Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)
Lecture 2: Understanding Value Education
Tutorial 1: Practice Session PS1 Sharing about Oneself
Lecture 3: self-exploration as the Process for Value Education
Lecture4: Continuous Happiness and Prosperity - the Basic Human Aspirations
Tutorial 2: Practice Session PS2 Exploring Human Consciousness
Lecture 5: Happiness and Prosperity - Current Scenario
Lecture 6: Method to Fulfill the Basic Human Aspirations
Tutorial 3: Practice Session PS3 Exploring Natural Acceptance

UNIT II Harmony in the Human Being (6 lectures and 3 tutorials for practice session)

Lecture 7: Understanding Human being as the Co-existence of the self and the body.
Lecture 8: Distinguishing between the Needs of the self and the body
Tutorial 4: Practice Session PS4 Exploring the difference of Needs of self and body.
Lecture 9: The body as an Instrument of the self
Lecture 10: Understanding Harmony in the self
Tutorial 5: Practice Session PS5 Exploring Sources of Imagination in the self
Lecture 11: Harmony of the self with the body
Lecture 12: Programme to ensure self-regulation and Health
Tutorial 6: Practice Session PS6 Exploring Harmony of self with the body

UNIT III Harmony in the Family and Society (6 lectures and 3 tutorials for practice session)

Lecture 13: Harmony in the Family - the Basic Unit of Human Interaction
Lecture 14: 'Trust' - the Foundational Value in Relationship
Tutorial 7: Practice Session PS7 Exploring the Feeling of Trust
Lecture 15: 'Respect' - as the Right Evaluation
Tutorial 8: Practice Session PS8 Exploring the Feeling of Respect
Lecture 16: Other Feelings, Justice in Human-to-Human Relationship
Lecture 17: Understanding Harmony in the Society
Lecture 18: Vision for the Universal Human Order
Tutorial 9: Practice Session PS9 Exploring Systems to fulfil Human Goal

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REGULATION	BR23				
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		2	1	0	3
Course Title:	UNIVERSAL HUMAN VALUES - UNDERSTANDING HARMONY ANDETHICAL HUMAN CONDUCT				

UNIT IV Harmony in the Nature/Existence (4 lectures and 2 tutorials for practice session)

Lecture 19: Understanding Harmony in the Nature
Lecture 20: Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature
Tutorial 10: Practice Session PS10 Exploring the Four Orders of Nature
Lecture 21: Realizing Existence as Co-existence at All Levels
Lecture 22: The Holistic Perception of Harmony in Existence
Tutorial 11: Practice Session PS11 Exploring Co-existence in Existence

UNIT V Implications of the Holistic Understanding - a Look at Professional Ethics (6 lectures and 3 tutorials for practice session)

Lecture 23: Natural Acceptance of Human Values
Lecture 24: Definitiveness of (Ethical) Human Conduct
Tutorial 12: Practice Session PS12 Exploring Ethical Human Conduct
Lecture 25:A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order
Lecture 26: Competence in Professional Ethics
Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education
Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies
Lecture 28: Strategies for Transition towards Value-based Life and Profession
Tutorial 14: Practice Session PS14 Exploring Steps of Transition towards Universal Human Order
Practice Sessions for UNIT I - Introduction to Value Education
PS1 Sharing about Oneself
PS2 Exploring Human ConsciousnessPS3 Exploring Natural Acceptance
Practice Sessions for UNIT II - Harmony in the Human Being
PS4 Exploring the difference of Needs of self and body
PS5 Exploring Sources of Imagination in the self
PS6 Exploring Harmony of self with the body

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REGULATION	BR23				
II B.TECH I SEMESTER	Course Code: 23HM3T01	L	T	P	C
		2	1	0	3
Course Title:	UNIVERSAL HUMAN VALUES - UNDERSTANDING HARMONY ANDETHICAL HUMAN CONDUCT				

Practice Sessions for UNIT III - Harmony in the Family and Society
PS7 Exploring the Feeling of Trust
PS8 Exploring the Feeling of Respect
PS9 Exploring Systems to fulfil Human Goal

Practice Sessions for UNIT IV - Harmony in the Nature (Existence)
PS10 Exploring the Four Orders of Nature
PS11 Exploring Co-existence in Existence

Practice Sessions for UNIT V - Implications of the Holistic Understanding - a Look at Professional Ethics
PS12 Exploring Ethical Human Conduct
PS13 Exploring Humanistic Models in Education
PS14 Exploring Steps of Transition towards Universal Human Order

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Regulation	**BR23**				
II B.TECH I SEMESTER	**Course Code: 23ES3T01**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**
Course Title:	**SURVEYING**				

Course Objectives:

The objective of this course are to:

1. Know the principle and methods of surveying and measuring of horizontal and vertical-distances and angles
2. Identification of source of errors and rectification methods
3. Know surveying principles to determine areas and volumes
4. Setting out curves and use modern surveying equipments for accurate results
5. Know the basics of Photogrammetry Surveying

Course Outcomes:

Course will enable the student to:

CO	Statement	Blooms level
CO 1	Apply the principle and methods of surveying and measuring of horizontal and vertical- distances and angles	L2
CO 2	Identify the source of errors and rectification methods	L3
CO 3	Apply surveying principles to determine areas and volumes	L2
CO 4	Setting out curves and using modern surveying equipments	L3
CO 5	Apply the basics of Photogrammetry Surveying in field	L4

Syllabus:

UNIT - I

Introduction and Basic Concepts: Introduction, Objectives, classification and principles of surveying, Surveying accessories. Introduction to Compass, leveling and Plane table surveying.

Linear distances- Approximate methods, Direct Methods- Chains- Tapes, ranging, Tape corrections.

Prismatic Compass- Bearings, included angles, Local Attraction, Magnetic Declination, and dip –systems and W.C.B and Q.B systems of locating bearings.

UNIT - II

Leveling- Types of levels, methods of levelling, and Determination of levels, Effect of Curvature of Earth and Refraction.

Contouring- Characteristics and uses of Contours, methods of contour surveying.

Areas - Determination of areas consisting of irregular boundary and regular boundary.

Volumes -Determination of volume of earth work in cutting and embankments for level section, capacity of reservoirs.

UNIT - III

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

Traversing: Methods of traversing, traverse computations and adjustments, Introduction to Omitted measurements.

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		3	0	0	3
Course Title:	SURVEYING				

UNIT - IV

Curves: Types of curves and their necessity, elements of simple, compound, reverse curves. Introduction to Tacheometric Surveying.

Modern Surveying Methods: Principle and types of E.D.M. Instruments, Total station advantages and Applications. Introduction to Global Positioning System. Introduction to Drone survey and Li DAR Survey (Light Detection And Ranging).

