St. Johns College of Engineering & Technology (Autonomous)

(Accredited by NAAC, Approved by AICTE, Recognized by UGC under 2(f) & 12(B) An ISO 9001:2015 Certified Institution and Affiliated to JNTUA, Ananthapuramu)

Yerrakota, Yemmiganur-518360, Kurnool (Dist), Andhra Pradesh, India.

B.Tech (Regular-Full time)

(Effective for the students admitted into I-Year from the Academic Year **2024-25** onwards & Lateral Entry Students Admitted from the Academic Year **2025-26** onwards)

Civil Engineering

I & II YEAR COURSE STRUCTURE AND SYLLABUS

St.Johns College of Engineering and Technology
(AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

B.TECH. –CIVIL EGINEERING - COURSE STRUCTURE & SYLLABUS – R24

(Applicable from the academic year 2024-25 onwards)

INDUCTION PROGRAMME

S.No.	Course Name	Category	L-T-P-C
1	Physical Activities -- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2	Career Counselling	MC	2-0-2-0
3	Orientation to all branches -- career options, tools, etc.	MC	3-0-0-0
4	Orientation on admitted Branch -- corresponding labs, tools and platforms	MC	2-0-3-0
5	Proficiency Modules & Productivity Tools	MC	2-1-2-0
6	Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7	Remedial Training in Foundation Courses	MC	2-1-2-0
8	Human Values & Professional Ethics	MC	3-0-0-0
9	Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	BC	2-1-2-0
10	Concepts of Programming	ES	2-0-2-0

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

B.TECH. – I YEAR COURSE STRUCTURE & SYLLABI

B.Tech.–I Year I Semester

S.No.	Course code	Title	L	T	P	Credits
1	24G3A56101T	Engineering Physics	3	0	0	3
2	24G3A54101	Linear Algebra & Calculus	3	0	0	3
3	24G3A02101T	Basic Electrical & Electronics Engineering	3	0	0	3
4	24G3A03101T	Engineering Graphics	1	0	4	3
5	24G3A05101T	Introduction to Programming	3	0	0	3
6	24G3A05102	IT Workshop	0	0	2	1
7	24G3A56101P	Engineering Physics Lab	0	0	2	1
8	24G3A02101P	Electrical & Electronics Engineering Workshop	0	0	3	1.5
9	24G3A05101P	Computer Programming Lab	0	0	3	1.5
10	24G3A99101	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
Total			**13**	**00**	**15**	**20.5**

B.Tech. I Year II Semester

S.No.	Course code	Title	L	T	P	Credits
1	24G3A52201T	Communicative English	2	0	0	2
2	24G3A51201T	Engineering Chemistry	3	0	0	3
3	24G3A54201	Differential Equations & Vector Calculus	3	0	0	3
4	24G3A01201T	Basic Civil & Mechanical Engineering	3	0	0	3
5	24G3A01202T	Engineering Mechanics	3	0	0	3
6	24G3A52201P	Communicative English Lab	0	0	2	1
7	24G3A51201P	Engineering Chemistry Lab	0	0	2	1
8	24G3A03201	Engineering Workshop	0	0	3	1.5
9	24G3A01202P	Engineering Mechanics & Building Practices Lab	0	0	3	1.5
10	24G3A99201	Health and wellness, Yoga and Sports	-	-	1	0.5
Total			**14**	**00**	**11**	**19.5**

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

B.TECH. – II YEAR COURSE STRUCTURE & SYLLABI

B.Tech. II Year I Semester

S.NO	Subject Code	Title	L	T	P	Credits
1	24G3A54406	Numerical & Statistical Methods	3	0	0	3
2	24G3A52301	Universal Human Values 2- Understanding Harmony and Ethical human conduct	2	1	0	3
3	24G3A01301T	Surveying	3	0	0	3
4	24G3A01302T	Strength of Materials	3	0	0	3
5	24G3A01303	Fluid Mechanics	3	0	0	3
6	24G3A01301P	Surveying Lab	0	0	3	1.5
7	24G3A01302P	Strength of Materials Lab	0	0	3	1.5
8	24G3A01304	Building Planning and Drawing	0	1	2	2
9	24G3A99301	Environmental Science	2	0	0	-
		Total	**16**	**02**	**08**	**20**

