

COURSE STRUCTURE AND DETAILED SYLLABUS

CIVIL ENGINEERING

For

B.TECH. DEGREE PROGRAMME
(Applicable for the batches admitted from 2022-2023)

(I & II – Year)



VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

Bollikunta, Warangal – 506 005

Telangana State, India

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

DEPARTMENT OF CIVIL ENGINEERING**B. Tech - CIVIL ENGINEERING****COURSE STRUCTURE****(R22 Regulations applicable for the batches admitted from Academic Year 2022 - 2023)****I YEAR I – SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1.	B22MA01	Matrices and Calculus	3	1	0	4
2.	B22PH01	Applied Physics	3	1	0	4
3.	B22CS06	C Programming and Data Structures	3	0	0	3
4.	B22ME01	Engineering Workshop	0	1	3	2.5
5.	B22EN01	English for Skill Enhancement	2	0	0	2
6.	B22CE01	Elements of Civil Engineering	0	0	2	1
7.	B22PH02	Applied Physics Laboratory	0	0	3	1.5
8.	B22CS07	C Programming and Data Structures Laboratory	0	0	2	1
9.	B22EN02	English Language and Communication Skills Laboratory	0	0	2	1
10.	B22CH03	Environmental Science	3	0	0	0
		Induction Programme				
Total			14	3	12	20

I YEAR II – SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1.	B22MA02	Ordinary Differential Equations and Vector Calculus	3	1	0	4
2.	B22CH01	Engineering Chemistry	3	1	0	4
3.	B22ME03	Computer Aided Engineering Graphics	1	0	4	3
4.	B22CE02	Applied Mechanics	3	0	0	3
5.	B22CE04	Surveying	2	0	0	2
6.	B22CS04	Python Programming Laboratory	0	1	2	2
7.	B22CH02	Engineering Chemistry Laboratory	0	0	2	1
8.	B22CE05	Surveying Laboratory - I	0	0	2	1
Total			12	3	10	20

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DEPARTMENT OF CIVIL ENGINEERING**B. Tech - CIVIL ENGINEERING****COURSE STRUCTURE****(R22 Regulations applicable for the batches admitted from Academic Year 2022 - 2023)****II YEAR I - SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1.	B22MA03	Probability and Statistics	3	1	0	4
2.	B22CE06	Building Materials, Construction and Planning	3	0	0	3
3.	B22CE07	Engineering Geology	3	0	0	3
4.	B22CE08	Strength of Materials – I	3	0	0	3
5.	B22CE09	Fluid Mechanics	3	0	0	3
6.	B22CE10	Surveying Laboratory - II	0	1	2	2
7.	B22CE11	Strength of Materials Laboratory	0	0	2	1
8.	B22CE12	Computer Aided Drafting Laboratory	0	0	2	1
9.	B22MC08	Logical Reasoning and Quantitative Aptitude	3	0	0	0
Total			18	2	6	20

II YEAR II - SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1.	B22EE19	Basic Electrical and Electronics Engineering	3	0	0	3
2.	B22CE13	Concrete Technology	3	0	0	3
3.	B22CE14	Strength of Materials – II	3	0	0	3
4.	B22CE15	Hydraulics and Hydraulics Machinery	3	0	0	3
5.	B22CE16	Structural Analysis - I	3	0	0	3
6.	B22CE17	Fluid Mechanics and Hydraulics Machinery Laboratory	0	0	2	1
7.	B22EE20	Basic Electrical and Electronics Engineering Laboratory	0	0	2	1
8.	B22CE18	Concrete Technology Laboratory	0	0	2	1
9.	B22CE19	Real-time Research Project/ Field-Based Project	0	0	4	2
10.	B22MC07	Gender Sensitization Laboratory	0	0	2	0
Total			15	0	12	20

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(B22MA01) MATRICES AND CALCULUS**B.Tech - I Year I – Semester**

L	T	P	C
3	1	0	4

Course Objectives: To learn

- Types of matrices and their properties.
- Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of eigen values and eigenvectors and to reduce the quadratic form to canonical form
- Geometrical approach to the mean value theorems and their application to the mathematical problems
- Evaluation of surface areas and volumes of revolutions of curves.
- Evaluation of improper integrals using Beta and Gamma functions.
- Partial differentiation, concept of total derivative
- Finding maxima and minima of function of two and three variables.
- Evaluation of multiple integrals and their applications

UNIT - I: Matrices

Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method, System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations by Gauss elimination method, Gauss Seidel Iteration Method.

UNIT - II: Eigen values and Eigen vectors

Linear Transformation and Orthogonal Transformation: Eigen values, Eigenvectors and their properties, Eigen values and Vectors with reference to Symmetric, Skew-symmetric, Hermitian, Skew- Hermitian, orthogonal and Unitary Matrices. Diagonalization of a matrix, Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem,

Quadratic Forms: Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical forms.

UNIT - III: Calculus

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem, Taylor's Series. Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates),

Beta and Gamma Functions: Introduction to Improper Integrals, Definition of Beta and Gamma functions, properties and other forms. Relation between Beta and Gamma functions. Evaluation of Improper integrals using Beta and Gamma functions

UNIT - IV: Multivariable Calculus (Partial Differentiation and applications)

Definitions of Limit and continuity. Partial Differentiation: Euler's Theorem, Total derivative, Jacobian, Functional dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration)

Evaluation of Double Integrals (Cartesian and polar coordinates), change of order of integration (only Cartesian form), Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

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

- Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
- Find the Eigen values and Eigen vectors
- Reduce the quadratic form to canonical form using orthogonal transformations.
- Solve the applications on the mean value theorems.
- Evaluate the improper integrals using Beta and Gamma functions
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas, volumes

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.

REFERENCE BOOKS:

1. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

VAAGDEVI COLLEGE OF ENGINEERING

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(B22PH01) APPLIED PHYSICS**B.Tech - I Year I – Semester**

L	T	P	C
3	1	0	4

Course Objectives: The objectives of this course for the student are to:

- Understand the basic principles of quantum physics and band theory of solids.
- Understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
- Study the fundamental concepts related to the dielectric, magnetic and energy materials.
- Identify the importance of nanoscale, quantum confinement and various fabrications techniques.
- Study the characteristics of lasers and optical fibres.

UNIT - I: QUANTUM PHYSICS AND SOLIDS

QUANTUM MECHANICS: Introduction To Quantum Physics - Blackbody Radiation – Stefan-Boltzmann's Law, Wein's And Rayleigh-Jean's Law, Planck's Radiation Law (qualitative) - Photoelectric Effect- waves and particles – de Broglie hypothesis – properties of matter waves- Davisson And Germer Experiment –Heisenberg Uncertainty Principle - Born Interpretation Of The Wave Function – Time Independent Schrodinger Wave Equation - Particle in One Dimensional Potential Box – **SOLIDS:** Free Electron Theory (Drude & Lorentz, Sommerfeld) - Fermi-Dirac Distribution - Bloch's Theorem - Kronig-Penney Model (qualitative) - E-K Diagram- Effective Mass Of electron- Origin Of Energy Bands- Classification Of Solids.

UNIT - II: SEMICONDUCTORS AND DEVICES

Intrinsic And Extrinsic Semiconductors – Hall Effect - Direct And Indirect Band Gap Semiconductors - Construction, Principle , Operation And Characteristics Of P-N Junction Diode, Zener Diode And Bipolar Junction Transistor (BJT)–LED, PIN Diode, Avalanche Photo Diode (APD) And Solar Cells, Their Structure, Materials, Working Principle And Characteristics.

UNIT - III: DIELECTRIC, MAGNETIC AND ENERGY MATERIALS

DIELECTRIC MATERIALS: Basic Definitions- Types of Polarizations (Qualitative) - Ferroelectric, Piezoelectric, and Pyroelectric Materials – Applications – Liquid Crystal Displays (LCD) And Crystal Oscillators. **MAGNETIC MATERIALS:** Hysteresis - Soft And Hard Magnetic Materials - Magnetostriction, Magnetoresistance - Applications - Bubble Memory Devices, Magnetic Field Sensors And Multi-Ferroics. **ENERGY MATERIALS:** Conductivity of Liquid and Solid Electrolytes- Superionic Conductors - Materials And electrolytes for Super Capacitors - Rechargeable Ion Batteries, Solid Fuel Cells.

UNIT - IV: NANOTECHNOLOGY

Nanoscale, Quantum Confinement, Surface to Volume Ratio, Bottom-Up Fabrication: Sol-Gel, Precipitation, Combustion Methods – Top-Down Fabrication: Ball Milling - Physical Vapor Deposition (PVD) - Chemical Vapor Deposition (CVD) - Characterization Techniques - XRD, SEM & TEM - Applications of Nano materials.

UNIT - V: LASER AND FIBER OPTICS

LASERS: Laser Beam Characteristics-Three Quantum Processes-Einstein Coefficients And Their Relations- Lasing Action - Pumping Methods- Ruby Laser, He-Ne Laser, Nd: YAG Laser-Semiconductor Laser-Applications Of Laser. **FIBER OPTICS:** Introduction To Optical Fiber-Advantages Of Optical Fibers - Total Internal Reflection construction of Optical Fiber - Acceptance Angle - Numerical Aperture- Classification Of Optical Fibers losses in Optical Fiber - Optical Fiber For Communication System - Applications.

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

- Understand physical world from fundamental point of view by the concepts of Quantum
- Mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
- Identify the role of semiconductor devices in science and engineering Applications.
- Explore the fundamental properties of dielectric, magnetic materials and energy for their applications.
- Appreciate the features and applications of Nanomaterials.
- Understand various aspects of Lasers and Optical fibre and their applications in diverse fields.

TEXT BOOKS:

1. M. N. Avadhanulu, P.G. Kshirsagar & TVS Arun Murthy' A Text book of Engineering Physics"-S. Chand Publications, 11th Edition 2019.
2. Engineering Physics by Shatendra Sharma and Jyotsna Sharma, Pearson Publication, 2019
3. Semiconductor Physics and Devices- Basic Principle – Donald A. Neamen, Mc Graw Hill, 4th Edition, 2021.
4. B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2nd Edition, 2022.
5. Essentials of Nanoscience & Nanotechnology by Narasimha Reddy Katta, Typical Creatives NANO DIGEST, 1st Edition, 2021.

REFERENCE BOOKS:

1. Quantum Physics, H.C. Verma, TBS Publication, 2nd Edition 2012.
2. Fundamentals of Physics – Halliday, Resnick and Walker, John Wiley & Sons, 11th Edition, 2018.
3. Introduction to Solid State Physics, Charles Kittel, Wiley Eastern, 2019.
4. Elementary Solid State Physics, S.L. Gupta and V. Kumar, Pragathi Prakashan, 2019.
5. A.K. Bhandhopadhyaya - Nano Materials, New Age International, 1st Edition, 2007.
6. Energy Materials a Short Introduction to Functional Materials for Energy Conversion and Storage Aliaksandr S. Bandarenka, CRC Press Taylor & Francis Group
7. Energy Materials, Taylor & Francis Group, 1st Edition

VAAGDEVI COLLEGE OF ENGINEERING

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(B22CS06) C PROGRAMMING AND DATA STRUCTURES

B.Tech. I Year I Sem.

L	T	P	C
3	0	0	3

Course Objectives:

Introduce the importance of programming, C language constructs, program development, data structures, searching and sorting.

UNIT - I

Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Software Development

Introduction to C Language – Background, Simple C programs, Identifiers, Basic data types, Variables, Constants, Input / Output

Structure of a C Program – Operators, Bit-wise operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Statements.

UNIT - II

Statements – if and switch statements, Repetition statements – while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Recursion.

Designing Structured Programs – Functions, basics, user defined functions, inter function communication, standard functions.

Arrays – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays.

UNIT - III

Pointers – Introduction, Pointers for inter function communication, pointers to pointers, compatibility,

Pointer Applications – Passing an array to a function, Memory allocation functions, array of pointers

Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion.

UNIT - IV

Derived types – The Typedef, enumerated types, Structures – Declaration, definition and initialization of structures, accessing structures, operations on structures, complex structures. Unions – Referencing unions, initializers, unions and structures.

Input and Output – Text vs Binary streams, standard library functions for files, converting file types, File programs – copy, merge files.

UNIT – V

Sorting – selection sort, bubble sort, insertion sort,

Searching – linear and binary search methods.

Data Structures – Introduction to Data Structures, abstract data types, Stack Operations using arrays, stack applications, Queue operations using arrays.