UNIT - V

Photogrammetry Surveying:

Introduction, Basic concepts, perspective geometry of aerial photograph, relief and tilt displacements, terrestrial photogrammetry, flight planning; Stereoscopy, ground control extension for photographic mapping- aerial triangulation, radial triangulation, methods; photographic mapping- mapping using paper prints, mapping using stereo-plotting instruments, mosaics, map substitutes.

Text Books:

1. Surveying (Vol – 1 & 2) by Duggal S K, Tata McGraw Hill Publishing Co. Ltd. New Delhi, 5th edition, 2019.
2. Textbook of Surveying by C Venkatramaiah , Universities Press 1st Edition, 2011.

Reference Books:

1. Surveying (Vol – 1), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi, 18th edition 2024.
2. Surveying (Vol – 2), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi 17th 2022.
3. Surveying (Vol – 3), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi 16th 2023.

Web Resources:

https://koha.srmap.edu.in/cgi-bin/koha/opacdetail.pl?biblionumber=11522&shelfbrowse_itemnumber=23066

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Regulation	BR23				
II B.TECH I SEMESTER	Course Code: 23CE3T02	L	T	P	C
		3	0	0	3
Course Title:	STRENGTH OF MATERIALS				

Course Learning Objectives:

1. To Impart Fundamental concepts of Strength of Material and Principles of Elasticity and Plasticity Stress
2. To impart concepts of shear force and bending moment on various types of beams and loading conditions
3. To impart concepts of stresses developed in the cross section and bending equations calculation of section modulus of sections with different cross sections.
4. To the concepts above will be utilized in measuring deflections in beams under various loading and support conditions.
5. To classify cylinders and columns based on their thickness and to derive equations for measurement of stresses across the cross section when subjected to external pressure

Course Outcomes:

At the end of completion of the course, the student will be able

CO	Statement	Blooms level
CO 1	To understand the basic materials behavior under the influence of different external loading conditions and the support conditions.	L2
CO 2	To draw the diagrams indicating the variation of the key performance features like axial forces, bending moment and shear forces in structural members.	L3
CO 3	To acquire knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams	L2
CO 4	To analyze the deflections due to various loading conditions.	L3
CO 5	To assess stresses across section of the thin, thick cylinders and columns to arrive at optimum sections to withstand the internal pressure using Lame's equation	L4

UNIT – I:

Simple Stresses and Strains: Elasticity and plasticity – Types of stresses and strains – Hooke's law – Factor of safety, Poisson's ratio - Relationship between Elastic constants – Bars of varying section – stresses in composite bars.

UNIT – II:

Shear Force and Bending Moment: Definition of beam – Types of beams – Concept of shear force and bending moment – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam; S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed loads, uniformly varying loads, partial uniformly distributed loads, couple and combination of these loads.

UNIT – III:

Flexural and 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 beams

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		3	0	0	3
Course Title:	STRENGTH OF MATERIALS				

Shear Stresses: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, I, T Angle sections.
Torsion – circular shafts only.

UNIT – IV:

Deflection of Beams: Double integration and Macaulay's methods – Determination of slope and deflection for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed loads, uniformly varying loads, partial uniformly distributed loads, couple and combination of these loads. Mohr's theorems – Moment area method – application to simple cases of cantilever.

UNIT – V:

Introduction – Classification of columns – Axially loaded compression members – Euler's crippling load theory – Derivation of Euler's critical load formulae for various end conditions – Equivalent length – Slenderness ratio – Euler's critical stress – Limitations of Euler's theory – Rankine – Gordon formula – Eccentric loading and Secant formula – Prof. Perry's formula.

Thin and Thick cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and volumetric strains – changes in diameter, and volume of thin cylinders. Lames theory for thick cylinders, Derivation of Lames formulae, distribution of hoop and radial stresses across the thickness, compound cylinders distribution of stresses.

TEXTBOOKS:

1. Strength of Materials by R. K. Bansal, Lakshmi Publications, 16th Edition, 2022.
2. Strength of Materials by B. S. Basavarajaiah and P. Mahadevappa, Universities Press 3rd Edition, 2010
3. Strength of Materials by J.K. Gupta and S.K. Gupta, Cengage publications 2nd edition , 2024

REFERENCES:

1. Advanced Mechanics of Solids, L.S Srinath, McGraw Hill Education, 2017, 3rd Edition
2. Strength of Materials - Fundamentals andApplications, T.D.Gunneswara Rao and MudimbyAndal, Cambridge University Press, 2018, 1st Edition
3. Mechanics of Materials, Beer and Johnston, McGraw Hill India Pvt. Ltd., 2020, 8th Edition (SI Units).

Web Resources:

https://youtu.be/GkFgysZC4Vc?si=hsMdNYzlZvAZ3XZg
https://youtu.be/EOGFWIg3mV8?si=ZBWXSg7gJqvkzHU6
https://youtu.be/geqRGNIZGq8?si=PVbnr_egLZkjIrp1
https://youtu.be/DnKG0J_tBso?si=iqq3YaYCa2t_W_WR
https://youtu.be/tXPks3VXUPY?si=7S51oWHqxjezg0Av
https://youtu.be/j3MuFDxRsMo?si=rCC6ACsiCS1Mm4X7

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BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
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DEPARTMENT OF CIVIL ENGINEERING

Regulation	BR23				
II B.TECH I SEMESTER	Course Code: 23CE3T03	L	T	P	C
		3	0	0	3
Course Title:	FLUID MECHANICS				

Course Objectives:

1. To explain basics of statics, kinematics and dynamics of fluids and various measuring techniques of hydrostatic forces on objects.
2. To impart ability to solve engineering problems in fluid mechanics
3. To enable the students measure quantities of fluid flowing in pipes, tanks and channels
4. To teach integral forms of fundamental laws of fluid mechanics to predict relevant pressures, velocities and forces.
5. To strengthen the students with fundamentals useful in application-intensive courses dealing with hydraulics, hydraulic machinery and hydrology in future courses.

Course Outcomes:

On Completion of the course, the students will be able to

Cos	STATEMENTS	Blooms level
CO1	Understand the principles of fluid statics, kinematics and dynamics	L2
CO2	Apply the laws of fluid statics and concepts of buoyancy	L3
CO3	Understand the fundamentals of fluid kinematics and differentiate types of fluid flows	L2
CO4	Apply the Principle of conservation of energy for flow measurement.	L3
CO5	Analyse the losses in pipes and discharge through pipe network.	L4

UNIT - I

Basic concepts and definitions: Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; Variation of viscosity with temperature, Newton law of viscosity; Vapor pressure, Boiling point, Surface tension, Capillarity, Bulk modulus of elasticity, Compressibility

UNIT – II

Fluid statics: Fluid Pressure: Pressure at a point, Pascal's law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U Tube Differential Manometer. Pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces. Buoyancy and stability of floating bodies

UNIT - III

Fluid kinematics:

Classification of fluid flow : steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; one, two and three dimensional flows; Stream line, path line, streak line and stream tube; stream function, velocity potential function. One, two and three - Dimensional continuity equations in Cartesian coordinates.