B.Tech. II Year II Semester

S.NO	Subject Code	Title	L	T	P	Credits
1	24G3A52402a 24G3A52402b 24G3A52402c	Managerial Economics and Financial Analysis Organizational Behavior Business Environment	2	0	0	2
2	24G3A01401T	Engineering Geology	3	0	0	3
3	24G3A01402T	Concrete Technology	3	0	0	3
4	24G3A01403	Structural Analysis	3	0	0	3
5	24G3A01404	Hydraulics & Hydraulic Machinery	3	0	0	3
6	24G3A01402P	Concrete Technology Lab	0	0	3	1.5
7	24G3A01401P	Engineering Geology lab	0	0	3	1.5
8	24G3A52403	Soft Skills	0	1	2	2
9	24G3A99401	Design Thinking & Innovation	1	0	2	2
		Total	**15**	**01**	**10**	**21**
Mandatory Community Service Project Internship of 08 Weeks duration during Summer Vacation						

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING PHYSICS

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A56101T	BS&H	3	0	0	3	30	70	100

Course Objectives:

- To bridge the gap between the Physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Analyze the intensity variation of light due to polarization, interference and diffraction.
CO2:	Familiarize with the basics of crystals and their structures.
CO3:	Summarize various types of polarization of dielectrics and classify the magnetic materials.
CO4:	Explain fundamentals of quantum mechanics and apply it to one dimensional motion of particles and the band theory of solids.
CO5:	Identify the type of semiconductor using Hall effect.

UNIT-I: Wave Optics
Interference: Introduction - Principle of superposition –Interference of light - Interference in thin films (Reflection Geometry) & applications - Colours in thin films- Newton's Rings, Determination of wavelength and refractive index. **Diffraction:** Introduction - Fresnel and Fraunhofer diffractions - Fraunhofer diffraction due to single slit, double slit & N-slits (Qualitative) – Diffraction Grating - Dispersive power and resolving power of Grating (Qualitative). **Polarization:** Introduction -Types of polarization - Polarization by reflection, refraction and Double refraction - Nicol's Prism -Half wave and Quarter wave plates.
UNIT-II: Crystallography and X-ray diffraction
Crystallography: Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (h k l) planes. **X-ray diffraction:** Bragg's law - X-ray Diffractometer – crystal structure determination by Laue's and powder methods.
UNIT-III: Dielectric and Magnetic Materials
Dielectric Materials: Introduction - Dielectric polarization - Dielectric polarizability, Susceptibility, Dielectric constant and Displacement Vector – Relation between the electric vectors - Types of polarizations- Electronic (Quantitative), Ionic (Quantitative) and Orientation polarizations (Qualitative) - Lorentz internal field - Clausius- Mossotti equation - complex dielectric constant – Frequency dependence of polarization – dielectric loss. **Magnetic Materials:** Introduction - Magnetic dipole moment - Magnetization-

Magnetic susceptibility and permeability – Atomic origin of magnetism - Classification of magnetic materials: Dia, para, Ferro, anti-ferro & Ferri magnetic materials - Domain concept for Ferromagnetism & Domain walls (Qualitative) - Hysteresis - soft and hard magnetic materials.
UNIT-IV: Quantum Mechanics and Free electron theory
Quantum Mechanics: Dual nature of matter – Heisenberg's Uncertainty Principle – Significance and properties of wave function – Schrodinger's time independent and dependent wave equations– Particle in a one-dimensional infinite potential well. **Free Electron Theory:** Classical free electron theory (Qualitative with discussion of merits and demerits) – Quantum free electron theory – electrical conductivity based on quantum free electron theory - Fermi-Dirac distribution - Density of states - Fermi energy.
UNIT-V: Semiconductors
Semiconductors: Semiconductors: Formation of energy bands – classification of crystalline solids - Intrinsic semiconductors: Density of charge carriers – Electrical conductivity – Fermi level – Extrinsic semiconductors: density of charge carriers – dependence of Fermi energy on carrier concentration and temperature - Drift and diffusion currents – Einstein's equation – Hall effect and its applications.