Course Outcomes:

- CO-1: Understand the various steps in Program development.
- CO-2: Explore the concepts of control statements and functions in C Programming Language.
- CO-3: Understand the concepts of pointers and its applications.
- CO-4: Ability to design and implement different types of file structures.
- CO-5: Apply data structures such as stacks, queues in problem solving and analyze various searching and sorting algorithms.

TEXT BOOKS:

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Fifth Edition, Pearson Education.
3. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI/Pearson Education

REFERENCE BOOKS:

1. C & Data structures – P. Padmanabham, 3rd Edition, B.S. Publications.
2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
3. Programming in C – Stephen G. Kochan, III Edition, Pearson Education.
4. C for Engineers and Scientists, H. Cheng, McGraw-Hill International Edition
5. Data Structures using C – A. M. Tanenbaum, Y. Langsam, and M.J. Augenstein, Pearson Education / PHI
6. C Programming & Data Structures, E. Balagurusamy, TMH.
7. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
8. C & Data structures – E V Prasad and N B Venkateswarlu, S. Chand & Co.

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)**(B22ME01) ENGINEERING WORKSHOP****B.Tech - I Year I – Semester**

L	T	P	C
0	1	3	2.5

Pre-requisites: Practical skill**Course Objectives:**

- To Study of different hand operated power tools, uses and their demonstration.
- To gain a good basic working knowledge required for the production of various engineering products.
- To provide hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
- To develop a right attitude, team working, precision and safety at work place.
- It explains the construction, function, use and application of different working tools, equipment and machines.
- To study commonly used carpentry joints.
- To have practical exposure to various welding and joining processes.
- Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.

1. TRADES FOR EXERCISES:**At least two exercises from each trade:**

- I. Carpentry – (T-Lap Joint, Dovetail Joint, Mortise & Tenon Joint)
- II. Fitting – (V-Fit, Dovetail Fit & Semi-circular fit)
- III. Tin-Smithy – (Square Tin, Rectangular Tray & Conical Funnel)
- IV. Foundry – (Preparation of Green Sand Mould using Single Piece and Split Pattern)
- V. Welding Practice – (Arc Welding & Gas Welding)
- VI. House-wiring – (Parallel & Series, Two-way Switch and Tube Light)
- VII. Black Smithy – (Round to Square, Fan Hook and S-Hook)

2. TRADES FOR DEMONSTRATION & EXPOSURE:

Plumbing, Machine Shop, Metal Cutting (Water Plasma), Power tools in construction and Wood Working.

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

CO 1: Study and practice on machine tools and their operations

CO 2: Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.

CO 3: Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.

CO 4: Apply basic electrical engineering knowledge for house wiring practice.

TEXT BOOKS:

1. Workshop Practice /B. L. Juneja / Cengage
2. Workshop Manual / K. Venugopal / Anuradha.

REFERENCE BOOKS:

1. Work shop Manual - P. Kannaiah/ K.L. Narayana/ Scitech
2. Workshop Manual / Venkat Reddy/ BSP

VAAGDEVI COLLEGE OF ENGINEERING

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(B22EN01) ENGLISH FOR SKILL ENHANCEMENT

B. Tech.. (Common to all)

L	T	P	C
2	0	0	2

Course Objectives: This course will enable the students to:

1. Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
2. Develop study skills and communication skills in various professional situations.
3. To study engineering subjects more effectively and critically using the theoretical and practical components of the syllabus.

UNIT - I

Chapter entitled ‘**Toasted English**’ by **R. K. Narayan** from “**English: Language, Context and Culture**” published by Orient Black Swan, Hyderabad.2022

Vocabulary: The Concept of Word Formation -The Use of Prefixes and Suffixes - Acquaintance with Prefixes and Suffixes from Foreign Languages to form Derivatives - Synonyms and Antonyms

Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions.

Reading: Reading and Its Importance- Techniques for Effective Reading.

Writing: Sentence Structures -Use of Phrases and Clauses in Sentences- Simple, Compound & Complex Sentences - Importance of Proper Punctuation- Techniques for Writing precisely – Paragraph Writing – Types, Structures and Features of a Paragraph - Creating Coherence- Organizing Principles of Paragraphs in Documents.

UNIT - II

Chapter entitled ‘**Appro JRD**’ by **Sudha Murthy** from “**English: Language, Context and Culture**” published by Orient BlackSwan, Hyderabad. 2022. Print.

Vocabulary: Words Often Misspelt - Homophones, Homonyms and Homographs

Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement, Collocations.

Reading: Sub-Skills of Reading – Skimming and Scanning – Exercises for Practice

Writing: Nature and Style of Writing- Defining /Describing People, Objects, Places and Events – Classifying- Providing Examples or Evidence.

UNIT - III

Chapter entitled ‘**Lessons from Online Learning**’ by **F. Haider Alvi, Deborah Hurst et al** from “**English: Language, Context and Culture**” published by Orient Black Swan, Hyderabad. 2022. Print.

Vocabulary: Words Often Confused - Words from Foreign Languages and their Use in English.

Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and tenses

Reading: Sub-Skills of Reading – Intensive Reading and Extensive Reading – Exercises for Practice.

Writing: Format of a Formal Letter-Writing Formal Letters E.g., Letter of Complaint, Letter of Requisition, Email Etiquette, Job Application with CV/Resume.

UNIT - IV

Chapter entitled ‘**Art and Literature**’ by **Abdul Kalam** from “**English: Language, Context and Culture**” published by Orient Black Swan, Hyderabad. 2022. Print.

Vocabulary: Standard Abbreviations in English, Idioms & Phrasal Verbs.

Grammar: Redundancies and Clichés in Oral and Written Communication. **Reading:** Survey, Question, Read, Recite and Review (SQ3R Method) - Exercises for Practice

Writing: Writing Practices- Essay Writing-Writing Introduction and Conclusion -Précis Writing.

UNIT - V

Chapter entitled ‘**Go, Kiss the World**’ by **Subroto Bagchi** from “**English: Language, Context and Culture**” published by Orient Black Swan, Hyderabad. 2022. Print.

Vocabulary: Technical Vocabulary and their Usage

Grammar: Common Errors in English (Covering all the other aspects of grammar which were not covered in the previous units)

Reading: Reading Comprehension-Exercises for Practice

Writing: Technical Reports- Introduction – Characteristics of a Report – Categories of Reports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

Note: Listening and Speaking Skills which are given under Unit-6 in AICTE Model Curriculum are covered in the syllabus of ELCS Lab Course.

Note: 1. As the syllabus of English given in AICTE Model Curriculum-2018 for B. Tech First Year is **Open-ended**, besides following the prescribed textbook, it is required to prepare teaching/learning materials **by the teachers collectively** in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning in the class.

Note: 2. Based on the recommendations of NEP2020, teachers are requested to be flexible to adopt Blended Learning in dealing with the course contents .They are advised to teach 40 percent of each topic from the syllabus in blended mode.

Course Outcomes: Students will be able to:

- CO1: Understand the importance of vocabulary and sentence structures.
- CO2: Choose appropriate vocabulary and sentence structures for their oral and written communication.
- CO3: Demonstrate their understanding of the rules of functional grammar.
- CO4: Develop comprehension skills using known and unknown passages.
- CO5: Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.

TEXTBOOK:

1. **English: Language, Context and Culture** by Orient Black Swan Pvt. Ltd, Hyderabad. 2022. Print.

REFERENCE BOOKS:

1. Effective Academic Writing (Second Edition) by Rhonda Liss and Jason Davis Oxford University Press
2. Richards, Jack C. (2022) Interchange Series. Introduction, 1, 2, 3. Cambridge University Press
3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
4. Chaudhuri, Santanu Sinha. (2018). Learn English: A Fun Book of Functional Language, Grammar and Vocabulary. (2nd ed.). Sage Publications India Pvt. Ltd.
5. Technical Communication. Wiley India Pvt. Ltd, (2019).
6. Vishwamohan, Aysha. (2013). English for Technical Communication for Engineering Students. Mc Graw-Hill Education India Pvt. Ltd.
7. Swan, Michael.(2016).Practical English Usage. Oxford University Press.4th Edition.

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
(B22CE01) ELEMENTS OF CIVIL ENGINEERING

B.Tech - I Year I – Semester

L	T	P	C
0	0	2	1

Pre-requisites: Nil**Course objectives:**

- To provide practical knowledge about physical properties of minerals and rocks.
- To determine the characteristics of cement, Coarse & Fine aggregates.

List of Experiments:

1. **Identification of Minerals** – Silica Group, Feldspar Group, Crystalline Group, Carbonate Group, Pyroxene Group, Mica Group, Amphibole Group.
2. **Identification of Rocks** – Igneous Petrology, Sedimentary Petrology, Metamorphic Petrology.
3. 1. Study of topographical features from Geological maps. Identification of symbols in maps.
2. Simple structural Geology Problems (Folds, Faults & Unconformities)
4. **Tests on Cement**
 - a. Fineness test & Normal Consistency test.
 - b. Specific gravity test, Initial and Final setting time of cement.
5. **Tests on Fine Aggregates**
 - a. Specific Gravity test.
 - b. Bulking of sand & Fineness modulus of Fine aggregate.
6. **Tests on Coarse Aggregate**
 - a. Specific Gravity test.
 - b. Fineness modulus of Coarse aggregate.

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

- CO1: Understands the method and ways of investigations required for Civil Engineering projects
CO2: Identify the various rocks, minerals depending on geological classifications
CO3: Evaluate the properties of cement, fine and coarse aggregates
CO4: Determine the properties and suitability of the materials for construction

REFERENCE BOOKS:

1. N. Chenna kesavulu, "Engineering Geology", Mc-Millan, India Ltd., 2nd Edition, 2018.
2. A.R. Santha Kumar, "Concrete Technology", Oxford university Press, 2nd Edition, 2018
3. IS 383 :1993 "Specification for Coarse and Fine Aggregates from Natural Sources for Concrete".

ONLINE RESOURCES:

1. <https://mg-nitk.vlabs.ac.in/mining-geology/List%20of%20experiments.html>
2. <https://cs-iitd.vlabs.ac.in/List%20of%20experiments.html>

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)**(B22PH02) APPLIED PHYSICS LABORATORY****B.Tech - I Year I – Semester**

L	T	P	C
0	0	3	1.5

Course Objectives: The objectives of this course for the student to

1. Capable of handling instruments related to the Hall effect and photoelectric effect experiments and their measurements.
2. Understand the characteristics of various devices such as PN junction diode, Zener diode, BJT, LED, solar cell, lasers and optical fibre and measurement of energy gap and resistivity of semiconductor materials.
3. Able to measure the characteristics of dielectric constant of a given material.
4. Study the behavior of B-H curve of ferromagnetic materials.
5. Able to measure the time Constant of RC Circuit.

LIST OF EXPERIMENTS:

1. Determination of work function and Planck's constant using photoelectric effect.
2. Determination of Hall co-efficient and carrier concentration of a given semiconductor.
3. Characteristics of series and parallel LCR circuits.
4. V-I characteristics of a p-n junction diode and Zener diode.
5. Input and output characteristics of BJT (CE, CB & CC configurations).
6. a) V-I and L-I characteristics of light emitting diode (LED)
b) V-I Characteristics of solar cell
7. Determination of Energy gap of a semiconductor.
8. Determination of the resistivity of semiconductor by two probe method.
9. Study B-H curve of a magnetic material.
10. Determination of dielectric constant of a given material.
11. a) Determination of the beam divergence of the given LASER beam.
b) Determination of Acceptance Angle and Numerical Aperture of an optical fiber.
12. Study of Decay Charge and Determination of Time Constant of RC Circuit

Note: Any 8 experiments are to be performed.

Course Outcomes: The students will be able to:

1. Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
2. Appreciate quantum physics in semiconductor devices and optoelectronics.
3. Gain the knowledge of applications of dielectric constant.
4. Understand the variation of magnetic field and behavior of hysteresis curve.
5. Gain the knowledge of decay of charge and determine time constant of RC circuit

REFERENCE BOOK:

1. S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics" S Chand Publishers, 2017.

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CS07) C PROGRAMMING AND DATA STRUCTURES LABORATORY**B.Tech. I Year I Sem.**

L	T	P	C
0	0	2	1

Course Objectives: Introduce the importance of programming, C language constructs, program development, data structures, searching and sorting.