UNIT - IV

Fluid Dynamics: Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – Derivation; Energy Principle; Practical applications of Bernoulli's equation : Venturimeter, orifice meter and Pitot tube; Momentum principle; Forces exerted by fluid flow on pipe bend; Vortex Flow – Free and Forced; Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number;

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Regulation	BR23				
II B.TECH I SEMESTER	Course Code: 23CE3T03	L	T	P	C
		3	0	0	3
Course Title:	FLUID MECHANICS				

UNIT - V

Analysis Of Pipe Flow: Energy losses in pipelines; Darcy – Weisbach equation; Minor losses in pipelines; Hydraulic Grade Line and Total Energy Line; Concept of equivalent length – Pipes in Parallel and Series.

Textbooks:

1.P. M. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd, 2019.
2. K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2 nd edition 2018

Reference Books:

1. R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th edition, 2024.
2. N. Narayana Pillai, Principles of Fluid Mechanics and Fluid Machines, Universities Press Pvt Ltd, Hyderabad. 3rd Edition 2009.
3. Fluid Mechanics by Frank M. White, Henry Xue, Tata McGraw Hill, 9th edition, 2022.

Online Learning Resources:

https://archive.nptel.ac.in/courses/112/105/112105269/
https://nptel.ac.in/courses/112104118
https://nptel.ac.in/courses/105103192

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Regulation	BR23				
II B.TECH I SEMESTER	Course Code: 23CE3L04	L	T	P	C
		3	0	0	1.5
Course Title:	SURVEYING LAB				

Course Objectives:
By the end of this course student will be able to

1. Know about various linear and angular measuring instruments
2. Take Measurements in the linear and angular view
3. Determine the area and volume by interpreting the data obtained from surveying activities
4. Know modern equipment such as total station
5. Draft field notes from survey data

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

Cos	Statements	Bloom sLevel
CO1	Handle various linear and angular measuring instruments	L2
CO2	Measure the linear and angular measurements	L3
CO3	Calculate the area and volume by interpreting the data obtained from surveying activities	L5
CO4	Handle modern equipment such as total station	L2
CO5	Prepare field notes from survey data	L3

List of Field Works:
Students have to perform any 10 of the following Experiments:

1. Chain survey of road profile with offsets in case of road widening.
2. Determination of distance between two inaccessible points by using compass.
3. Plane table survey ;finding the area of a given boundary by the method of Radiation
4. Fly levelling : Height of the instrument method (differential leveling
5. Fly levelling: rise and fall method.
6. Theodolite survey: determining the horizontal and vertical angles by the method of repetition method
7. Theodolite survey: finding the distance between two in accessible points.
8. Theodolite survey: finding the height of far object.
9. Determination of area perimeter using total station.
10. Determination of distance between two inaccessible point by using total station.
11. Setting out a curve
12. Determining the levels of contours

Student is supposed to do a case study and submit a report as mini project

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Regulation	BR23				
II B.TECH . I SEMESTER	Course Code: 23CE3L05	L	T	P	C
		3	0	0	1.5
Course Title:	STRENGTH OF MATERIALS LAB				

Course objectives: By the end of this course student will be able to

1. To determine the tensile strength and yield parameters of mild steel
2. To find out flexural strengths of Steel/Wood specimens and measure deflections
3. To determine the torsion parameters of mild steel bar
4. To determine the hardness numbers, impact and shear strengths of metals
5. To determine the load-deflection parameters for springs

Course Outcomes:

On Completion of the course, the students will be able to

Cos	Statements	Bloom sLevel
CO1	Conduct tensile strength test and draw stress-strain diagrams for ductile metals	L3
CO2	Perform bending test and determine load-deflection curve of steel/wood	L5
CO3	Able to conduct torsion test and determine torsion parameters	L5
CO4	Perform hardness, impact and shear strength tests and calculate hardness numbers,impact and shear strengths	L3
CO5	Able to conduct tests on closely coiled and open coiled springs and calculate deflections	L3

LIST OF EXPERIMENTS:

Students have to perform any 10 of the following Experiments:

1. Tension test.
2. Bending test on (Steel/Wood) Cantilever beam.
3. Bending test on simply supported beam.
4. Torsion test.
5. Hardness test.
6. Compression test on Open coiled springs
7. Tension test on Closely coiled springs
8. Compression test on wood/ concrete
9. Izod / Charpy Impact test on metals
10. Shear test on metals
11. Use of electrical resistance strain gauges.
12. Continuous beam – deflection test.

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Regulation	BR23				
II B.TECH I SEMESTER	Course Code: 23SC3L01	L	T	P	C
		0	1	2	2
Course Title:	BUILDING PLANNING AND DRAWING				

Course Objectives:

1. Initiating the student to different building bye-laws and regulations.
2. Imparting the planning aspects of residential buildings and public buildings.
3. Giving training exercises on various signs and bonds.
4. Giving training exercises on different building units.
5. Imparting the skills and methods of planning of various buildings.

Course Outcomes:

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

Cos	Statements	Blooms Level
CO1	Plan various buildings as per the building by-laws.	L3
CO2	Distinguish the relation between the plan, elevation and cross section and identify the form and functions among the buildings.	L4
CO3	Draw signs and bonds	L3
CO4	Draw different building units	L6
CO5	Learn the skills of drawing building elements and plan the buildings as per requirements	L3

Syllabus: Students have to perform all the Experiments:

1. Detailing & Drawing of Sign Conventions.
2. Detailing & Drawing of English Bond.
3. Detailing & Drawing of Flemish Bond.
4. Detailing & Drawing of Doors.
5. Detailing & Drawing of Windows.
6. Detailing & Drawing of Ventilators &Roofs.
7. Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws.
8. Drawing of Plan, Elevation & Section from line diagram for a single Storey Building.
9. Drawing of Plan, Elevation & Section for Hospital Building.
10. Drawing of Plan, Elevation & Section for Industrial Building.

Text Books:

1. Planning, designing and Scheduling, Gurcharan Singh and Jagdish Singh
2. Building planning and drawing by M. Chakraborti.
3. Building drawing, M G Shah, C M Kale and S Y Patki, Tata McGraw Hill, New Delhi.