Textbooks:

1. M. N. Avadhanulu, P.G. Kshirsagar & T.V.S.Arun Murthy, A Textbook of Engineering Physics, S Chand Publications, Eleventh Edition, 2019.
2. Engineering Physics - D.K.Bhattacharya and Poonam Tandon, Oxford press (2015).

Reference Books:

1. Engineering Physics - B.K. Pandey and S. Chaturvedi, Cengage Learning 2021.
2. Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
3. Engineering Physics" - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press. 2010
4. Engineering Physics - M.R. Srinivasan, New Age international publishers (2009).

Online Learning Resources:

https://www.youtube.com/watch?v=2XOQXgj18Qk
https://www.youtube.com/watch?v=UXqWixel_f8
https://www.youtube.com/watch?v=DocyilQj8yE
https://www.youtube.com/watch?v=GzE7__dxxAU&list=PLDVC8J0Twuc9DCeiUaM0PRakAqalYwmP&index=2
https://www.youtube.com/watch?v=3WW60S48f-s

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

LINEAR ALGEBRA & CALCULUS

(Common to All Branches of Engineering)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A54101	BS&H	3	0	0	3	30	70	100

Course Objectives:

- To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various real-world problems and their applications.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Develop and use of matrix algebra techniques that are needed by engineers for the practical applications
CO2:	Utilize mean value theorems to real life problems
CO3:	Familiarize with functions of several variables which is useful in optimization
CO4:	Learn important tools of calculus in higher dimensions.
CO5:	Familiarize with double and triple integrals of functions of several variables in two dimensions using Cartesian and polar coordinates and in three dimensions using cylindrical and spherical coordinates.

UNIT-I: Matrices
Rank of a matrix by echelon form. Cauchy–Binet formulae (without proof). 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, Jacobi and Gauss Seidel Iteration Methods.
UNIT-II: Eigen values, Eigenvectors and Orthogonal Transformation
Eigen values, Eigenvectors of Real Matrices and their properties, Diagonalization of a matrix, Cayley Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley Hamilton Theorem, Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical forms by Orthogonal Transformation.
UNIT-III: Calculus
Mean Value Theorems: Rolle's Theorem, Lagrange's mean value theorem with their geometrical interpretation, Cauchy's mean value theorem, Taylor's and Maclaurin theorems with remainders (without proof), Problems and applications on the above theorems.
UNIT-IV: Partial differentiation and Applications (Multi variable calculus)
Functions of several variables: Limit, Continuity and Differentiability, Partial derivatives, total derivatives, chain rule, Taylor's and Maclaurin's series expansion of functions of two variables. Jacobians, Functional dependence, maxima and minima of functions of two variables, method of Lagrange multipliers.
UNIT-V: Multiple Integrals (Multi variable Calculus)
Double integrals, triple integrals, change of order of integration, change of variables to polar, cylindrical and spherical coordinates. Finding areas (by double integrals) and volumes (by double integrals and triple integrals).

Textbooks:

1. Advanced Engineering Mathematics, Micheael Greenberg,, Pearson publishers, 9 thedition.
2. Higher Engineering Mathematics, H. K Das, Er. RajnishVerma, S. Chand Publications, 2014, Third Edition (Reprint 2021)

Reference Books:

1. Higher Engineering Mathematics, B.S.Grewal,KhannaPublishers,2017, 44th Edition
2. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley &Sons, 2018, 10th Edition.
3. Thomas Calculus, George B.Thomas, MauriceD. Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.
4. Advanced Engineering Mathematics, R.K. Jainand, S.R.K.Iyengar, Alpha Science International Ltd., 2021 5th Edition (9th reprint).
5. Advanced Modern Engineering Mathematics, GlynJames, Pearson publishers, 2018 5 th Edition.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Common to All branches of Engineering)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02101T	ES	3	0	0	3	30	70	100

Course Objectives:

- To expose to the field of electrical & electronics engineering, laws and principles of electrical/ electronic engineering and to acquire fundamental knowledge in the relevant field.