List of Experiments:

1. Write a C program to find the sum of individual digits of a positive integer.
2. Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
3. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
4. Write a C program to find the roots of a quadratic equation.
5. Write a C program to find the factorial of a given integer.
6. Write a C program to find the GCD (greatest common divisor) of two given integers.
7. Write a C program to solve Towers of Hanoi problem.
8. Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement)
9. Write a C program to find both the largest and smallest number in a list of integers.
10. Write a C program that uses functions to perform the following:
 - i) Addition of Two Matrices
 - ii) Multiplication of Two Matrices
11. Write a C program that uses functions to perform the following operations:
 - i) To insert a sub-string in to a given main string from a given position.
 - ii) To delete n Characters from a given position in a given string.
12. Write a C program to determine if the given string is a palindrome or not
13. Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn't contain T.
14. Write a C program to count the lines, words and characters in a given text.
15. Write a C program to generate Pascal's triangle.
16. Write a C program to construct a pyramid of numbers.
17. Write a C program that uses functions to perform the following operations:
 - i) Reading a complex number
 - ii) Writing a complex number
 - iii) Addition of two complex numbers
 - iv) Multiplication of two complex numbers(Note: represent complex number using a structure.)

18.

- i. Write a C program which copies one file to another.
- ii. Write a C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line.)

19.

- i. Write a C program to display the contents of a file.
 - ii. Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)
20. Write C programs that implement stack (its operations) using Arrays
21. Write C programs that implement Queue (its operations) using Arrays
22. Write a C program that implements the following sorting methods to sort a given list of integers in ascending order
- i) Bubble sort
 - ii) Selection sort
 - iii) Insertion sort
23. Write C programs that use recursive functions to perform the following searching operations for a Key value in a given list of integers:
- i) Linear search
 - ii) Binary search
24. Write C programs that use non recursive functions to perform the following searching operations for a Key value in a given list of integers:
- i) Linear search
 - ii) Binary search

Course Outcomes:

- CO-1: Develop modular and readable C Programs
- CO-2: Solve problems using strings, functions. Handle data in files.
- CO-3: Implement stacks, queues using arrays.
- CO-4: To understand and analyze various searching and sorting algorithms.

TEXT BOOKS:

1. C Programming & Data Structures, B.A. Forouzan and R. F. Gilberg, Third Edition, Cengage Learning.
2. Let us C, Yeswanth Kanitkar
3. C Programming, Balaguruswamy.

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)

(B22EN02) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY

B. Tech. (Common to all)

L T P C
0 0 2 1

The **English Language and Communication Skills (ELCS) Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations both in formal and informal contexts.

Course Objectives:

- To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
- To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency of students in spoken English and neutralize the impact of dialects.
- To train students to use language appropriately for public speaking, group discussions and interviews

Syllabus:

English Language and Communication Skills Lab (ELCS) shall have two parts:

- a. **Computer Assisted Language Learning (CALL) Lab**
- b. **Interactive Communication Skills (ICS) Lab**

Listening Skills:

Objectives

1. To enable students develop their listening skills so that they may appreciate the role in the LSRWskills approach to language and improve their pronunciation
 2. To equip students with necessary training in listening, so that they can comprehend the speech of people of different backgrounds and regions
 3. Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.
- Listening for general content
 - Listening to fill up information
 - Intensive listening
 - Listening for specific information

Speaking Skills:**Objectives**

1. To involve students in speaking activities in various contexts
 2. To enable students express themselves fluently and appropriately in social and professional contexts.
- Oral practice
 - Describing objects/situations/people
 - Role play – Individual/Group activities
 - Just A Minute (JAM) Session

The following course content is prescribed for the **English Language and Communication Skills Lab**.

Exercise –I**CALL Lab:**

Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers- Effective Listening. Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants – Minimal Pairs-Consonant Clusters- Past Tense Marker and Plural Marker- Testing Exercises

ICS Lab:

Understand: Spoken vs. Written language- Formal and Informal English.

Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave –Introducing Oneself and Others.

Exercise – II CALL Lab:

Understand: Structure of Syllables – Word Stress– Weak Forms and Strong Forms – Stress pattern in sentences – Intonation.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms- Stress pattern in sentences – Intonation - Testing Exercises

ICS Lab:

Understand: Features of Good Conversation – Strategies for Effective Communication.

Practice: Situational Dialogues – Role Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise - III**CALL Lab:**

Understand: Errors in Pronunciation-Neutralising Mother Tongue Interference (MTI). Practice: Common Indian Variants in Pronunciation – Differences between British and American Pronunciation -Testing Exercises

ICS Lab:

Understand: Descriptions- Narrations- Giving Directions and Guidelines – Blog Writing Practice: Giving Instructions – Seeking Clarifications – Asking for and Giving Directions – Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise – IV

CALL Lab:

Understand: Listening for General Details.

Practice: Listening Comprehension Tests - Testing Exercises

ICS Lab:

Understand: Public Speaking – Exposure to Structured Talks - Non-verbal Communication- Presentation Skills.

Practice: Making a Short Speech – Extempore- Making a Presentation.

Exercise – V

CALL Lab:

Understand: Listening for Specific Details.

Practice: Listening Comprehension Tests -Testing Exercises

ICS Lab:

Understand: Introduction to Group Discussion, Interview Skills.

Practice: Group Discussion/Mock Interview.

Minimum Requirement of infrastructural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer Assisted Language Learning Lab has to accommodate 30 students with 30 systems, with one Master Console, LAN facility and English language learning software for self-study by students.

System Requirement (Hardware component):

Computer network with LAN facility (minimum 30 systems with multimedia) with the following specifications:

- I. Computers with Suitable Configuration
- II. High Fidelity Headphones

2. Interactive Communication Skills (ICS) Lab:

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, LCD and camcorder.

Source of Material (Master Copy):

- Exercises in Spoken English. Part 1, 2, 3. CIEFL and Oxford University Press

Note: Teachers are requested to make use of the master copy and get it tailor-made to suit the contents of the syllabus.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD.
- Grammar Made Easy by Darling Kindersley.
- Punctuation Made Easy by Darling Kindersley.
- Oxford Advanced Learner's Compass, 10th Edition.
- English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.

- English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- English Vocabulary in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).
- Digital All
- Orell Digital Language Lab (Licensed Version)

Course Outcomes: Students will be able to:

CO1: Understand the nuances of English language through audio- visual experience and group activities

CO2: Neutralize their accent for intelligibility

CO3: Develop their listening skills so that they may appreciate its role in developing LSRW skills of language and improve their pronunciation.

CO4: Involve in speaking activities in various contexts.

CO5: Speak with clarity and confidence which in turn enhance their employability skills

REFERENCE BOOKS:

1. English Language Communication Skills – Lab Manual cum Workbook. Cengage Learning India Pvt. Ltd, (2022).
2. Shobha, KN & Rayen, J. Lourdes. (2019). Communicative English – A workbook.
3. Cambridge University Press
4. Kumar, Sanjay & Lata, Pushp. (2019). Communication Skills: A Workbook. Oxford University Press
5. ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities. Orient Black Swan Pvt. Ltd, (2016).
6. Mishra, Veerendra et al. (2020). English Language Skills: A Practical Approach.
7. Cambridge University Press.
8. <https://www.wix.com//>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CH03) ENVIRONMENTAL SCIENCE

B.Tech - I Year I – Semester

L	T	P	C
3	0	0	0

Course Objectives:

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations

UNIT - I

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

UNIT - II

Natural Resources: Classification of Resources: Living and Non-Living resources, **water resources:** use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land resources:** Forest resources, **Energy resources:** growing energy needs, renewable and non-renewable energy sources, use of alternate energy source, case studies.

UNIT - III

Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In- Situ and Ex-situ conservation. National Biodiversity act.

UNIT - IV

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waste:** Municipal Solid Waste management, composition and characteristics of e-Waste and its

management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation.

Global Environmental Issues and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions /Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC-GoI Initiatives.

UNIT - V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). **Towards Sustainable Future:** Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

Course Outcomes:

- Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHILearning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS. Publications.

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22MA02) ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS**B.Tech - I Year II – Semester**

L	T	P	C
3	1	0	4

Course Objectives: To learn

- Methods of solving the differential equations of first and higher order.
- Concept, properties of Laplace transforms
- Solving ordinary differential equations using Laplace transforms techniques.
- The physical quantities involved in engineering field related to vector valued functions
- The basic properties of vector valued functions and their applications to line, surface and volume integrals

UNIT-I: First Order ODE

Exact differential equations, Equations reducible to exact differential equations, linear and Bernoulli's equations, Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling, Law of natural growth and decay.

UNIT-II: Ordinary Differential Equations of Higher Order

Second order linear differential equations with constant coefficients: non-Homogeneous terms of the type e^{ax} , $\sin ax$, $\cos ax$, polynomials in x , $e^{axy}V(x)$ and $xV(x)$ method of variation of parameters, Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation. Applications: Electrical Circuits (Both first and second order).

UNIT-III: Laplace transforms

Laplace Transforms: Laplace Transform of standard functions, First shifting theorem, Second shifting theorem, Unit step function, Dirac delta function, Laplace transforms of functions when they are multiplied and divided by 't', Laplace transforms of derivatives and integrals of function, Evaluation of integrals by Laplace transforms, Laplace transform of periodic functions, Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving differential equations with constant coefficients with give conditions by Laplace Transform method.

UNIT-IV: Vector Differentiation

Vector point functions and scalar point functions, Gradient, Divergence and Curl, Directional derivatives, Vector Identities (without proofs) Tangent plane and normal line, Scalar potential functions, Solenoidal and Irrotational vectors.

UNIT-V: Vector Integration

Line, Surface and Volume Integrals, Theorems of Green, Gauss and Stokes (without proofs) and their applications.

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

CO1: Identify whether the given differential equation of first order is exact or not

CO2: Solve higher differential equation and apply the concept of differential equation to real world problems.

CO3: Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion.

CO4: Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion.

CO5: Evaluate the line, surface and volume integrals and converting them from one to another

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.

REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CH01) ENGINEERING CHEMISTRY**B.Tech - I Year II – Semester**

L	T	P	C
3	1	0	4

Pre-requisites: Chemistry Knowledge at pre-university level**Course Objectives:**

- To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
- To include the importance of water in industrial usage, fundamental aspects of battery chemistry, significance of corrosion its control to protect the structures.
- To imbibe the basic concepts of petroleum and its products.
- To acquire required knowledge about engineering materials like cement, smart materials and Lubricants.

UNIT - I: Water and its treatment:

Introduction to hardness of water – Estimation of hardness of water by complexometric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and breakpoint chlorination. Defluoridation of water by Nalgonda technique.

Boiler troubles: Sludges, Scales and Caustic embrittlement. Internal treatment of Boiler feed water - Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods - Softening of water by ion-exchange processes. Desalination of water – Reverse osmosis.

UNIT – II Battery Chemistry & Corrosion:

Introduction - Classification of batteries- primary, secondary and reserve batteries with examples. Characteristics of batteries. Construction, working and applications of: Zn-air and Lithium ion battery, Applications of Li-ion battery to electrical vehicles. Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell and Solid oxide fuel cell. Solar cells - Introduction and applications of Solar cells.

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current methods.

UNIT - III: Polymeric materials:

Definition – Classification of polymers with examples – Types of polymerization – addition (free radical addition) and condensation polymerization with examples – Nylon 6:6, Terylene.

Plastics: Definition and characteristics- thermoplastic and thermosetting plastics, Preparation, Properties and engineering applications of PVC and Bakelite, Teflon.

Rubbers: Natural rubber and its vulcanization.

Elastomers: Characteristics –preparation – properties and applications of Buna-S, Butyl and Thiokolrubber.

Conducting polymers: Characteristics and Classification with examples-mechanism of conduction intrans-polyacetylene and applications of conducting polymers.

Biodegradable polymers: Concept and advantages - Polylactic acid and poly vinyl alcohol and their applications.

UNIT - IV: Energy Sources:

Introduction, Calorific value of fuel – HCV, LCV- Dulong's formula. Classification- solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Tropsch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG, Biodiesel – Transesterification, advantages.

UNIT - V: Engineering Materials:

Cement: Portland cement, its composition, setting and hardening.

Smart materials and their engineering applications

Shape memory materials- Poly L- Lactic acid. Thermo response materials- Polyacryl amides, Poly vinyl amides

Lubricants: Classification of lubricants with examples-characteristics of a good lubricants - mechanism of lubrication (thick film, thin film and extreme pressure)- properties of lubricants: viscosity, cloud point, pour point, flash point and fire point.

Course Outcomes:

1. Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
2. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
3. They can learn the fundamentals and general properties of polymers and other engineering materials.
4. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010
2. Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 2016
3. A text book of Engineering Chemistry by M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.
4. Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley Publications.

REFERENCE BOOKS:

1. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi (2015)
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)

(B22ME03) COMPUTER AIDED ENGINEERING GRAPHICS

B.Tech - I Year II – Semester

L	T	P	C
1	0	4	3

Course Objectives: The objectives of this course are to

- To develop the ability of visualization of different objects through technical drawings.
- To acquire computer drafting skill for communication of concepts, ideas in the design of engineering products.