Reference Books:

1. National Building Code 2016 (Volume- I & II).
2. Principles of Building Drawing, M G Shah and C M Kale, Trinity Publications, New Delhi.
3. Civil Engineering drawing and House planning, B. P. Verma, Khanna publishers, NewDelhi.
4. Civil Engineering Building practice, Suraj Singh: CBS Publications, New Delhi, and Chennai

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Regulation	BR23				
II B.TECH I Semester	Course Code: 23NC3T01	L	T	P	C
		2	0	0	0
Course Title:	ENVIRONMENTAL SCIENCE				

Course Objectives:

1. To make the students to get awareness on environment
2. To understand the importance of protecting natural resources, ecosystems for future
3. generations and pollution causes due to the day-to-day activities of human life
4. To save earth from the inventions by the engineers

Course Outcomes:

Cos	Statements	Blooms Level
CO1	Grasp multi disciplinary nature of environmental studies and various renewable and non-renewable resources.	L2
CO2	Understand flow and bio-geo- chemical cycles and ecological pyramids.	L2
CO3	Understand various causes of pollution and solid waste management and related preventive measures.	L2
CO4	Understand the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.	L2
CO5	Illustrate the causes of population explosion, value education and welfare programmes.	L3

UNIT – I

Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.

Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies - Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams - benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. - Energy resources:

UNIT – II

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem - Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use,

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Regulation	BR23				
II B.TECH I Semester	Course Code: 23NC3T01	L	T	P	C
		2	0	0	0
Course Title:	ENVIRONMENTAL SCIENCE				

Productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels - India as a mega-diversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – III

Environmental Pollution: Definition, Cause, effects and control measures of:

a. Air Pollution.
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV

Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies - Environmental ethics: Issues and possible solutions - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. - Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT – V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies. Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural

Study of common plants, insects, and birds – river, hill slopes, etc.

Textbooks:

1. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
2. Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
3. S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.

Reference Books:

1. Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e, Cengage Publications, 2012.

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Regulation	BR23				
II B.TECH I Semester	Course Code: 23NC3T01	L	T	P	C
		2	0	0	0
Course Title:	ENVIRONMENTAL SCIENCE				

2. M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BS Publication, 2014.
3. J.P. Sharma, Comprehensive Environmental studies, Laxmi publications, 2006.
4. G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House, 2018.

Online Learning Resources:

- https://onlinecourses.nptel.ac.in/noc23_hs155/preview
- https://www.edx.org/learn/environmental-science/rice-university-ap-r-environmentalscience part-3-pollution-and-resources?index=product&objectID=course-3a6da9f2-d84c-4773-8388-1b2f8f6a75f2&webview=false&campaign=AP%C2%AE+Environmental+Science++Part+3%3A+Pollution+and+Resources&source=edX&product_category=course&placement_url=https%3A%2F%2Fwww.edx.org%2Flearn%2Fenvironmental-science
- http://ecoursesonline.iasri.res.in/Courses/Environmental%20Science-I/Data%20Files/pdf/lec07.pdf
- https://www.youtube.com/watch?v=5QxxaVfgQ3k

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REGULATION	BR23				
II B.TECH II Semester	Course Code: 23HM4T02	L	T	P	C
		2	0	0	2
Course Title:	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS				

Course Objectives:

1. To inculcate the basic knowledge of microeconomics and financial accounting
2. To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost
3. To Know the Various types of market structure and pricing methods and strategy
4. To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
5. To provide fundamental skills on accounting and to explain the process of preparing financial statements.

CourseOutcomes:

Uponthesuccessfulcompletionofthiscourse,thestudentswillbeableto:

Cos	Statements	Blooms level
CO1	Define the concepts related to Managerial Economics, financial accounting and management	L2
CO2	Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets	L2
CO3	Apply the Concept of Production cost and revenues for effective Business decision	L3
CO4	Analyze how to invest their capital and maximize returns	L4
CO5	Evaluate the capital budgeting techniques	L5
CO6	Develop the accounting statements and evaluate the financial performance of business entity	L5

UNIT - I Managerial Economics

Introduction - Nature, meaning, significance, functions, and advantages. Demand- Concept, Function, Law of Demand - Demand Elasticity- Types - Measurement. Demand Forecasting- Factors governing Forecasting, Methods. Managerial Economics and Financial Accounting and Management.

UNIT - II Production and Cost Analysis

Introduction - Nature, meaning, significance, functions and advantages. Production Function- Least- cost combination- Short run and long run Production Function- Isoquants and Is costs, Cost & Break-Even Analysis - Cost concepts and Cost behaviour- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems).

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REGULATION	BR23				
II B.TECH II Semester	Course Code: 23HM4T02	L	T	P	C
		2	0	0	2
Course Title:	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS				

UNIT - III Business Organizations and Markets

Introduction - Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition- Oligopoly-Price-Output Determination - Pricing Methods and Strategies

UNIT - IV Capital Budgeting

Introduction - Nature, meaning, significance. Types of Working Capital, Components, Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting- Features, Proposals, Methods and Evaluation. Projects - Pay Back Method, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return(IRR) Method (sample problems)

UNIT - V Financial Accounting and Analysis

Introduction - Concepts and Conventions- Double-Entry Bookkeeping, Journal, Ledger, TrialBalance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Introduction to Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

Textbooks:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:

1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, NewAge International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt
https://www.slideshare.net/rossanz/production-and-cost-45827016
https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

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Regulation	**BR23**				
II B.TECH II Semester	**Course Code: 23ES4T07**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**
Course Title:	**ENGINEERING GEOLOGY**				

Course Learning Objectives:

The objective of this course is:

1. To know the importance of Engineering Geology to the Civil Engineering.
2. To enable the students understand what minerals and rocks are and their formation and identification.
3. To highlight significance/ importance/ role of Engineering Geology in construction of Civil Engineering structures.
4. To enable the student realize its importance and applications of Engineering Geology in Civil Engineering constructions.
5. concepts of Groundwater and its geophysical methods.

Course Outcomes:

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

Cos	Statements	Blooms level
CO1	Understand the significance of geological agents on Earth surface and its significancein Civil Engineering.	L2
CO2	Identify and understand the properties of Minerals and Rocks.	L2
CO3	Understand the concepts of Groundwater and its geophysical methods.	L2
CO4	Classify and measure the Earthquake prone areas, Landslides and subsidence topractice the hazard zonation.	L4
CO5	Investigate the project site for mega/mini civil engineering projects and site selectionfor mega engineering projects like Dams, Reservoirs and Tunnels.	L4

SYLLABUS:

UNIT-I: Introduction: Branches of Geology, Importance of Geology in Civil Engineering with case studies, Weathering of rocks, Geological agents, weathering process of Rock, Soil Mineralogy, Rivers andgeological work of rivers.