PART-A: BASIC ELECTRICAL ENGINEERING

Course Outcomes:

After the completion of the course students will be able to

CO1:	Analyze the behavior of DC and AC circuits using fundamental laws and theorems, including the application of phasor diagrams and impedance concepts.
CO2:	Evaluate the performance and applications of various electrical machines and measuring instruments by understanding their construction and operating principles.
CO3:	Apply knowledge of energy resources, electricity billing, and safety measures to solve real-world electrical engineering problems related to power generation and household electrical safety.

UNIT-I: DC &AC Circuits
DC Circuits: Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL & KVL, series, parallel, series-parallel circuits, Super Position theorem, Simple numerical problems. **AC Circuits:** A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept of Impedance, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems).
UNIT-II: Machines and Measuring Instruments
Machines: Construction, principle and operation of (i) DC Motor, (ii) DC Generator, (iii) Single Phase Transformer, (iv)Three Phase Induction Motor and (v)Alternator, Applications of electrical machines. **Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments and Wheat Stone bridge.
UNIT-III: Energy Resources, Electricity Bill & Safety Measures
Energy Resources: Conventional and non-conventional energy resources; Layout and operation of various Power Generation systems: Hydel, Nuclear, Solar & Wind power generation. **Electricity bill:** Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.

Equipment Safety Measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

Textbooks:

1. Basic Electrical Engineering,D. P. Kothari and I. J. Nagrath,Mc Graw Hill, 2019,Fourth Edition
2. Principles of Power Systems, V.K. Mehtha, S. Chand Technical Publishers, 2020
3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017
4. Basic Electrical and Electronics Engineering, S. K.Bhatacharya, Person Publications, 2018, Second Edition.

Web Resources:

1. https://nptel.ac.in/courses/108105053
2. https://nptel.ac.in/courses/108108076

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

PART-B: BASIC ELECTRONICS ENGINEERING

Course Outcomes:

After the completion of the course students will be able to

CO1:	Apply the concept of science and mathematics to understand the working of diodes, transistors.
CO2:	Understand the operation of electronic circuits such as Rectifiers, power supplies, and Electronic Instrumentation
CO3:	Familiarize with the number systems, codes, Boolean algebra and logic gates and understand the working mechanism of different combinational, sequential circuits and their role in the digital systems.

UNIT-I: SEMICONDUCTOR DEVICES
Introduction - Evolution of electronics – Vacuum tubes to nano electronics - Characteristics of PN Junction Diode — Zener Effect — Zener Diode and its Characteristics. Bipolar Junction Transistor — CB, CE, CC Configurations and Characteristics — Elementary Treatment of Small Signal CE Amplifier
UNIT-II: BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION
Rectifiers and power supplies: Block diagram description of a dc power supply, working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator. Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response. Electronic Instrumentation: Block diagram of an electronic instrumentation system.
UNIT-III: DIGITAL ELECTRONICS
Overview of Number Systems, Logic gates including Universal Gates, BCD codes, Excess-3 code, Gray code, Hamming code. Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits–Half and Full Adder, Introduction to sequential circuits, Flip flops, Registers and counters (Elementary Treatment only)

Textbooks:

1. R.L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R.P.Jain, Modern Digital Electronics, 4th Edition, Tata McGrawHill, 2009

Reference Books:

1. R.S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand & Co, 2010.
2. Santiram Kal, Basic Electronics - Devices, Circuits and IT Fundamentals, Prentice Hall, India,2002.
3. R.T.Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING GRAPHICS

(Common to all branches of Engineering)

I Year B. Tech (CE, ME, ECE, CSD, AIML)–I Semester

I Year B. Tech (EEE, CSE, CAI) – II Semester

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A03101T	ES	1	0	4	3	30	70	100