UNIT - I:

Introduction to Engineering Graphics: Principles of Engineering Graphics and their Significance, Scales – Plain & Diagonal, Conic Sections – General method only. Cycloid, Epicycloid and Hypocycloid, Introduction to Computer aided drafting – views, commands and conics

UNIT- II:

Orthographic Projections: Principles of Orthographic Projections – Conventions – Projections of Points and Lines, Projections of Plane regular geometric figures. Computer aided orthographic projections – points, lines and planes

UNIT – III:

Projections of Regular Solids - Sections or Sectional views of Right Regular Solids –Prism, Cylinder, Pyramid, Cone – Computer aided projections of solids – sectional views

UNIT – IV:

Development of Surfaces of Right Regular Solids – Prism, Cylinder, Pyramid and Cone, Development of surfaces using computer aided drafting

UNIT – V:

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Conversion of Isometric Views to Orthographic Views and Vice-versa –Conventions. Conversion of orthographic projection into isometric view using computer aided drafting.

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

- CO1: Apply computer aided drafting tools to create 2D and 3D objects sketch conics and different types of solids
- CO2: Appreciate the need of Sectional views of solids and Development of surfaces of solids
- CO3: Read and interpret engineering drawings
- CO4: Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting

TEXT BOOKS:

1. Engineering Drawing N.D. Bhatt / Charotar
2. Engineering Drawing and graphics Using AutoCAD Third Edition, T. Jeyapoovan, Vikas: S.Chand and company Ltd.

REFERENCE BOOKS:

1. Engineering Drawing, Basant Agrawal and C M Agrawal, Third Edition McGraw Hill
2. Engineering Graphics and Design, WILEY, Edition 2020
3. Engineering Drawing, M. B. Shah, B.C. Rane / Pearson.
4. Engineering Drawing, N. S. Parthasarathy and Vela Murali, Oxford
5. Computer Aided Engineering Drawing – K Balaveera Reddy et al – CBS Publishers

ONLINE RESOURCES:

1. NPTEL Course on “Engineering Graphics and Design” by Prof. Naresh Varma Datla, Prof. S. R. Kale, IIT Delhi.
2. NPTEL Course on “Engineering Drawing and Computer Graphics” by Prof. Rajaram Lakkaraju, IIT Kharagpur.

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE02) APPLIED MECHANICS**B.Tech - I Year II – Semester**

L	T	P	C
3	0	0	3

Course Objectives: The objectives of this course are to

- Explain the resolution of a system of forces, compute their resultant and solve problems using equations of equilibrium
- Perform analysis of bodies lying on rough surfaces.
- Locate the centroid of a body and compute the area moment of inertia and mass moment of inertia of standard and composite sections
- Explain kinetics and kinematics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies.
- Explain the concepts of work-energy method and its applications to translation, rotation and plane motion and the concept of vibrations

UNIT - I

Introduction to Engineering Mechanics-Force Systems: Basic concepts, Particle equilibrium in 2-D & 3-D; Rigid Body equilibrium; System of Forces, Coplanar Concurrent Forces, Components in Space –Resultant-Moment of Forces and its Application; Couples and Resultant of Force System, Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems and Spatial Systems; Static Indeterminacy.

UNIT - II

Friction: Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Motion of Bodies, ladder friction

Centroid and Centre of Gravity - Centroid of Lines, Areas and Volumes from first principle, centroid of composite sections; Centre of Gravity and its implications. – Theorem of Pappus.

UNIT - III

Area moment of inertia- Definition, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections; Product of Inertia, Parallel Axis Theorem, Perpendicular Axis Theorem.

Mass Moment of Inertia: Moment of Inertia of Masses - Transfer Formula for Mass Moments of Inertia – Mass moment of inertia of composite bodies.

UNIT - IV

Kinematics of Particles: Kinematics of particles – Rectilinear motion – Curvilinear motion – Projectiles. Kinetics of Particles: Kinetics of particles – Newton's Second Law – Differential equations of rectilinear and curvilinear motion – Dynamic equilibrium – Inertia force – D. Alembert's Principle applied for rectilinear and curvilinear motion.

UNIT - V

Work - Energy Principle: Equation of translation, principle of conservation of energy, work - energy principle applied to particle motion and connected systems, fixed axis rotation. Impulse – Momentum Principle: Introduction, linear impulse momentum, principle of conservation of linear momentum, elastic impact and types of impact, loss of kinetic energy, coefficient of restitution.

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

- CO1: Understand concepts of resultant force and moment Systems.
- CO2: Analyze problems related to friction developed in motion of bodies.
- CO3: Calculate centroid and moment of inertia for simple and composite sections.
- CO4: Apply concepts of mechanics to solve problems of rigid body motion
- CO5: Understand the application of Work Energy method for plane motion problems

TEXT BOOKS:

1. Shames and Rao, Engineering Mechanics, Pearson Education, 2006
2. Reddy Vijay Kumar K. and J. Suresh Kumar (2010), Singer's Engineering Mechanics – Statics & Dynamics
3. Timoshenko S.P and Young D.H., "Engineering Mechanics", Mc Graw Hill International Edition, 1983.
4. Timoshenko S, Young D.H, Rao J. V, Sukumar Pati Engineering Mechanics, 5th Edition, McGraw Hill Education, 2017

REFERENCE BOOKS:

1. Ferdinand. L. Singer, Engineering Mechanics - Statics and Dynamics, 3rd Edition, Harper International Edition, 1994.
2. James L. Meriam, L. G. Kraige, Engineering Mechanics, John Wiley & Sons, 7th Edition, 2012.
3. Andrew Pytel, Jaan Kiusalaas, "Engineering Mechanics", Cengage Learning, 2014.
4. Beer F.P & Johnston E.R Jr. Vector, "Mechanics for Engineers", TMH, 2004.
5. Hibbeler R. C & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya, "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-II Dynamics, John Wiley & Sons, 2008.

ONLINE RESOURCES:

<https://nptel.ac.in/courses/112106286>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE04) SURVEYING**B.Tech - I Year II – Semester**

L	T	P	C
2	0	0	2

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

UNIT - I

Introduction and Basic Concepts: Introduction, Objectives, classification and principles of surveying, Scales, Shrinkage of Map, Conventional symbols and Code of Signals, Surveying accessories, phases of surveying.

Measurement of Distances and Directions

Linear distances- Approximate methods, Direct Methods- Chains- Tapes, ranging, Tape corrections, indirect methods- optical methods- E.D.M. method.

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

UNIT - II

Levelling and Contouring Leveling- Basics definitions, types of levels and levelling staves, temporary adjustments, methods of levelling, booking and Determination of levels- HI Method-Rise and Fall method, Effect of Curvature of Earth and Refraction.

Contouring- Characteristics and uses of Contours, Direct & Indirect methods of contour surveying, interpolation and sketching of Contours.

Computation of Areas and Volumes

Areas - Determination of areas consisting of irregular boundary and regular boundary (coordinates, MDM, DMD methods), Planimeter.

Volumes - Computation of areas for level section and two-level sections with and without transverse slopes, determination of volume of earth work in cutting and embankments, volume of borrow pits, capacity of reservoirs.

UNIT - III

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

Traversing: Methods of traversing, traverse computations and adjustments, Gale's traverse table, Omitted measurements.

UNIT - IV

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

Curves: Types of curves and their necessity, elements of simple curve, setting out of simple Curves,

UNIT - V

Modern Surveying Methods: Total Station and Global Positioning System: Basic principles, classifications, applications, comparison with conventional surveying. Electromagnetic wave theory - electromagnetic distance measuring system - principle of working and EDM instruments, Components

of GPS – space segment, control segment and user segment, reference systems, satellite orbits, GPS observations. Applications of GPS.

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

- CO1: Understand the working principles of survey instruments
- CO2: Identify data collection methods and prepare field notes
- CO3: Calculate angles, distances and levels and compute areas using theodolite
- CO4: Calculate the horizontal and vertical angle using Tacheometric surveying
- CO5: Understand the principles of Total station and GPS surveying.

TEXT BOOKS:

1. R. Subramanian, Surveying and levelling, Oxford university press, New Delhi, 2012.
2. Chandra AM, “Higher Surveying”, New age International Pvt. Ltd., Publishers, New Delhi, 2002.
3. Hoffman. B, H. Lichtenegga and J. Collins, Global Positioning System - Theory and Practice, Springer -Verlag Publishers, 2001.

REFERENCE BOOKS:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surveying, McGraw Hill –2000.
2. Arora K R “Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 2004.
3. B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Surveying (Vol – 1, 2 & 3), Laxmi Publications (P) ltd., New Delhi. 2012
4. Chandra A M, “Plane Surveying”, New Age International Pvt. Ltd., New Delhi, 2002.
5. Duggal S K, “Surveying (Vol – 1 & 2), Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2004.

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/105104101>
2. <https://nptel.ac.in/courses/105107158>
3. <https://nptel.ac.in/courses/105103176>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CS04) PYTHON PROGRAMMING LABORATORY**B.Tech - I Year II – Semester**

L	T	P	C
2	1	2	2

Course Objectives:

- To install and run the Python interpreter
- To learn control structures.
- To Understand Lists, Dictionaries in python
- To Handle Strings and Files in Python

Lecture- 1: Introduction to Python, Write and Execute a simple python Program, Basic Commands, Variables, Statements, Input /Output, Keywords, Standard Data Types, Strings, Operands and operators.

Lecture-2: Understanding the Decision Control Structures: The if Statement, A Word on Indentation, The if ... else Statement, The if ... elif ... else Statement.

Lecture- 3: Loop Control Statements: The while Loop, The for Loop, Infinite Loops, Nested Loops. The break Statement, The continue Statement.

Lecture- 4: Function Definition and Execution, Scoping, Arguments, Argument Calling by Keywords, Default Arguments, Function Rules, Return Values.

Lecture- 5: Lists: List, Creating List, Updating the Elements of a List, Sorting the List Elements. Storing Different Types of Data in a List, Nested Lists, Nested Lists as Matrices.

Lecture-6: Tuples: Creating and Accessing the Tuple Elements, Basic Operations on Tuples, Functions to Nested Tuples, Inserting, Modifying and Deleting Elements from a Tuple.

Lecture- 7: Exceptions : What is an Exception? Exception Handling: try..except..else.., try..finally.., Exceptions Nest, Raising Exceptions, Built-In Exceptions.

Lecture- 8: Files: Working with Files and Directories, File Processing, reading from files, writing to files, merging file contents, Controlling File I/O.

Lecture- 9: Python Classes and Objects. Inheritance in Python. Types of inheritance Python.

Lecture- 10: numpy, Plotpy and Scipy libraries of python and their functionalities. Basic GUI programming using these libraries: text labels and buttons.

Week -1: (Lecture- 1)

1.
 - i) Use a web browser to go to the Python website <http://python.org>. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
 - ii) Start the Python interpreter and type `help()` to start the online help utility.
2. Start a Python interpreter and use it as a Calculator.
3.
 - i) Write a program to calculate compound interest when principal, rate and number of periods is given.
 - ii) Given coordinates (x1, y1), (x2, y2) find the distance between two points
4. Read name, address, email and phone number of a person through keyboard and print the details.

Week - 2: (Lecture- 2 & 3)

1. Print the below triangle using for loop.
4 4
3 3 3
2 2 2 2
1 1 1 1 1
2. Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use 'if-else-if' ladder)
3. Python Program to Print the Fibonacci sequence using while loop
4. Python program to print all prime numbers in a given interval (use break)

Week - 3: (Lecture- 5)

1.
 - i) Write a program to convert a list and tuple into arrays.
 - ii) Write a program to find common values between two arrays.
2. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.
3. Write a function called palindrome that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string.

Week - 4: (Lecture- 4)

1. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
2. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.
 - i) Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
 - ii). The wordlist I provided, words.txt, doesn't contain single letter words. So, you might want to add "I", "a", and the empty string.

- iii). Write a python code to read dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.
3.
 - i) Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'
 - ii) Remove the given word in all the places in a string?
 - iii) Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the first in the word by corresponding letters in lower case without using a built-in function?
4. Writes a recursive function that generates all binary strings of n-bit length

Week - 5: (Lecture- 5)

1.
 - i) Write a python program that defines a matrix and prints
 - ii) Write a python program to perform addition of two square matrices
 - iii) Write a python program to perform multiplication of two square matrices
2. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.