UNIT-II Mineralogy And Petrology: Definitions of mineral and rock-Different methods of study of mineraland rock. Physical properties of minerals and rocks for megascopic study for the following minerals and rocks. Common rock forming minerals: Feldspar, Quartz Group, Olivine, Augite, Hornblende, Mica Group, Asbestos, Talc, Chlorite, Kyanite, Garnet, Calcite and ore formingminerals are Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Chromite, Magnetite and Bauxite. Classification, structures, textures and forms of Igneous rocks, Sedimentary rocks, Metamorphic rocks, and their megascopic study of granite varieties, (pink, gray, green). Pegmatite, Dolerite, Basalt etc., Shale, Sand Stone, Lime Stone, Laterite, Quartzite,Gneiss, Schist, Marble, Khondalite and Slate.

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BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

Regulation	BR23				
II B.TECH II Semester	Course Code: 23ES4T07	L	T	P	C
		3	0	0	3
Course Title:	ENGINEERING GEOLOGY				

UNIT-III

Structural Geology: Strike , Dip and Outcrop study of common geological structures associating with the rocks such as Folds, Faults, Joints and Unconformities- parts, types, mechanism and their importance in Civil Engineering.

UNIT-IV

Ground Water: Water table, Cone of depression, Geological controls of Ground Water Movement, Ground Water Exploration Techniques.

Earthquakes and Land Slides: Terminology, Classification, causes and effects, Shield areas and Seismic bells, Richter scale intensity, Precautions of building constructions in seismic areas. Classification of Landslides, Causes and Effects, measures to be taken prevent their occurrence at Landslides.

Geophysics: Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods and Engineering properties of rocks.

UNIT-V

Geology of Dams, Reservoirs and Tunnels: Types and purpose of Dams, Geological considerations in the selection of a Dam site. Geology consideration for successful constructions of reservoirs, Life of Reservoirs. Purpose of Tunnelling, effects, Lining of Tunnels. Influence of Geology for successful Tunnelling.

TEXT BOOKS:

1. Engineering Geology by N. ChennaKesavulu, Laxmi Publications . 2ndEdn 2014.
2. Engineering & General Geology by Parbin Singh Katson educational series 8th 2023

REFERENCES:

1. Engineering Geology by SubinoyGangopadhay Oxford University press 1st edition, 2012.
2. Engineering Geology by D. Venkat Reddy, Vikas Publishing, 2ndEdn , 2017,
3. Geology for Engineers and Environmental Society' Alan E Kehew, 3rd edn., 2013) Pearson publications.
4. 'Environmental Geology' (2013) K.S.Valdiya, 2nd ed., McGraw Hill Publications.

Web Materials:

1. http://nptel.iitm.ac.in/video.php?subjectId=105105106
2. http://nptel.iitm.ac.in/video.php?courseId=1055&p=1
3. http://nptel.iitm.ac.in/video.php?courseId=1055&p=3
4. http://nptel.iitm.ac.in/video.php?courseId=1055&p=4

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Regulation	BR23	L	T	P	C
II B.TECH II Semester	Course Code: 23CE4T01	3	0	0	3
Course Title:	CONCRETE TECHNOLOGY				

Course Learning Objectives

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

1. Learn materials and their properties used in the production of concrete
2. Learn the behavior of concrete at fresh stage
3. Learn the behavior of concrete at hardened stage
4. Learn the influence of elasticity, creep and shrinkage on concrete
5. Learn the mix design methodology and special concretes

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

Cos	Statements	Blooms level
CO1	Familiarise the basic ingredients of concrete and their role in the production ofconcrete and its behaviour in the field.	L2
CO2	Test the fresh concrete properties and the hardened concrete properties. Understand the basic concepts of concrete. Design the concrete mix by BIS method.	L3
CO3	Evaluate the ingredients of concrete through lab test results. realise the importanceof quality of concrete	L4
CO4	Understand the behaviour of concrete in various environments.	L2
CO5	Familiarize the basic concepts of special concrete and their production andapplications.	L3

Detailed Syllabus:

UNIT- I CEMENTS: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrate cement – Test for physical properties – Different grades of cements – Admixtures – Mineral and chemical admixtures – accelerators, retarders, air entrainers, plasticizers, super plasticizers,fly ash and silica fume

AGGREGATES: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand – Deleterioussubstances – Soundness – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates– Maximum aggregate size- Quality of mixing water

UNIT- II FRESH CONCRETE: Steps in Manufacture of Concrete–proportion, mixing, placing, compaction, finishing, curing – including various types in each stage. Properties of fresh concrete-Workability – Factors affecting workability –

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DEPARTMENT OF CIVIL ENGINEERING

Regulation	BR23				
II B.TECH II Semester	Course Code: 23CE4T01	L	T	P	C
		3	0	0	3
Course Title:	CONCRETE TECHNOLOGY				

Measurement of workability by different tests, Setting times of concrete, Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete, Ready mixed concrete, Shotcrete

UNIT- III HARDENED CONCRETE: Water / Cement ratio – Abram's Law – Gel/spaceratio – 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 test – Tension test –Factors affecting strength – Flexure test –Splitting test – Non-destructive testing methods – Codal provisions for NDT.

UNIT- IV ELASTICITY, CREEP & SHRINKAGE – Modulus of elasticity – Dynamic modulus of elasticity – Poisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage – types of shrinkage.

UNIT- V MIX DESIGN AND SPECIAL CONCRETES: Ready mixed concrete, Fibre reinforced concrete – Different types of fibres – Factors affecting properties of FRC, Highperformance concrete – Self consolidating concrete, Self healing concrete. Factors in the choice of mix proportions –Quality control of concrete- Statistical methods- Acceptance Criteria-Concepts Proportioning of concrete mixes by ACImethod and IS Code method

TEXT BOOKS

1. Properties of Concrete by A.M. Neville – PEARSON – 4th edition
2. Concrete Technology by M.L. Gambhir. – Tata Mc.Graw Hill Publishers, New Delhi 5th edition2013.
3. Concrete Technology by Job Thomas, Cengagae Publications, 1st edition, 2015

REFERENCES

1. Concrete Microstructure, Properties of Materials by P.K. Mehta and Moterio. McGraw Hill 4thedition 2014
2. Concrete Technology, J.J. Brooks and A. M. Neville, Pearson, 2019, 2nd Edition.
3. Concrete Technology by M. S. Shetty. – S. Chand & Co.; 2004

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			12-13-22		

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DEPARTMENT OF CIVIL ENGINEERING

Regulation	BR23				
II B.TECH II Semester	Course Code: 23CE4T02	L	T	P	C
		3	0	0	3
Course Title:	STRUCTURAL ANLAYSIS				

Course Learning Objectives

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

1. Learn energy theorems
2. Learn the analysis of indeterminate structures
3. Analysis of fixed and continuous beams
4. Learn about slope-deflection method
5. Learn about Moment – distribution method

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

Cos	Statements	Blooms level
CO1	Apply energy theorems to analyze trusses	L3
CO2	Analyze indeterminate structures by using Castigliano's-II theorem	L4
CO3	Analysis of fixed and continuous beams	L4
CO4	Analyze continuous beams and portal frames by using slope-deflection method	L4
CO5	Analyze continuous beams and portal frames by using Moment – distribution Method	L4

UNIT – I

ANALYSIS OF INDETERMINATE STRUCTURES: Indeterminate Structural Analysis – Determination of static and kinematic indeterminacies – Solution of trusses with upto two degrees of internal and external indeterminacies **Lateral Load Analysis Using Approximate Methods**: application to building frames. (i) Portalmethod (ii) Cantilever method.