Course Objectives:

- To enable the students with various concepts like dimensioning, conventions and standards related to Engineering Drawing
- To impart knowledge on the projection of points, lines and plane surfaces
- To improve the visualization skills for better understanding of projection of solids
- To develop the imaginative skills of the students required to understand Section of solids and Developments of surfaces.
- To make the students understand the viewing perception of a solid object in Isometric and Perspective projections.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the principles of engineering drawing, including engineering curves Including cycloids and involutes
CO2:	Draw and interpret orthographic projections of points, lines in front, top views.
CO3:	Understandanddrawprojectionofplanesandsolidsinvariouspositionsinfirstquadrant.
CO4:	Explain principles of sections of solids
CO5:	Prepare isometric and development of simple solids.

UNIT-I: Introduction to Engineering Drawing:
Principles of Engineering Drawing and its significance Conventions in drawing-lettering - BIS conventions. a) Conic sections-using Eccentricity method, oblong method, concentric circle method including the rectangular hyperbola b) Cycloid, epicycloids and hypocycloid c) Involutes.
UNIT-II: Projections of Points and Projections of Lines
Projections of Points: Projections of Points in all the quadrants. **Projections of Lines:** Projections of Straight Lines-Parallel to one and inclined to other plane, inclined to planes, determination of true lengths, angle of inclinations.
UNIT-III: Projections of Planes and Projections of Solids
Projections of Planes: Regular Planes, Plane Perpendicular to one plane and Parallel to another Reference plane, Plane inclined to one of the principal plane and perpendicular to the other Plane. Plane inclined to both the planes. **Projections of Solids:** Prisms, Pyramids, Cones and Cylinders with the axis perpendicular to one plane and parallel to the reference plane, Plane inclined to one reference Plane and parallel to other.
UNIT-IV: Sections of solids

Sections of solids: Sectioning of prism, pyramid, cone and cylinder– sectional view–true shape. Section of plane parallel to one principal plane, Section of plane Inclined to one principal plane and perpendicular to other. Section of plane perpendicular to both H.P and V.P.
UNIT-V: Development of surface of solids and Conversion of Views
Development of surface of solids: Development of surfaces of right regular solids and their sections - prism, pyramid, cylinder and cone. **Conversion of Views:** Conversion of isometric views to orthographic views.

Textbooks:

1. Engineering Drawing. K.L Narayana, P. Kannaiah, Scitech Publications, 2011
2. Engineering Drawing by N.D.Bhatt, ChariotPublications,2014

Reference Books:

1. K. Venugopal, Engineering Drawing and Graphics with Auto CAD, Fourth Edition, 2001, New Age International (P) Limited, Publishers, New Delhi, 2001.
2. Dhananjay A Jolhe, Engineering Drawing with an introduction to Auto CAD,Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2008.
3. M.B.Shaw &B.C.Rana, Engineering Drawing,Second Edition Pearson Education,New Delhi, 2009.
4. Engineering Drawing, B.V.RGupta ,J.K. Publishers,2008
5. K.V.Natarajan,„ Atext book of Engineering Graphics", Dhanalakshmi publishers, Chennai, 2006.

Additional Sources:

https://archive.nptel.ac.in/courses/112/102/112102304/https://www.youtube.com/watch?v=p62LPzFqGQw&list=PLp6ek2hDcoNCjoRLQ4rjpCozisCACBxKA

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

INTRODUCTION TO PROGRAMMING

(Common to All branches of Engineering)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A05101T	ES	3	0	0	3	30	70	100

Course Objectives:

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects.

Course Outcomes:

A student after completion of the course will be able to

CO1:	Understand basics of computers, the concept of algorithm and algorithmic thinking.
CO2:	Apply appropriate Control structures to solve problems.
CO3:	Describe the concept of Arrays and Strings
CO4:	Write User defined functions and performing operations on Files
CO5:	Describe the concept of Pointers and Structures.