Week-6: (Lecture- 10)

1.
 - a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.
 - b. Add an attribute named color to your Rectangle objects and modify draw_rectangleso that it uses the color attribute as the fill color.
 - c. Write a function called draw_point that takes a Canvas and a Point as arguments and draws a representation of the Point on the Canvas.
 - d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects. Write a function called draw_circle that draws circles on the canvas.
2. Write a Python program to demonstrate the usage of Method Resolution Order (MRO) in multiple levels of Inheritances.
3. Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week- 7: (Lecture- 7)

1. Use the structure of exception handling for all general purpose exceptions.

Week - 8: (Lecture- 8)

1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.
3. Write a Python code to Read text from a text file, find the word with most number of occurrences
4. Write a function that reads a file *file1* and displays the number of words, number of vowels, blank spaces, lower case letters and uppercase letters.

Week - 9: (Lecture- 9)

1. Import numpy, Plotpy and Scipy and explore their functionalities.
2. a) Install NumPy package with pip and explore it.
3. Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR.
4. Write a program to implement Half Adder, Full Adder, and Parallel Adder.
5. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

Course Outcomes: On successful completion of this course, students will be able to:

CO-1: Develop the application specific codes using python.

CO-2: Understand Strings, Lists, Tuples and Dictionaries in Python.

CO-3: Understand the structure of exception handling for all general purpose exceptions.

CO-4: Verify programs using modular approach, file I/O, Python standard library. Implement Digital Systems using Python.

TEXT BOOKS:

1. Supercharged Python: Take your code to the next level, Overland
2. Learning Python, Mark Lutz, O'reilly

REFERENCE BOOKS:

1. Python for Data Science, Dr. Mohd. Abdul Hameed, Wiley Publications - 1st Ed. 2021.
2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
3. Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications, Sheetal Taneja, Naveen Kumar, Pearson
4. Programming with Python, A User's Book, Michael Dawson, Cengage Learning, India Edition
5. Think Python, Allen Downey, Green Tea Press
6. Core Python Programming, W. Chun, Pearson
7. Introduction to Python, Kenneth A. Lambert, Cengage

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CH02) ENGINEERING CHEMISTRY LABORATORY**B.Tech - I Year II – Semester**

L	T	P	C
0	0	2	1

Course Objectives: The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

- Estimation of hardness and chloride content of water to check its suitability for drinking purpose.
- Students are able to perform estimations of acids and bases using conductometry, potentiometry methods.
- Students will learn to prepare polymers such as Bakelite and nylon-6,6 in the laboratory.
- Students will learn skills related to the lubricant properties such as saponification value and viscosity of oils.

List of Experiments:

I. Volumetric Analysis: Estimation of Hardness of water by EDTA Complexometry method.

II. Conductometry: Estimation of the concentration of an acid by Conductometry.

III. Potentiometry: Estimation of the amount of Fe^{+2} by Potentiometry.

IV. Determination of P^{H} : Determination of P^{H} of unknown acid solution by using Quinhydrone electrode.

V. Preparations:

1. Preparation of Bakelite.
2. Preparation Nylon - 6,6.

VI. Lubricants:

1. Estimation of acid value of given lubricant oil.
2. Estimation of Viscosity of lubricant oil using Ostwald's Viscometer.

VII. Determination of surface tension of a given liquid using Stalagmometer.

VIII. Virtual lab experiments

1. Construction of Fuel cell and it's working.
2. Smart materials for Biomedical applications
3. Batteries for electrical vehicles.
4. Functioning of solar cell and its applications.

Course Outcomes: The experiments will make the student gain skills on:

CO1: Able to determine the hardness of water

CO2: Able to perform methods such as conductometry, and potentiometry in order to find out the concentrations or equivalence points of acid, and P^H of unknown solutions.

CO3: Students are able to prepare polymers like bakelite and nylon-6,6.

CO4: Estimations saponification value, and viscosity of lubricant oils.

REFERENCE BOOKS:

1. Lab manual for Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi (2022)
2. Vogel's text book of practical organic chemistry 5th edition
3. Inorganic Quantitative analysis by A.I. Vogel, ELBS Publications.
4. College Practical Chemistry by V.K. Ahluwalia, Narosa Publications Ltd. New Delhi (2007).

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE05) SURVEYING LABORATORY – I

B.Tech - I Year II – Semester

L	T	P	C
0	0	2	1

Pre-requisites: Surveying

Course Objective:

1. Student will be able to learn and understand the various basic concept and principles used in surveying like Chain Surveying, Compass Surveying, Plane Table Surveying, and Levelling Surveying.
2. Student will be able to learn and understand various instrument used in surveying.
3. Student will learn and understand how to calculate Area of plot and Ground.
4. Student will learn and understand about Horizontal Angle, Vertical Angle, Horizontal distance and Vertical distance to study the ground profile.

List of Experiments

1. Chaining of a line using chain, measurements of area by cross staff survey.
2. Measurement of distance between two points when there is an obstacle for both chaining and ranging. Compass survey
3. Traversing by compass and adjustments in included angles and measurement of area – graphical adjustments.
4. Distance between two inaccessible points by compass. Plane Table Surveying
5. Measurement & Plotting of the area by Radiation method.
6. Determination of Positions objects by Intersection Method – Plane Table Survey.
7. Traverse by Plane table Survey.

Leveling

8. Measurement of elevation of various given points.
9. Elevation difference between two given points by reciprocal leveling.
10. Longitudinal Leveling
11. Cross – section Leveling
12. Plotting of Contours by Indirect Method

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

- CO1: Student will be able to prepare Map and Plan for required site with suitable scale.
- CO2: Student will be able to prepare contour Map and Estimate the Quantity of earthwork required for formation level for Road and Railway Alignment.
- CO3: Student will be able to judge which type of instrument to be used for carrying out survey for a Particular Area and estimate the area.
- CO4: Student will be able to judge the profile of ground by observing the available existing contour map.

REFERENCE BOOKS:

1. Dr. K.R. Arora, “Surveying Volume I and II”, Standard Book House, 15th Edition, 2015.
2. R. Subramanian, “Surveying and Leveling”, Oxford University Press, New Delhi, 2nd Edition, 2007.
3. B.C. Punmia & Ashok kumar Jain, “Surveying Volume I and II”, Laxmi Publications, 16th Edition., 2011.

ONLINE RESOURCES:

1. <http://sl-iitr.vlabs.ac.in/List%20of%20experiments.html>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22MA03) PROBABILITY AND STATISTICS**B.Tech - II Year I – Semester**

L	T	P	C
3	1	0	4

Pre-requisites: Mathematics courses of first year of study.**Course Objectives:** To learn

- The theory of Probability, and probability distributions of single and multiple random variables
- The sampling theory and testing of hypothesis and making statistical inferences

UNIT - I: Probability

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

Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions.

UNIT - II: Expectation and discrete distributions

Mean of a Random Variable, Variance and Covariance of Random Variables, Means and Variances of Linear Combinations of Random Variables, Chebyshev's Theorem.

Discrete Probability Distributions: Binomial Distribution, Poisson distribution.

UNIT - III: Continuous Distributions and sampling

Uniform Distribution, Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial Distributions.

Fundamental Sampling Distributions: Random Sampling, Some Important Statistics, Sampling Distributions, Sampling Distribution of Means and the Central Limit Theorem, t –Distribution, F-Distribution.

UNIT - IV: Estimation & Tests of Hypotheses

Introduction, Statistical Inference, Classical Methods of Estimation, Single Sample: Estimating the mean, standard error of a point estimate, prediction interval. Two sample: Estimating the difference between two means, Single sample: Estimating a proportion, Two samples: Estimating the difference between two proportions, Two samples: Estimating the ratio of two variances.

Statistical Hypotheses: General Concepts, Testing a Statistical Hypothesis, Single sample: Tests concerning a single mean, Two samples: tests on two means, One sample: test on a single proportion. Two samples: tests on two proportions, Two- sample tests concerning variances.

UNIT - V: Applied Statistics

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

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

- Apply the concepts of probability and distributions to some case studies.
- Correlate the concepts of one unit to the concepts in other units.

TEXT BOOKS:

1. Probability & Statistics for Engineers & Scientists, Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Pearson Publishers, 9th Edition, 2007.
2. Fundamentals of Mathematical statistics, S C Gupta and V K Kapoor, Khanna publications, 10th Edition, 10th Edition, 2002

REFERENCE BOOKS:

1. Fundamentals of Probability and Statistics for Engineers, T. T. Soong, John Wiley & Sons, Ltd, 2004.
2. Probability and statistics for Engineers and scientists, Sheldon M Ross, academic press. 5th edition, 2014

VAAGDEVI COLLEGE OF ENGINEERING**(Autonomous)****(B22CE06) BUILDING MATERIALS, CONSTRUCTION AND PLANNING****B.Tech - II Year I – Semester**

L	T	P	C
3	0	0	3

Pre-requisites: Nil**Course Objectives:** The objectives of the course is to

- Understand the construction materials used in daily practice
- Explain different construction techniques
- Understand the building bye-laws
- Highlight the smart building materials

UNIT - I**Stones and Bricks, Tiles:** Building stones – classifications and quarrying – properties – structural requirements – dressing.

Bricks – Composition of Brick earth – manufacture and structural requirements, Fly ash, Ceramics.

Timber, Aluminum, Glass, Paints and Plastics: Wood - structure – types and properties – seasoning– defects; alternate materials for Timber – GI / fiber– reinforced glass bricks, steel & aluminum, Plastics.**UNIT - II****Cement & Admixtures:** Ingredients of cement – manufacturing process of cement – Chemical composition – Hydration - field & lab tests.

Admixtures – mineral & chemical admixtures – uses.

UNIT - III**Building Components:** Lintels, Arches, walls, vaults – stair cases – types of floors, types of roofs – flat, curved, trussed; foundations – types; Damp Proof Course; Joinery – doors – windows – materials types.**Building Services:** Plumbing Services: Water Distribution, Sanitary – Lines & Fittings; Ventilations: Functional requirements systems of ventilations. Air-conditioning - Essentials and Types; Acoustics – characteristic – absorption – Acoustic design; Fire protection – Fire Hazards – Classification of fire- resistant materials and constructions.**UNIT - IV****Mortars, Masonry and Finishing's Mortars:** Cement Mortar, Brick masonry – types – bonds; Stone masonry – types; Composite masonry – Brick-stone composite; Concrete, Reinforced brick.**Finishers:** Plastering, Pointing, Painting, Claddings – Types – Tiles – ACP.**Form work: Types:** Requirements – Standards – Scaffolding – Design; Shoring, Underpinning.**UNIT – V****Building Planning:** Classification of buildings ,functional Planning of buildings: Sustainability and concept of Green building, General aspects to consider for planning, bye-laws and regulations, Selection of site for building construction, Principles of planning, Orientation of building and its relation to outside environment

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

- CO 1: Comprehend different types of construction material.
- CO 2: Understand the manufacturing of Cement and role of Admixtures
- CO 3: Identify the concept of building components and services
- CO 4: Know the importance of Masonry and formwork.
- CO 5: Plan a building based on the factors and principles of planning

TEXT BOOKS:

1. Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications, Revised Edition, 2014.
2. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2015.
3. Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd, 5th Edition 2005.

REFERENCE BOOKS:

1. Building Materials by Duggal, New Age International, 3rd Edition, 2008
2. Building Materials by P. C. Varghese, PHI learning Pvt. Ltd. 3rd edition, 2015
3. Construction Technology – Vol – I & II by R. Chubby, Longman UK, 2nd edition, 1987
4. Alternate Building Materials and Technology, Jagadish, Venkatarama Reddy and others; New Age Publications, revised 2013.

ONLINE REFERENCES:

1. <http://nptel.ac.in/courses/105102088/>
2. <http://nptel.ac.in/courses/105102088/#>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE07) ENGINEERING GEOLOGY**B.Tech - II Year I – Semester**

L	T	P	C
3	0	0	3

Pre-requisites: Nil**Course Objectives:** The objective of this Course is

- To give the basics knowledge of Geology that is required for constructing various Civil Engineering Structures, basic Geology, Geological Hazardous and Environmental Geology.
- To focus on the core activities of engineering geologists – site characterization and geologic hazard identification and mitigation. Planning and construction of major Civil Engineering projects.

UNIT - I

Introduction: Importance of geology from Civil Engineering point of view. Brief study of case histories of failure of some Civil Engineering constructions due to geological drawbacks. Importance of Physical geology, Petrology and Structural geology.

Weathering of Rocks: Its effect over the properties of rocks importance of weathering with reference to dams, reservoirs and tunnels weathering of common rock like “Granite”

UNIT - II

Mineralogy: Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Advantages of study of minerals by physical properties. Role of study of physical properties of minerals in the identification of minerals. Study of physical properties of following common rock forming minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of other common economics minerals such as Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite.