UNIT – II FIXED BEAMS & CONTINUOUS BEAMS: Introduction to statically indeterminate beams with 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 momentdiagrams – Deflection of fixed beams effect of sinking of support, effect of rotation of a support.

UNIT – III SLOPE-DEFLECTION METHOD: Introduction-derivation of slope deflection equations applicationto continuous beams with and without settlement of supports - Analysis of single bayportal frames without sway.

UNIT – IV MOMENT DISTRIBUTION METHOD: Introduction to moment distribution method- Application to continuous beams with and without settlement of supports-Analysis of single bay storey portal frames without sway.

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Regulation	BR23				
IIB.TECH II Semester	Course Code: 23CE4T02	L	T	P	C
		3	0	0	3
Course Title:	STRUCTURAL ANLAYSIS				

UNIT – V Kani's Method: Analysis of continuous beams – including settlement of supports and single bay portal frames with and without side sway

Introduction to Matrix Methods: Flexibility methods: Introduction, application to continuousbeams- Stiffness method: Introduction, application to continuous beams.

Textbooks:

1. Analysis of Structures - Vol-I&II by V.N.Vazirani&M.M.Ratwani, Khanna Publications, NewDelhi.
2. Basic Structural Analysis by C.S.Reddy., Tata McGraw Hill Publishers. 3rd edition 2017.
3. Structural Analysis SI addition RC Hibbeler 2019

Reference Books:

1. Structural analysis by Aslam Kassimali Cengage publications 6th edition 2020.
2. Structural analysis Vol.I and II by Dr.R.Vaidyanathan and Dr.PPerumal– Laxmi publications.3rd 2016
3. Introduction to structural analysis by B.D.Nautiyal, New Age international publishers, NewDelhi.

Web Materials:

1.https://youtu.be/qhEton-EEOw?si=gQKjeHD9aeolNx67
2. https://youtu.be/s-n_QqH96ks?si=9tUlAR-0T4yXtQB6
3. https://www.youtube.com/watch?v=l80MbMhthrM
4. https://youtu.be/ScjLYr2WtxE?list=PLUogGZJOiMtNOus85Tq1zNvg9EU3aJ8VO
5. https://youtu.be/clFyMj-XFVE?list=PLUogGZJOiMtNOus85Tq1zNvg9EU3aJ8VO
6. https://youtu.be/ELXjh51p7dc?list=PLUogGZJOiMtNOus85Tq1zNvg9EU3aJ 8VO 7.https://youtu.be/XZaax4Qv7hQ
8. https://youtu.be/qhEton-EEOw

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Regulation	**BR23**				
IIB.TECH II Semester	**Course Code: 23CE4T03**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**
Course Title:	**HYDRAULICS AND HYRAULIC MACHINERY**				

Pre-requisite: Fluid MechanicsCourse

Objectives:

1. To Introduce concepts of laminar and turbulent flows
2. To teach principles of uniform flows through open channel.
3. To teach principles of non-uniform flows through open channel.
4. To impart knowledge on design of turbines.
5. To impart knowledge on design of pumps

Course Outcomes:

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

Cos	Statements	Blooms level
CO1	Understand the characteristics of laminar and turbulent flows.	L2
CO2	Apply the knowledge of fluid mechanics to address the uniform flow problems in open channels.	L3
CO3	Solve non-uniform flow problems and hydraulic jump phenomenon in open channel flows.	L3
CO4	Evaluate the performance of impact of jets on plates and designPelton wheel, Francis and Kaplan turbine	L5
CO5	Understand the principles, losses and its efficiencies of centrifugal pumps.	L2

UNIT – I

Laminar & Turbulent flow in pipes: Laminar Flow- Laminar flow through: circular pipes, annulus and parallel plates. Stoke's law, Measurement of viscosity. Reynolds experiment, Transition from laminar to turbulent flow. Resistance to flow of fluid in smooth and rough pipes-Moody's diagram– Introduction to boundary layer theory.

UNIT – II Uniform flow in Open Channels: Open Channel Flow - Comparison between open channel flow and pipe flow, geometrical parameters of a channel, classification of open channels, classification of open channel flow, Velocity Distribution of channel section. Hydraulically efficient channel sections: Rectangular, trapezoidal and triangular channels, Energy and Momentum correction factors

UNIT – III Non-Uniform flow in Open Channels: Specific energy, critical flow, discharge curve, Specific force, Specific depth, and Critical depth. Measurement of Discharge and Velocity – Gradually Varied Flow- Dynamic Equation of Gradually Varied Flow. Hydraulic Jump and classification -Elements and characteristics- Energy dissipation.

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DEPARTMENT OF CIVIL ENGINEERING

Regulation	**BR23**	**L**	**T**	**P**	**C**
IIB.TECH II Semester	**Course Code: 23CE4T03**	**3**	**0**	**0**	**3**
Course Title:	**HYDRAULICS AND HYRAULIC MACHINERY**				

UNIT - IV

Impact of Jets: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes - Velocity triangles at inlet and outlet - Work done and efficiency Hydraulic Turbines: Classification of turbines; pelton wheel and its design. Francis turbine and its design - efficiency - Draft tube: theory - characteristic curves of hydraulic turbines. Cavitation: causes and effects.