UNIT-1: Introduction to Programming and Problem Solving
History of Computers, Basic organization of a computer: ALU, input-output units, memory, program counter, Introduction to Programming Languages, Basics of a Computer Program- Algorithms, flowcharts (Using Dia Tool), pseudo code. Introduction to Compilation and Execution, Primitive Data Types, Variables, and Constants, Basic Input and Output, Operations, Type Conversion, and Casting. Problem solving techniques: Top-down approach, Bottom-up approach, Time and space complexities of algorithms.
UNIT-1I: Control Structures
Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while, do while) Break and Continue.
UNIT-III: Arrays and Strings
Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to Strings.
UNIT-1V: Pointers & User Defined Data types
Introduction to Functions, Function Declaration and Definition, Function call Return Types and Arguments, Recursion, modifying parameters inside functions using pointers, arrays as parameters. Scope and Lifetime of Variables, Basics of File Handling
UNIT-V: Functions & File Handling
Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers, User-defined data types-Structures and Unions.

Note: The syllabus is designed with C Language as the fundamental language of implementation**.**

Textbooks:

1. "The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice- Hall, 1988

2. Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

Reference Books:

1. Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education,
2008.

2. Programming in C, Rema Theraja, Oxford, 2016, 2nd edition

3. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

IT WORKSHOP

(Common to all branches of Engineering)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A05102	ES	0	0	2	1	30	70	100

Course Objectives:

- To introduce the internal parts of a computer, peripherals, I/O ports, connecting cables
- To demonstrate configuring the system as Dual boot both Windows and other Operating Systems Viz. Linux, BOSS
- To teach basic command line interface commands on Linux.
- To teach the usage of Internet for productivity and self-paced life-long learning
- To introduce Compression, Multimedia and Antivirus tools and Office Tools such as Word processors, Spread sheets and Presentation tools.

Course Outcomes:

CO1:	Perform Hardware troubleshooting.
CO2:	Understand Hardware components and inter dependencies.
CO3:	Safeguard computer systems from viruses/worms.
CO4:	Document/ Presentation preparation.
CO5:	Perform calculations using spreadsheets.

PC Hardware & Software Installation

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot (VMWare) with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task 5: Every student should install BOSS on the computer. The system should be configured as dual boot (VMWare) with both Windows and BOSS. Lab instructors should verify the installation and follow it up with a Viva

Internet & World Wide Web

Task1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with

the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

LaTeX and WORD

Task 1 – Word Orientation: The mentor needs to give an overview of La TeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of La TeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using La TeXand word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using La TeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both La TeX and Word.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

EXCEL

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 2: Calculating GPA -. Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function,

LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

POWER POINT

Task 1: Students will be working on basic power point utilities and tools which help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Task 3: Master Layouts (slide, template, and notes), Types of views (basic,

presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

AI TOOLS – ChatGPT

Task 1: Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing incomplete sentences to see how the model completes them.

Ex: Prompt: "You are a knowledgeable AI. Please answer the following question: What is the capital of France?"

Task 2: Creative Writing: Use the model as a writing assistant. Provide the beginning of a story

or a description of a scene, and let the model generate the rest of the content. This can be a fun way to brainstorm creative ideas

Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating upwards. Write a story about how society adapted to this new reality."

Task 3: Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it into another language. Compare the output to see how accurate and fluent the translations are.

Ex:

Prompt: "Translate the following English sentence to French: 'Hello, how are you doing today?'"

Reference Books:

1. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003

2. The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech, 2013, 3rd edition

3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education, 2012, 2nd edition

4. PC Hardware - A Handbook, Kate J. Chase, PHI (Microsoft)

5. LaTeX Companion, Leslie Lamport, PHI/Pearson.

6. IT Essentials PC Hardware and Software Companion Guide, David Anfins on and Ken Quamme. – CISCO Press, Pearson Education, 3rd edition

7. IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCO Press, Pearson Education, 3rd edition

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING PHYSICS LAB

I B.Tech– I Semester								SJCET-R24
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
24G3A56101P	**BS&H**	0	0	2	1	30	70	100

Course Objectives:

- To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Measurement of Optical parameters using optical instruments.
CO2:	Able to measure magnetic, dielectric parameters by various methods.
CO3:	Analyzing the basic properties of Semiconductors.
CO4:	Student Able estimate the various material properties.