Petrology: Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common structures and textures of igneous. Sedimentary and metamorphic rocks. Their distinguishing features, Megascopic and microscopic and microscopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT - III

Structural Geology: Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults unconformities, and joints - their important types and case studies. Their importance Insitu and drift soils, common types of soils, their origin and occurrence in India, Stabilization of soils. Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration.

UNIT - IV

Earth Quakes: Causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Landslides, their causes and effect; measures to be taken to prevent their occurrence.

Importance of Geophysical Studies: Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric methods and geothermal method. Special importance of Electrical resistivity methods, and seismic refraction methods. Improvement of competence of sites by grouting etc. Fundamental aspects of Rock mechanics and Environmental Geology.

UNIT - V

Geology of Dams, Reservoirs, and Tunnels: Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factors contributing to the success of a reservoir. Geological factors influencing water Lightness and life of reservoirs - Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (i.e. Tithological, structural and ground water) in tunneling over break and lining in tunnels.

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

CO1: Understand the importance of geological knowledge in civil engineering point of view.

CO2: Gain basics knowledge on properties of mineralogy and petrology.

CO3: Gain knowledge about structural geology.

CO4: Understand the effects of earthquakes and importance of geophysical studies.

CO5: Understand the application of geological investigation in projects such as dams, Reservoirs and tunnels

TEXT BOOKS:

1. Engineering Geology by N. Chennakesavulu, McMillan, India Ltd. 2nd Edition, 2018.
2. Engineering Methods by D. Venkat Reddy; Vikas Publishers, Revised Edition 2015.
3. Engineering Geology by S K Duggal, H K Pandey Mc Graw Hill Education Pvt Ltd , 5th edition, 2017
4. Principles of Engineering Geology by K.V.G.K. Gokhale – B.S publications, 3rd Edition, 2006

REFERENCE BOOKS:

1. Fundamental of Engineering, F.G. Bell, B.S. Publications, 2nd Edition, 2005.
2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution, Revised Edition, 2005.
3. Engineering Geology by Subinoy Gangopadhyay, Oxford university press, 3rd Edition, 2013.
4. Engineering Geology for Civil Engineers – P.C. Varghese PHI, 5th Edition, 2011.

ONLINE REFERENCES

1. <https://nptel.ac.in/courses/105/105/105105106/>
2. <https://nptel.ac.in/courses/105/104/105104191/>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE08) STRENGTH OF MATERIALS – I**B.Tech - II Year I – Semester**

L	T	P	C
3	0	0	3

Pre-requisites: Applied Mechanics**Course Objectives:** The objective of this Course is

- To understand the nature of stresses developed in simple geometries such as bars, cantilevers and beams for various types of simple loads.
- To calculate the elastic deformation occurring in simple members for different types of loading.
- To show the plane stress transformation with a particular coordinate system for different orientation of the plane.
- To know different failure theories adopted in designing of structural members.

UNIT – I

Simple Stresses and Strains: Concept of stress and strain- St. Venant's Principle-Stress and Strain Diagram - 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

– Pure shear and Complementary shear - Elastic moduli, Elastic constants and the relationship between them – Bars of varying section – composite bars – Temperature stresses.

Strain Energy – Resilience – Gradual, sudden, and impact loadings – simple applications.

UNIT – II

Shear Force and Bending Moment: Types of beams – Concept of shear force and bending moment

– S.F and B.M diagrams for cantilever, simply supported including overhanging beams subjected to point loads, uniformly distributed load, uniformly varying load, couple and combination of these loads – Point of contraflexure – Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT – III

Flexural Stresses: Theory of simple bending – Assumptions – Derivation of bending equation- Section Modulus Determination of flexural/bending stresses of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections.

Shear Stresses: Derivation of formula for shear stress distribution – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle and channel sections.

UNIT – IV

Deflection of Beams: 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 and couple -Mohr's theorems – Moment area method – Application to simple cases.

Conjugate Beam Method: Introduction – Concept of conjugate beam method - Difference between a real beam and a conjugate beam - Deflections of determinate beams with constant and different moments of inertia.

UNIT – V

Principal Stresses: Introduction – Stresses on an oblique plane 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 –Principal stresses – Mohr's circle of stresses – ellipse of stress - Analytical and graphical solutions.

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

Course Outcome: On completion of the course, the student will be able to:

- CO1: Determine the stresses and strains in the members.
- CO2: Draw shear force and Bending moment diagram for determinate beams.
- CO3: Identify the flexural and shear stresses for various sections.
- CO4: Evaluate the slope and deflection of determinate beams.
- CO5: Identify the concept of principal stresses and theory of failures.

TEXT BOOKS:

1. Timoshenko and Gere, "Mechanics of Materials", PWS Publishing Company, Boston, 4th Edition., 1997.
2. Strength of Materials by R. K Rajput, S. Chand & Company Ltd, 5th edition, 2015
3. Mechanics of Materials by Dr. B.C Punmia, Dr. Ashok Kumar Jain and Dr. Arun Kumar Jain, 10th Edition, 2018
4. Strength of Materials by R. Subramanian, Oxford University Press, 3rd Edition, 2010

REFERENCE BOOKS:

1. Mechanics of material by R.C. Hibbeler, Prentice Hall publications, 8th edition, 2011.
2. Engineering Mechanics of Solids by Egor P. Popov, Prentice Hall publications, 2nd edition, 1998.
3. Strength of Materials by T.D.Gunneswara Rao and M.Andal, Cambridge Publishers, 5th Edition, 2018.
4. Strength of Materials by R.K. Bansal, Lakshmi Publications House Pvt. Ltd. Revised 4th Edition, 2010.

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/112/101/112101095/>
2. <https://nptel.ac.in/courses/105/105/105105108/>

VAAGDEVI COLLEGE OF ENGINEERING**(Autonomous)****(B22CE09) FLUID MECHANICS****B.Tech - II Year I – Semester**

L	T	P	C
3	0	0	3

Pre-requisites: Nil**Course Objectives:** The objectives of the course are to

- Introduce the concepts of fluid mechanics useful in Civil Engineering applications.
- Provide a first level exposure to the students to fluid statics, kinematics and dynamics.
- Train and analyses engineering problems involving fluids with a mechanistic perspective is essential for the civil engineering students
- To obtain the velocity and pressure variations in various types of simple flows.

UNIT – I**Properties of Fluid**

Distinction between a fluid and a solid; Properties of fluids – Viscosity, Newton law of viscosity; vapour pressure, boiling point, cavitation; surface tension, capillarity, Bulk modulus of elasticity, compressibility.

Fluid Statics

Fluid Pressure: Pressure at a point, Pascals law, Hydrostatic law, Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micromanometers. Pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces.

UNIT - II**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; Streamline, path line, streak line and stream tube; stream function, velocity potential function, flow net, One, two- and three-dimensional continuity equations in Cartesian coordinates applications.

Fluid Dynamics

Surface and Body forces -Euler's and Bernoulli's equation; Momentum equation. correction factors. Bernoulli's equation to real fluid flows.

UNIT - III**Flow Measurement in Pipes**

Practical applications of Bernoulli's equation: venturi meter, orifice meter and pitot tube, applications of Momentum equations; Forces exerted by fluid flow on pipe bend, sudden enlargement in pipes.

Flow Over Notches & Weirs

Flow through rectangular; triangular and trapezoidal notches and weirs; End contractions; Velocity of approach. Broad crested weir.

UNIT – IV**Flow through Pipes**

Reynolds experiment, Reynolds number, Loss of head through pipes, Darcy-Wiesbatch equation, minor losses, total energy line, hydraulic grade line, Pipes in series, equivalent pipes, pipes in parallel, siphon, branching of pipes, three reservoir problem, power transmission through pipes. Analysis of pipe networks: Hardy Cross method and EPA NET, water hammer in pipes and control measures.

UNIT - V**Laminar & Turbulent Flow**

Laminar flow through circular pipes, and fixed parallel plates.

Boundary Layer Concepts

Prandtl contribution, Assumption and concept of boundary layer theory. Boundary-layer thickness, displacement, momentum & energy thickness concepts of laminar and turbulent boundary layers on a flat plate; Laminar sub-layer, smooth and rough boundaries. Local and average friction coefficients. Separation and Control. Drag and Lift and types of drag, magnus effect.

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

- CO 1: Understand the broad principles of fluid statics,
- CO 2: Learn the concept of fluid kinematics and dynamics.
- CO 3: Understand the measurement of flow in pipes and notches.
- CO 4: Understand classifications of flow losses through pipes.
- CO 5: Apply the continuity, momentum and energy principles.

TEXT BOOKS:

1. Fluid Mechanics by Modi and Seth, Standard Book House, 22nd Edition, 2019
2. Fluid Mechanics and Hydraulic machines by Manish Kumar Goyal, PHI learning Private Limited, Revised Edition, 2015.
3. Fluid Mechanics by R.C. Hibbeler, Pearson India Education Services Pvt. Ltd, 2nd edition, 2011.

REFERENCE BOOKS:

1. Fluid Mechanics – Frank M. White – 8th Edition – Mc Graw Hill Education, 7th Edition, 2011.
2. Theory and Applications of Fluid Mechanics, K.Subramanya, Tata McGraw Hill, 1993.
3. Introduction to Fluid Mechanics and Fluid Machines by SK Som, Gautam Biswas, Suman Chakraborty, Mc Graw Hill Education (India) Private Limited, 3rd edition, 2011.
4. Fluid Mechanics and Machinery, C.S.P. Ojha, R. Berndtsson and P. N. Chadramouli, Oxford University Press, 2010.

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/112/104/112104118/>
2. <https://nptel.ac.in/courses/112/105/112105171/>

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
(B22CE10) SURVEYING LABORATORY – II

B.Tech - II Year I – Semester

L	T	P	C
0	1	2	2

Pre-requisites: Surveying**Course Objectives:**

- Student will be able to learn and understand about theodolite and total station in surveying.
- Student will learn and understand how to calculate Area of plot and ground.
- Student will learn and understand about Horizontal Angle, Vertical Angle, Horizontal distance and Vertical distance to study the ground profile using total station.

LIST OF EXPERIMENTS:**Theodolite surveying:**

1. Measurement of horizontal angles and vertical angles.
2. Distance between two inaccessible points.
3. Measurement of area by theodolite traversing.
4. Determination of tachometer constants.
5. Distance between two inaccessible points using the principles of trigonometric surveying

Total Station:

6. Area Measurement
7. Stake Out
8. Remote Elevation Measurement
9. Missing Line Measurement
10. Contouring
11. Providing a Simple Circular Curve

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

- CO 1: Calculate area of given plot/points using theodolite survey.
CO 2: Determine the angle/distance of given points using theodolite survey.
CO 3: Find out the area, distance and elevation of the given points using total station
CO 4: Determine the height and plot curve using Total station

REFERENCE BOOKS:

1. Dr. K.R. Arora, “Surveying Volume I and II”, Standard Book House, 15th Edition, 2015.
2. R. Subramanian, “Surveying and Leveling”, Oxford University Press, New Delhi, 2nd Edition, 2007.
3. B.C. Punmia & Ashok kumar Jain, “Surveying Volume I and II”, Laxmi Publications, 16th Edition., 2011.

ONLINE RESOURCES:

1. <http://sl-iitr.vlabs.ac.in/List%20of%20experiments.html>

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
(B22CE11) STRENGTH OF MATERIALS LABORATORY

B.Tech - II Year I – Semester

L	T	P	C
0	0	2	1

Pre-requisites: Nil**Course Objectives:**

- To conduct the Tension test, Compression test on various materials
- To conduct the Shear test, Bending test on determinate beams
- To conduct the Compression test on spring and Hardness test using various machines
- To conduct the Torsion test, Impact test on various materials

List of Experiments:

1. Tension test
2. Bending test on Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on concrete.
8. Impact test
9. Shear test
10. Continuous beam – deflection test

Course Outcomes: After the completion of the course, students will be able to

- CO1: Identify the bending behavior of beams using bending test.
CO2: Determine the behavior of material under torsion.
CO3: Determine the hardness of materials using different tests.
CO4: Find out the characteristic of material under compression, impact and shear test.