UNIT – V

pumps: Working principles of a centrifugal pump, work done by impeller; heads, losses and efficiencies; minimum starting speed; Priming; specific speed; limitation of suction lift, net positive suction head (NPSH); Performance and characteristic curves; Cavitation effects; Multistage centrifugal pumps; troubles and remedies

TEXT BOOKS: -

1. P. M. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd, 2019.
2. K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2nd edition 2018

Reference Books:

1. R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th edition, 2024.
2. Fluid Mechanics by Frank M. White, Henry Xue, Tata McGraw Hill, 9th edition , 2022.
3. C. S. P. Ojha, R. Berndtsson and P. N. Chadramouli, Fluid Mechanics and Machinery, Oxford University Press, 2010.
4. Introduction to Fluid Mechanics & Fluid Machines by S K Som, Gautam Biswas, S Chakraborty 3rd edition 2011

Online Learning Resources:

https://nptel.ac.in/courses/105105203
https://archive.nptel.ac.in/courses/112/106/112106300/
https://archive.nptel.ac.in/courses/112/103/112103249/

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Regulation	**BR23**				
IIB.TECH II Semester	**Course Code: 23CE4L04**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**1.5**
Course Title:	**CONCRETE TECHNOLOGY LABORATORY**				

Course Learning Objectives
Upon successful completion of this course, the student will be able to
To test basic properties of ingredients of concrete fresh and hardened concrete properties

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

Cos	Statements	Blooms level
CO1	Outline importance of testing cement and its properties	L2
CO2	Assess different properties of Aggregates	L2
CO3	Assess fresh concrete properties and their relevance to hardened concrete	L3
CO4	Assess hardened concrete properties	L4
CO5	To Evaluate the Non-destructive testing on hardened concrete.	L5

Detailed Syllabus: Students have to perform any 10 of the following Experiments:

1. Tests on Cement
- Normal Consistency and Fineness of cement.
- Initial setting time and Final setting time of cement.
- Specific gravity and soundness of cement.
- Compressive strength of cement.

2. Tests on Fine Aggregates
- Grading and fineness modulus of Fine aggregate by sieve analysis.
- Specific gravity of fine aggregate
- Water absorption and Bulking of sand.

3. Tests on Coarse Aggregates
- Grading of Coarse aggregate by sieve analysis.
- Specific gravity of coarse aggregate
- Water absorption of Coarse aggregates

4. Tests on fresh Concrete
- Workability of concrete by compaction factor method
- Workability of concrete by slump test
- Workability of concrete by Vee-bee test.

5. Tests on Hardened Concrete
- Compressive strength of cement concrete and Modulus of rupture
- Young's Modulus and Poisson's Ratio
- Split tensile strength of concrete.
- Non-Destructive testing on concrete (for demonstration)

*Student is supposed to do a case study and submit a report as mini project

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Regulation	BR23	L	T	P	C
IIB.TECH II Semester	Course Code: 23CE4L06	0	0	3	1.5
Course Title:	ENGINEERING GEOLOGY LABORATORY				

Course Learning Objectives:

The objective of this course is:

1. To identify the Megascopic types of Ore minerals & Rock forming minerals.
2. To identify the Megascopic types of Igneous, Sedimentary, Metamorphic rocks.
3. To identify the topography of the site & material selection

Course Outcomes:

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

Cos	Statements	Blooms level
CO1	Identify Megascopic minerals & their properties.	L3
CO2	Identify Megascopic rocks & their properties.	L3
CO3	Identify the site parameters such as contour, slope & aspect for topography.	L3
CO4	Know the occurrence of materials using the strike & dip problems.	L4
CO5	To understand the geological map	L4

Students have to perform any 10 of the following Experiments:

LIST OF EXPERIMENTS

1. Physical properties of minerals: Mega-scopic identification of
   a. Rock forming minerals – Quartz group, Feldspar group, Garnet group, Mica group & Talc, Chlorite, Kyanite, Asbestos, Calcite, Gypsum, etc...
   b. Ore forming minerals – Magnetite, Hematite, Pyrite, Pyralusite, Graphite, etc...
2. Megascopic description and identification of rocks.
   a) Igneous rocks–Types of Granite,Pegmatite, Gabbro, Dolerite, Syenite, Granite, Basalt, etc.
   b) Sedimentary rocks – Sand stone, Lime stone, Shale, Laterite, Conglamorate, etc.
   c) Metamorphic rocks – Biotite – Granite Gneiss, Slate, Muscovite & Biotiteschist, Marble, Khondalite, etc.
3. Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.
4. Simple Structural Geology problems.
5. Bore hole data- A problem on Strike and Dip to a given data
6. Strength of the rock using laboratory tests.
7. Field work – To identify Minerals, Rocks, Geomorphology& Structural Geology.

LAB EXAMINATION PATTERN:

1. Description and identification of FOUR minerals
2. Description and identification of FOUR (including igneous, sedimentary and metamorphic rocks)
3. ONE Question on Interpretation of a Geological map along with a geological section.
4. TWO Questions on Simple strike and Dip problems.
5. Bore hole problems.

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6. Project report on geology.

Regulation	**BR23**				
II B.TECH II Semester	**Course Code: 23CE4L06**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**1.5**
Course Title:	**ENGINEERING GEOLOGY LABORATORY**				

REFERENCES:

1. 'Applied Engineering Geology Practicals' by M T Mauthesha Reddy, New Age International Publishers, 2nd Edition.
2. 'Foundations of Engineering Geology' by Tony Waltham, Spon Press, 3rd edition, 2009.

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			K-13-Pr	P. Rajesh	

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Regulation	BR23				
		L	T	P	C
II B.TECH II Semester	Course Code: 23SC4L05	0	1	2	2
Course Title:	REMOTE SENSING AND GIS				

Course Learning Objectives:

1. The course is designed to
2. Introduce the basic principles of Remote Sensing and GIS techniques and its applicationto Civil Engineering.
3. Learn various types of sensors and platforms and understand the principles of spatialanalysis techniques in GIS.
4. Introduce GIS software to understand the process of digitization, creation of thematic mapfrom toposheets and maps

Course outcomes

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

COs	Statements	Blooms Level
CO1	Acquire knowledge about concepts of remote sensing, sensors and their Characteristics.	L2
CO2	Familiarize with data models and data structures to introduce various Rasterand Vector Analysis capabilities in GIS.	L2
CO3	Digitize and create thematic map and extract important features to calculate geometry.	L3
CO4	Perform surface analysis over Contour to develop digital elevation model.	L4
CO5	Use GIS software to perform simple analysis in water resources and transportation engineering.	L4

SYLLABUS:

UNIT – I Introduction to Remote sensing: History of Remote Sensing, Electromagnetic Radiation, Electromagnetic Spectrum, Energy Interaction with Atmosphere, Energy Interaction with theEarth Surfaces - Characteristics of Remote Sensing Systems, Sensor Resolutions, Advantages &Limitations - Platforms: Types of Sensors, Airborne Remote Sensing, Spaceborne Remote Sensing
- IRS, LANDSAT, SPOT & Recent satellite.

UNIT – II Digital Image analysis: Digital Image Characteristics, Digital Image Data Formats, Band Interleaved by Pixel (BIP), Band Interleaved by Line (BIL), Band Sequential (BSQ) – Visual Interpretation Elements, Preprocessing, Enhancement, Classification, Supervised classification, Unsupervised classification.

UNIT – III Introduction to Geographic Information System: Principles, Components and Applications of GIS- Map projections, Spatial Data Structures, Raster and Vector Data Formats, Data Inputs, Data Manipulation, Data Retrieval, Data Analysis - Spatial data analysis: Overlay Function-VectorOverlay Operations, Raster Overlay Operations, Arithmetic Operators, Comparison and Logical Operators, Conditional Expressions - Network Analysis: Components of network, Transportationnetwork - Optimum path analysis.