List of Experiments

S.No.	Title of the Experiment
1	Determination of radius of curvature of a given Plano-convex lens by Newton's rings.
2	Determination of wavelengths of different spectral lines in mercury spectrum using diffraction grating in normal incidence configuration.
3	Verification of Brewster's law
4	Determination of dielectric constant using charging and discharging method.
5	Study the variation of B versus H by magnetizing the magnetic material (B-H curve).
6	Determination of wavelength of Laser light using diffraction grating.
7	Determination of dispersive power of a prism using spectrometer.
8	Determination of the resistivity of semiconductors by four probe methods.
9	Determination of the resistivity of semiconductors by four probe methods
10	Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
11	Determination of Hall voltage and Hall coefficient of a given semiconductor using Hall effect.
12	Determination of temperature coefficients of a thermistor.
13	Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
14	Determination of magnetic susceptibility by Kundt's tube method.
15	Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
16	Sonometer: Verification of laws of stretched string.

17	Determination of young's modulus for the given material of wooden scale by nonuniform bending (or double cantilever) method.
18	Determination of Frequency of electrically maintained tuning fork by Melde's experiment.
Note: Any 10 from the above experiments, out of which two may be conducted through virtual labs.	
Virtual Lab Experiments	
1.	To find the resolving power of prism:https://vlab.amrita.edu/index.php?sub=1&brch=281&sim=1524&cnt=1
2.	To determine Energy Band Gap of Semiconductor. https://bop-iitk.vlabs.ac.in/exp/energy-band-gap/
3.	Determination of refractive index of liquid using newton's rings experiment. https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=1520&cnt=1

Reference Books/Lab Manuals:	
1.	S. Balasubramanian, M.N. Srinivasan, A Textbook of Practical Physics, S Chand Publishers, 2017.

Web Resources

- www.vlab.co.in
- https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP

(Common to All branches of Engineering)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02101P	ES	0	0	3	1.5	30	70	100

Course Objectives:

- To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.

Activities:

1. Familiarization of commonly used Electrical & Electronic Workshop Tools: Bread board, Solder, cables, relays, switches, connectors, fuses, Cutter, plier, screwdriver set, wire stripper, flux, knife/blade, soldering iron, de-soldering pump etc.

- Provide some exercises so that hardware tools and instruments are learned to be used by the students.

2. Familiarization of Measuring Instruments like Voltmeters, Ammeters, multimeter, LCR-Q meter, Power Supplies, CRO, DSO, Function Generator, Frequency counter.

- Provide some exercises so that measuring instruments are learned to be used by the students.

3. Components:

- Familiarization/Identification of components (Resistors, Capacitors, Inductors, Diodes, transistors, IC's etc.) – Functionality, type, size, colour coding package, symbol, cost etc.

- Testing of components like Resistor, Capacitor, Diode, Transistor, ICs etc. - Compare values of components like resistors, inductors, capacitors etc with the measured values by using instruments

PART-A: ELECTRICAL ENGINEERING LAB

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

CO1:	Apply fundamental circuit laws such as Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL) to verify the behavior of electrical circuits through practical experiments.
CO2:	Analyze and interpret the results of experiments involving the measurement of resistance, power, and power factor using instruments like the Wheatstone bridge and single-phase wattmeter.
CO3:	Evaluate the performance characteristics of electrical machines, such as DC shunt generators and single-phase transformers, by conducting load tests and magnetization characteristic experiments.