REFERENCE BOOKS:

1. Rajput.R.K. “Strength of Materials”, S.Chand and Co, New Delhi, 4th Edition, 2018
2. Punmia.B.C., Ashok Kumar Jain and Arun Kumar Jain, SMTS – I Strength of materials, Laxmi Publications, New Delhi, 10th Edition, 2018
3. Bansal. R.K. “Strength of Materials”, Laxmi Publications Pvt. Ltd., New Delhi, 6th Edition, 2018

ONLINE RESOURCES:

1. <http://sm-nitk.vlabs.ac.in/List%20of%20experiments.html>
2. <https://eerc01-iiith.vlabs.ac.in/List%20of%20experiments.html>

VAAGDEVI COLLEGE OF ENGINEERING**(Autonomous)****(B22CE12) COMPUTER AIDED DRAFTING LABORATORY****B.Tech - II Year I – Semester**

L	T	P	C
0	0	2	1

Pre-requisites: Nil**Course Objectives:**

- To be able to plan buildings as per NBC.
- To understand various types of conventional signs and brick bonds.
- To draw the plan section and elevation for doors, trusses and staircases.
- To use AutoCAD tools to draw building plans, sections and elevations from a given line diagram and specifications.

List of Experiments:

1. Planning Aspects of Building systems as per National Building Code (NBC).
2. Brick bonds: English bond & Flemish bond – Odd and Even courses.
3. Developing plan and section of dog-legged staircase.
4. Developing plan of single storied residential building.
5. Developing section and elevation of single storied residential building.
6. Developing plan of single /two storied Residential building as per Building by-laws.
7. Developing plan of public building as per building by-laws.
8. Developing section and elevation of public building.
9. Development of working drawing of building –Electrical Layout.
10. Development of working drawing of building – Plumbing Layout.

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

CO 1: Plan buildings as per NBC.

CO 2: Draw brick bonds, Plan, Section and Elevation of buildings.

CO 3: Develop residential building and public building as per the building by-laws.

CO 4: Draw Electrical layout, Plumbing layout for buildings.

REFERENCE BOOKS:

1. Engineering Graphics by P. J. Sha - S. Chand & Co
2. Civil Engineering Drawing-I by S. Mahaboob Basha – Falcon Publishers
3. Building drawing by M. G. Shah - Tata McGraw-Hill Education
4. Structural Engineering Drawing by S. Mahaboob Basha – Falcon Publishers

ONLINE RESOURCES:

1. <https://www.autodesk.in/campaigns/autocad-tutorials>

VAAGDEVI COLLEGE OF ENGINEERING**(Autonomous)****(B22MC08) LOGICAL REASONING AND QUANTITATIVE APTITUDE****B.Tech - II Year I – Semester**

L	T	P	C
3	0	0	0

Pre-requisites: Mathematics**Objectives:**

The purpose of this course ensure the students

- To improve logical thinking with general applications using mathematical concepts like sequences, series, number theory and probability.
- It also features students to analyze data interpretation and able to improve their mathematical skills in various general aspects like coding and decoding, Time and Work puzzles solving blood relations etc.

Unit – I: Logical Reasoning

1. Coding and Decoding
2. Distance and Directions
3. Classifications
4. Odd man out and series
5. Clocks and Calendars etc.

Unit – II: Logical ability

1. Blood relations
2. Seating Arrangements
3. Figure Analysis
4. Puzzles etc.

Unit – III: Number systems

1. LCM and HCF
2. Ratio and proportion
3. Simple interest and compound interest
4. Profit and Loss etc.

Unit – IV: Arithmetic ability

1. Time and work
2. Partnerships
3. Time speed and distance
4. Problems on Trains etc.

Unit – V: Mathematical ability

1. Sequence and series
2. Permutations and combination
3. General probability etc.

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22EE19) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**B.Tech - II Year II – Semester**

L	T	P	C
3	0	0	3

Pre-requisites:**Course Objectives:**

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

UNIT - I:

D.C. Circuits: Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation.

A.C. Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits, Three- phase balanced circuits, voltage and current relations in star and delta connections.

UNIT - II:

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

UNIT - III:

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

UNIT - IV:

P-N Junction and Zener Diode: Principle of Operation Diode equation, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Zener diode characteristics and applications.

Rectifiers and Filters: P-N junction as a rectifier - Half Wave Rectifier, Ripple Factor - Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters – Inductor Filters, Capacitor Filters, L- section Filters, π - section Filters.

UNIT - V:

Bipolar Junction Transistor (BJT): Construction, Principle of Operation, Amplifying Action, Common Emitter, Common Base and Common Collector configurations, Comparison of CE, CB and CC configurations.

Field Effect Transistor (FET): Construction, Principle of Operation, Comparison of BJT and FET, Biasing FET.

Course Outcomes:

- CO 1: To analyze and solve electrical circuits using network laws and theorems.
- CO 2: To understand and analyze basic Electric and Magnetic circuits
- CO 3: To study the working principles of Electrical Machines
- CO 4: To introduce components of Low Voltage Electrical Installations
- CO 5: To identify and characterize diodes and various types of transistors.

TEXT BOOKS:

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

REFERENCE BOOKS:

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

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE13) CONCRETE TECHNOLOGY

B.Tech - II Year II – Semester

L	T	P	C
3	0	0	3

Pre-requisites: Building Materials

Course Objectives: The objectives of the course are to

- Know different types of cement as per their properties for different field applications.
- Understand Design economic concrete mix proportion for different exposure conditions and intended purposes.
- Know field and laboratory tests on concrete in plastic and hardened stage.

UNIT I

Aggregate: Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine, Manufactured sand and coarse Aggregates – Gap graded aggregate – Maximum aggregate size- Properties Recycled aggregate.

UNIT - II

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, vibration and revibration of concrete – Steps in manufacture of concrete – Quality of mixing water.

UNIT – III

Hardened Concrete: Water / Cement ratio – Abram’s Law – Gel/space ratio – Gain of strength of concrete – Maturity concept – Strength in tension and compression – Factors affecting strength – Relation between compression and tensile strength - Curing.

Testing of Hardened Concrete: Compression tests– Tension tests – Factors affecting strength – Flexure tests – Splitting tests – Pull-out 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

Admixtures: Types of admixtures – mineral and chemical admixtures.

Mix Design: Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Proportioning of concrete mixes by various methods – BIS method of mix design.

Special Concretes: Introduction to Light weight concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Polymer concrete – High performance concrete – Self compacting concrete, Nano silica and Nano Alumina concrete.

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

CO1: Acquire knowledge on the testing of aggregates and its properties.

CO2 : Understand the properties of concrete in fresh state.

CO3 : Comprehend the properties of concrete in hardened concrete.

CO3 : Ability to know the concept of Elasticity, Creep and Shrinkage.

CO5 : Identify different types of admixtures and special concrete

TEXT BOOKS:

1. Concrete Technology by M.S. Shetty , S. Chand & Co., 8th Edition, 2019.
2. Properties of Concrete by A. M. Neville – Pearson Education Limited, 5th Edition, 2012
3. Concrete Technology by M. L. Gambhir. – Tata Mc. Graw Hill Publishers, 5th Edition, 2009

REFERENCE BOOKS:

1. Concrete: Micro structure, Properties and Materials – P.K. Mehta and J.M. Monteiro, Mc- Graw Hill Publishers, 4th Edition 2017.
2. Concrete Technology, A.M.Neville & J.J.Brooks, Pearson Education Limited, 2nd Edition, 2019
3. Concrete Technology by A.R. Santhakumar, Oxford university Press, New Delhi 2nd Edition, 2018

CODE BOOKS:

1. IS 4031:1988 - Methods of Physical tests for Hydraulic Cement, BIS Publication
2. IS 10262-2019 - Guidelines for concrete mix design proportioning, BIS Publication
3. IS 383 : 2016 –Coarse and Fine aggregate for concrete, BIS Publication
4. IS 516:2018 (Part 1-4) – Hardened Concrete – Method of Test, BIS Publication
5. IS 2386:1963 – Methods of Test for aggregate for concrete, BIS Publication
6. SP 23:1982 – Handbook on concrete mixes, BIS Publication

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/105/102/105102012/>
2. <https://nptel.ac.in/courses/105/104/105104030/>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE14) STRENGTH OF MATERIALS – II**B.Tech - II Year II – Semester**

L	T	P	C
3	0	0	3

Pre-requisites: Strength of Materials - I**Course Objectives:** The objective of this course is

- To understand the nature of stresses developed in simple geometries shafts, springs, columns & cylindrical and spherical shells for various types of simple loads.
- To calculate the stability and elastic deformation occurring in various simple geometries for different types of loading.
- To understand the unsymmetrical bending and shear center importance for equilibrium conditions in a structural member of having different axis of symmetry.

UNIT – I

Torsion of Circular Shafts: Theory of pure torsion – Derivation of Torsion equation -Assumptions made in the theory of pure torsion – Polar section modulus – Power transmitted by shafts – Combined bending and torsion – Design of shafts according to theories of failure.

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

UNIT – II

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– Long columns subjected to eccentric loading – Secant formula – Empirical formulae — Rankine – Gordon formula- Straight line formula – Prof. Perry's formula.

BEAM COLUMNS: Laterally loaded struts – subjected to uniformly distributed and concentrated loads.

UNIT - III

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 retaining walls, chimneys and dams – conditions for stability-Overturning and sliding – stresses due to direct loading and bending moment about both axis.

UNIT – IV

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

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

UNIT – V

Unsymmetrical Bending:

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

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

Course Outcomes: After the completion of this course, the students will be able to

CO1: Understand the concept of torsion of circular shafts and springs

CO2: Determine the critical load of columns

CO3: Evaluate the direct and bending stresses of different structures

CO4: Determine the stresses developed in thick and thin cylinders

CO5: Analyze the unsymmetrical bending of beams and shear centre for different section

TEXT BOOKS:

1. Timoshenko and Gere, “Mechanics of Materials”, PWS Publishing Company, Boston, 4th Edition., 1997.
2. Rattan.S.S., "Strength of Materials", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2nd Edition, 2011.
3. Punmia B.C., Ashok Kumar Jain and Arun Kumar Jain, "Theory of Structures (SMTS) – II” , Laxmi Publishing Pvt Ltd, New Delhi, 12th Edition, 2017.

REFERENCE BOOKS:

1. Andrew Pytel and Ferdinand L. Singer, “Strength of Materials”, Harper and Row Publishers, New York, 4th Edition., 2011.
2. Ferdinand P Beer et al., “Mechanics of Materials”, Tata McGraw Hill Education Pvt. Ltd, 6th Edition, 2012.
3. Rajput R.K. "Strength of Materials (Mechanics of Solids)", S.Chand & company Ltd., New Delhi, 5th Edition, 2015.

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/112/101/112101095/>
2. <https://nptel.ac.in/courses/105/105/105105108/>

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
(B22CE15) HYDRAULICS AND HYDRAULIC MACHINERY

B.Tech - II Year II – Semester

L	T	P	C
3	0	0	3

Pre-requisites: Fluid Mechanics**Course Objectives:** The objective of the course is

- To Define the fundamental principles of water conveyance in open channels.
- To Discuss and analyze the open channels in uniform and Non-uniform flow conditions.
- To Study the characteristics of hydroelectric power plant and its components.
- To analyze and design of hydraulic machinery and its modeling.

UNIT - I

Open Channel Flow – I: Introduction to Open channel flow-Comparison between open channel flow and pipe flow, Classification of open channel flows, Velocity distribution. Uniform flow – Characteristics of uniform flow, Chezy's, Manning's and Bazin formulae for uniform flow – Factors affecting Manning's Roughness Coefficient. Most economical sections. Computation of Uniform flow, Normal depth.

Critical Flow: Specific energy – critical depth - computation of critical depth – critical, sub critical and super critical flows-Channel transitions.

UNIT - II

Open Channel Flow – II: Non-uniform flow – Gradually Varied Flow - Dynamic equation for G.V.F; Classification of channel bottom slopes – Classification and characteristics of Surface profiles – Computation of water surface profiles by Numerical and Analytical approaches. Direct step method. **Rapidly varied flow:** Elements and characteristics (Length and Height) of Hydraulic jump in rectangular channel– Types, applications and location of hydraulic jump, Energy dissipation and other uses – Positive and Negative Surges (Theory only).

UNIT - III

Dimensional Analysis and Hydraulic Similitude: Dimensional homogeneity – Rayleigh's method and Buckingham's π methods – Dimensionless groups. Similitude, Model studies, Types of models. Application of dimensional analysis and model studies to fluid flow problems. Distorted models.

Basics of Turbo Machinery: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, Jet striking centrally and at tip, Velocity triangles at inlet and outlet, expressions for work done and efficiency – Angular.

UNIT - IV

Hydraulic Turbines – I: Elements of a typical Hydropower installation – Heads and efficiencies – Classification of turbines – Pelton wheel – Francis turbine – Kaplan turbine – working, working proportions, velocity diagram, work done and efficiency, hydraulic design. Draft tube – Classification, functions and efficiency.