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			K. B. Raj		

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

Regulation	**BR23**				
II B.TECH II Semester	**Course Code: 23ES4L08**	**L**	**T**	**P**	**C**
		1	**0**	**2**	**2**
Course Title:	**DESIGN THINKING & INNOVATION**				

Course Objectives: The objectives of the course are to

1. Bring awareness on innovative design and new product development.
2. Explain the basics of design thinking.
3. Familiarize the role of reverse engineering in product development.
4. Train how to identify the needs of society and convert into demand.
5. Introduce product planning and product development process.

Course Outcomes:

COs	Statements	Blooms Level
CO1	Define the concepts related to design thinking.	L1
CO2	Explain the fundamentals of Design Thinking and innovation.	L2
CO3	Apply the design thinking techniques for solving problems in various sectors.	L3
CO4	Analyse to work in a multidisciplinary environment.	L4
CO5	Evaluate the value of creativity.	L5

UNIT - I Introduction to Design Thinking:Introduction to elements and principles of Design, basics of design-dot, line, shape, form asfundamental design components. Principles of design. Introduction to design thinking, history ofDesign Thinking, New materials in Industry.

UNIT - II Design Thinking ProcessDesign thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development

Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT - III InnovationArt of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and valueof creativity.

Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

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Regulation	BR23				
		L	T	P	C
II B.TECH II Semester	Course Code: 23SC4L05	0	1	2	2
Course Title:	REMOTE SENSING AND GIS				

TEXT BOOKS:

1. BasudebBhatta (2021). 'Remote sensing and GIS', 3rdedn., Oxford University Press.
2. S. Kumar, (2016) 'Basics of Remote sensing & GIS', Laxmi Publications.
3. Lillesand, T.M, R.W. Kiefer and J.W. Chipman (2022) 'Remote Sensing and Image Interpretation', 7thedn., Wiley India Pvt. Ltd.

List of Experiments:

Expt. 1: Georeferencing a Toposheet or Map
Expt. 2: Digitization and Attribute table creation.
Expt. 3: Creation of Thematic Map
Expt. 4 : Calculation of Feature geometry – Length, Area & Perimeter.
Expt. 5 : Contour map – developing TIN & DEM from Contour.
Expt. 6 : Stream network – Stream ordering map.
Expt. 7 : Watershed - calculate Hydro-geomorphological parameters.
Expt. 8 : Transportation Network Map – Route analysis.

GIS SOFTWARE: QGIS / ArcGIS

Textbook for Practical

1. QGIS User Guide
2. ArcGIS User Manual by ESRI

REFERENCES:

1. Schowengerdt, R. A (2006) 'Remote Sensing', Elsevier publishers.
2. Burrough P A and R.A. McDonnell, (1998) 'Principals of Geographical Information Systems', Oxford University Press.
3. George Joseph (2013) 'Fundamentals of Remote Sensing', Universities Press.

Web references:

1. https://nptel.ac.in/courses/10510319

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Regulation	**BR23**				
II B.TECH II Semester	**Course Code: 23NC4T02**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**0**
Course Title:	**BUILDING MATERIALS AND CONSTRUCTION**				

Aim and Objective of this course

1. To introduce various building construction materials
2. To describe various properties of masonry, types.
3. To explain various types of cements and their importance and properties.
4. To Explain various building components
5. To describe the various types of finishing's

Course Outcomes:

COs	**Statements**	**Blooms Level**
CO1	Know various engineering properties of building construction materials and suggest their suitability	L1
CO2	Identify the functional role of masonry and its importance	L2
CO3	Acquire and apply fundamental knowledge about cement and lime	L3
CO4	know about the components of the buildings	L4
CO5	Identify the different types of finishing And paint	L5

UNIT –I STONES, BRICKS, TILES, WOOD AND PAINTS

Stones: Classification of Stones – Properties of stones in structural requirements.

Bricks: Composition of good brick earth, various methods of manufacturing of bricks.

Tiles: Characteristics of good tile – Manufacturing methods, Types of tiles.

Wood: Structure – Properties – Seasoning of timber – Classification of various types of woods used in buildings – Defects in timber Paints: White washing and distempering, Constituents of paint – Types of paints – Painting of new and old wood – Varnish.

UNIT. II MASONRYTypes of masonry, English and Flemish bonds, Rubble and Ashlar Masonry. Cavity and partitionwalls.

WOOD: Structure – Properties- Seasoning of timber- Classification of various types of woods used in buildings- Defects in timber. Alternative materials for wood – Galvanized Iron, Fiver – Reinforced Plastics, Steel, Aluminium.

UNIT. III LIME AND CEMENT SUPPLEMENTATIONARY MATERIALS

Lime: Various ingredients of lime – Constituents of lime stone – classification of lime – various methods of manufacture of lime. Cement Supplementary materials like Silica fume, Flyash, GGBS, Rice husk ash used and properties.

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		1	0	2	2
Course Title:	DESIGN THINKING & INNOVATION				

UNIT - IV Product Design Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.

Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT - V Design Thinking in Business Processes Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business - Business challenges: Growth, Predictability, Change, Maintaining Relevance Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.

Activity: How to market our own product, about maintenance, Reliability and plan for startup.

Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, IJniversal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

Online Learning Resources:

- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

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Regulation	BR23				
II B.TECH II Semester	Course Code: 23NC4T02	L	T	P	C
		3	0	0	0
Course Title:	BUILDING MATERIALS AND CONSTRUCTION				

UNIT. IV BUILDING COMPONENTS Lintels, arches, vaults, stair cases – types. Different types of floors – Concrete, Mosaic, Terrazzofloors, Pitched, flat roofs. Lean to roof, Coupled Roofs. Trussed roofs – King and Queen post Trusses. R.C.C Roofs, Madras Terrace and Pre-fabricated roofs.

UNIT.V FINISHINGS Damp Proofing and water proofing materials and uses – Plastering Pointing, white washing and

distempering – Paints: Constituents of a paint – Types of paints – Painting of new/old wood-Varnish. Form Works and Scaffoldings.

TEXT BOOKS:

1. Building Materials by S.S. Bhavikatti, Vices publications House private ltd.
2. Building Construction by S.S. Bhavikatti, Vices publications House private ltd.
3. Building Materials by B.C. Punmia, Laxmi Publications private ltd.

REFERENCES:

1. Building Materials by S.K.Duggal, New Age International Publications.
2. Building Materials by P.C.Verghese, PHI learning (P) ltd.
3. Building Materials by M.L.Gambhir, Tata McGraw Hill Publishing Co. Ltd. New Delhi.
4. Building construction by P.C.Verghese, PHI Learning (P) Ltd.

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