Hydraulic Turbines – II: Governing of turbines – Surge tanks – Unit and specific turbines – Unit speed– Unit quantity – Unit power – Specific speed – Performance characteristics – Geometric similarity – Cavitation. Selection of turbines.

UNIT - V

Centrifugal Pumps: Pump installation details – classification – work done – Manometric head – minimum starting speed – losses and efficiencies – specific speed. Multistage pumps – pumps in parallel – performance of pumps – characteristic curves – NPSH – Cavitation.
Reciprocating pumps – Working, discharge, slip indicator diagrams.

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

CO 1: Apply fundamental knowledge in open-channel hydraulics in Civil Engineering.

CO 2: Describe dimensional analysis and similarity to develop hydraulic model.

CO 3: Understand about the turbo-machines and its efficiency

CO 4: Gain knowledge of hydraulic turbines and their operational design.

CO 5: Evaluate the performance of centrifugal pumps.

TEXT BOOKS:

1. Fluid Mechanics , Modi and Seth, Standard Book House, 22nd Edition, 2019
2. Fluid Mechanics and Hydraulic machines, Manish Kumar Goyal, PHI learning Private Limited, Revised Edition, 2015
3. Open Channel flow, K. Subramanya, Tata McGraw-Hill Publishers, 3rd Editrion, 2009.

REFERENCE BOOKS:

1. Fluid Mechanics by R. C. Hibbeler, Pearson India Education Services Pvt. Ltd, 2nd edition, 2011.
2. Fluid Mechanic & Fluid Power Engineering by D. S. Kumar (Kataria & Sons Publications Pvt. Ltd.), 9th edition, 2015, reprint 2018.
3. Introduction to Fluid Mechanics and Fluid Machines by SK Som, Gautam Biswas, Suman Chakraborty, Mc Graw Hill Education (India) Private Limited, 3rd edition, 2011.
4. Hydraulic Machines by Banga& Sharma (Khanna Publishers), 7th edition, 1998

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/105/103/105103096/>
2. <https://nptel.ac.in/courses/112/104/112104117/>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE16) STRUCTURAL ANALYSIS – I**B.Tech - II Year II – Semester**

L	T	P	C
3	0	0	3

Pre-requisites: Strength of Materials - I**Course Objectives:** The objective of the course is to

- Differentiate the statically determinate and indeterminate structures.
- To understand the nature of stresses developed in perfect frames and three hinged arches for various types of simple loads
- Analyse the statically indeterminate members such as fixed bars, continuous beams and for various types of loading.
- Understand the energy methods used to derive the equations to solve engineering problems
- Evaluate the Influence on a beam for different static & moving loading positions

UNIT – I

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

UNIT – II

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

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

UNIT - III

Propped Cantilever and Fixed Beams: Determination of static and kinematic indeterminacies for beams- Analysis of Propped cantilever and fixed beams, including the beams with different moments of inertia - subjected to uniformly distributed load - point loads - uniformly varying load, couple and combination of loads - Shear force, Bending moment diagrams and elastic curve for Propped Cantilever and Fixed Beams-Deflection of Propped cantilever and fixed beams - effect of sinking of support, effect of rotation of a support.

UNIT – IV

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.

Slope Deflection Method: Derivation of slope-deflection equation, application to continuous beams with and without sinking of supports -Determination of static and kinematic indeterminacies for frames - Analysis of Single Bay, Single storey Portal Frames by Slope Deflection Method including Side Sway - Shear force and bending moment diagrams and Elastic curve.

UNIT – V

Moving Loads and Influence Lines: Introduction maximum SF and BM at a given section and absolute maximum shear force and bending moment due to single concentrated load ,uniformly distributed load longer than the span, uniformly distributed load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length - Definition of influence line for shear force and bending moment - load position for maximum shear force and maximum bending Moment at a section - Point loads, uniformly distributed load longer than the span, uniformly distributed load shorter than the span.

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

- CO 1: Analyze pin-jointed plane frames by different methods.
- CO 2: Analyze three hinged arches and understand the concept of energy theorems.
- CO 3: Understand the Indeterminate beams with rotation of a support.
- CO 4: Analyze the beams using three moments and slope deflection method.
- CO 5: Understand the concept of moving loads and influence lines.

TEXT BOOKS:

1. Structural Analysis Vol –I & II by V.N. Vazirani and M.M. Ratwani, Khanna Publishers, 16th edition, 2015.
2. Structural Analysis Vol I & II by G. S. Pandit and S.P. Gupta, Tata McGraw Hill Education Pvt. Ltd, Revised Edditin, 2011
3. Mechanics of Structures Vol – I and II by H.J. Shah and S.B. Junnarkar, Charotar Publishing House Pvt. Ltd, 3rd Edition.2014

REFERENCE BOOKS:

1. Structural Analysis by R. C. Hibbeler, Pearson Education, 8th edition, 2009
2. Basic Structural Analysis by K.U. Muthu, I.K. International Publishing House Pvt. Ltd, Revised Edition, 2009
3. Structural analysis T. S Thandavamoorthy, Oxford university Press, Revised Edition, 2011
4. Basic Structural Analysis by C. S. Reddy, Tata McGraw Hill Education Pvt. Ltd, 3rd edition, 2010

ONLINE REFERENCES:

1. <https://nptel.ac.in/courses/105/105/105105166/>
2. <https://nptel.ac.in/courses/105/101/105101085/>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE17) FLUID MECHANICS AND HYDRAULICS MACHINERY LABORATORY**B.Tech - II Year II – Semester**

L	T	P	C
0	0	2	1

Pre-requisites: Nil**Course Objectives**

- To identify the behavior of analytical models introduced in lecture to the actual behavior of real fluid flows.
- To explain the standard measurement techniques of fluid mechanics and their applications.
- To illustrate the students with the components and working principles of the Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- To analyze the laboratory measurements and to document the results in an appropriate format.

List of Experiments

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

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

CO 1: Describe the basic measurement techniques of fluid mechanics and its application.

CO 2: Demonstrate practical understanding of the minor and friction losses in pipe flows

CO 3: Discover practical working of Hydraulic machines- different types of Turbines, Pumps and other miscellaneous hydraulics machines.

CO 4: Compare results of analytical models with actual behavior of real fluid flows.

REFERENCE BOOKS:

1. D.S. Kumar, "Fluid Mechanics & Fluid Power Engineering", Kataria & Sons, 9th Edition, 2018
2. K. Subramanya, "Fluid Mechanics and Hydraulic Machines", Tata McGraw Hill Education Pvt. Ltd, 2nd Edition, 2019
3. Rajput.R.K. "Fluid Mechanics and Hydraulic Machines", S.Chand and Co, New Delhi, 6th Edition, 2016

ONLINE RESOURCES:

1. <http://fm-nitk.vlabs.ac.in/List%20of%20experiments.html>
2. <https://eerc03-iiith.vlabs.ac.in/List%20of%20experiments.html>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

**(B22EE20) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
LABORATORY****B.Tech - II Year II – Semester**

L	T	P	C
0	0	2	1

Pre-requisites: Basic Electrical and Electronics Engineering**Course Objectives:**

- To introduce the concepts of electrical circuits and its components
- To understand magnetic circuits, DC circuits and AC single phase & three phase circuits
- To study and understand the different types of DC/AC machines and Transformers.
- To introduce the concepts of diodes & transistors
-

List of experiments/demonstrations:

1. Verification of KVL and KCL
2. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer.
3. Magnetization Characteristics of a Separately Excited DC Shunt Generator
4. Swinburn's test on dc shunt machine
5. Performance Characteristics of a Three-phase Induction Motor.
6. Study and operation of
 - (i) Multi-meters (ii) Function Generator (iii) Regulated Power Supplies (iv) CRO.
7. PN Junction diode characteristics
8. Zener diode characteristics and Zener as voltage Regulator
9. Input & Output characteristics of Transistor in CB / CE configuration
10. Full Wave Rectifier with & without filters

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

- CO 1: To analyze and solve electrical circuits using network laws
 CO 2: To understand and analyze basic Electric and Magnetic circuits
 CO 3: To study the working principles of Electrical Machines
 CO 4: To identify and characterize diodes and various types of transistors.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Electronic Devices and Circuits – R. L. Boylestead and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
2. Millman's Electronic Devices and Circuits – J. Millman and C. C. Halkias, Satyabrata Jit, TMH, 2/e, 1998.
3. Engineering circuit analysis- by William Hayt and Jack E. Kemmerly, McGraw Hill Company, 6th edition.
4. Network Theory by N. C. Jagan& C. Lakshminarayana, B.S. Publications.
5. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.
6. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
(B22CE18) CONCRETE TECHNOLOGY LABORATORY

B.Tech - II Year II – Semester

L	T	P	C
0	0	2	1

Pre-requisites: Nil

Course Objectives:

1. To know the various procedures to determine the characteristics of cement
2. To understand the test procedures to evaluate the characteristics of aggregates
3. To know the test procedures to find the properties of fresh concrete
4. To understand the test procedures to find mechanical properties of hardened concrete

List of Experiments

1. Tests on Cement:

- a) Soundness.
- b) Compressive strength.

2. Tests on Aggregates:

- a) Water Absorption
- b) Impact Test
- c) Crushing Test

3. IS method of mix design of normal concrete as per IS: 10262

4. Tests on Fresh Concrete:

- a) Slump cone test.
- b) Compacting factor test.
- c) Vee-Bee consistometer test.

5. Tests on Hardened Concrete:

- a) Compressive & Split Tensile strength tests.
- b) Flexural Strength Test
- c) Modulus of elasticity of concrete.
- d) Non-destructive testing of concrete – Rebound and Ultrasonic Pulse Velocity Test

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

CO1: Acquire knowledge on the properties of cement and aggregate

CO2: Evaluate the workability of fresh Concrete

CO3: Determine the strength characteristics of hardened concrete

CO4: Gain knowledge of Non-destructive test on concrete

REFERENCE BOOKS

1. A.M.Neville, “Properties of Concrete”– Pearson Education Limited, 5th Edition, 2012
2. M.S.Shetty, “Concrete Technology”, S.Chand & Co., 8th Edition, 2019
3. A.R. Santha Kumar, “Concrete Technology”, Oxford university Press, 2nd Edition, 2018

IS CODES:

1. IS: 4031 (Part-3) - Methods of Physical tests for Hydraulic Cement.
2. IS: 4031 (Part-6) - Methods of Physical tests for Hydraulic Cement.
3. IS: 383 - Specifications for Coarse and Fine aggregate from Natural Sources for Concrete.
4. IS: 2386 - Methods of Tests for Aggregates for Concrete.
5. IS: 1199 - Methods of Sampling and Analyses of Concrete.
6. IS: 516 - Methods of Tests for Strength of Concrete.
7. IS 13311 – (Part-1 & 2) Non Destructive testing of Concrete – Methods of tests.
8. IS: 456 – Plain and Reinforced Concrete – Code of Practice.
9. IS: 10262 – Concrete mix Proportioning - Guidelines

ONLINE RESOURCES

1. <https://cs-iitd.vlabs.ac.in/List%20of%20experiments.html>

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

(B22CE19) REAL - TIME RESEARCH PROJECT/FIELD - BASED PROJECT

B.Tech - II Year II – Semester

L	T	P	C
0	0	4	2

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
(B22MC07) GENDER SENSITIZATION LABORATORY

B.Tech - II Year II – Semester

L	T	P	C
0	0	2	0

COURSE DESCRIPTION

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

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

Course Objectives:

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

UNIT - I: UNDERSTANDING GENDER

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

UNIT – II: GENDER ROLES AND RELATIONS

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

UNIT – III: GENDER AND LABOUR

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

UNIT – IV: GENDER - BASED VIOLENCE

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

Domestic Violence: Speaking Out Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-“I Fought for my Life....”

UNIT – V: GENDER AND CULTURE

Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks-The Brave Heart.

Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

□ Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments. Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on “Gender”.

□ **ESSENTIAL READING:** The Textbook, “Towards a World of Equals: A Bilingual Textbook on Gender” written by A.Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu published by Telugu Akademi, Telangana Government in 2015.

ASSESSMENT AND GRADING:

- Discussion & Classroom Participation: 20%
- Project/Assignment: 30%
- End Term Exam: 50%

Course Outcomes:

- CO 1: Students will have developed a better understanding of important issues related to gender in contemporary India.
- CO 2: Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and films.
- CO 3: Students will attain a finer grasp of how gender discrimination works in our society and how to counter them. Students will acquire insights into the gendered division of labour and its relation to politics and economics.
- CO 4: Students will develop a sense of appreciation of women in all walks of life. Men and women students and professionals will be better equipped to work and live in harmony.
- CO 5: Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.