List of experiments:

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Measurement of Resistance using Wheat stone bridge
4. Magnetization Characteristics of DC shunt Generator

5. Measurement of Power and Power factor using Single-phase wattmeter
6. Measurement of Earth Resistance using Megger
7. Calculation of Electrical Energy for Domestic Premises

Reference Books:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition

2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

Note: **Minimum Six Experiments to be performed.**

PART-B: ELECTRONICS ENGINEERING LAB

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

CO1:	Identify & testing of various electronic components.
CO2:	Understand the usage of electronic measuring instruments.
CO3:	Plot and discuss the characteristics of various electron devices.

List of Experiments:

1. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Plot V – I characteristics of Zener Diode and its application as voltage Regulator.
3. Implementation of half wave and full wave rectifiers
4. Plot Input & Output characteristics of BJT in CE and CB configurations
5. Frequency response of CE amplifier.
6. Simulation of RC coupled amplifier with the design supplied
7. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
8. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs.

Tools / Equipment Required: DC Power supplies, Multi meters, DC Ammeters, DC Voltmeters, AC Voltmeters, CROs, all the required active devices.

References:

1. R. L. Boylestad& Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.

2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009.

Note: Minimum Six Experiments to be performed. All the experiments shall be implemented using both Hardware and Software.

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DEPARTMENT OF CIVIL ENGINEERING

COMPUTER PROGRAMMING LAB

(Common to All branches of Engineering)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A05101P	ES	0	0	3	1.5	30	70	100

Course Objectives:

- The course aims to give students hands – on experience and train them on the concepts of the C- Programming language.

Course Outcomes:

CO1:	Read, understand, and trace the execution of programs written in C language.
CO2:	Select the right control structure for solving the problem.
CO3:	Develop C programs which utilize memory efficiently using programming constructs like pointers.
CO4:	Develop Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.

UNIT I

WEEK 1

Objective: Getting familiar with the programming environment on the computer and writing the first program.

Suggested Experiments/Activities:

Tutorial 1: Problem-solving using Computers.

Lab1: Familiarization with programming environment

i) Basic Linux environment and its editors like Vi, Vim & Emacs etc.

ii) Exposure to Turbo C, gcc

iii) Writing simple programs using printf(), scanf()

WEEK 2

Objective: Getting familiar with how to formally describe a solution to a problem in a series of finite steps both using textual notation and graphic notation.

Suggested Experiments /Activities:

Tutorial 2: Problem-solving using Algorithms and Flow charts.

Lab 1: Converting algorithms/flow charts into C Source code. Developing the algorithms/flowcharts for the following sample programs

i) Sum and average of 3 numbers

ii) Conversion of Fahrenheit to Celsius and vice versa

iii) Simple interest calculation

WEEK 3

Objective: Learn how to define variables with the desired data-type, initialize them with appropriate values and how arithmetic operators can be used with variables and constants.

Suggested Experiments/Activities:

Tutorial 3: Variable types and type conversions:

Lab 3: Simple computational problems using arithmetic expressions.

i) Finding the square root of a given number

ii) Finding compound interest

iii) Area of a triangle using heron's formulae

iv) Distance travelled by an object

UNIT II

WEEK 4

Objective: Explore the full scope of expressions, type-compatibility of variables & constants and operators used in the expression and how operator precedence works.

Suggested Experiments/Activities:

Tutorial4: Operators and the precedence and as associativity:

Lab4: Simple computational problems using the operator' precedence and associativity

i) Evaluate the following expressions.

a. A+B*C+(D*E) + F*G

b. A/B*C-B+A*D/3

c. A+++B---A

d. J= (i++) + (++i)

ii) Find the maximum of three numbers using conditional operator

iii) Take marks of 5 subjects in integers, and find the total, average in float

WEEK 5

Objective: Explore the full scope of different variants of "if construct" namely if-else, nullelse, if-else if*-else, switch and nested-if including in what scenario each one of them can be used and how to use them. Explore all relational and logical operators while writing conditionals for "if construct".

Suggested Experiments/Activities:

Tutorial 5: Branching and logical expressions:

Lab 5: Problems involving if-then-else structures.

i) Write a C program to find the max and min of four numbers using if-else.

ii) Write a C program to generate electricity bill.

iii) Find the roots of the quadratic equation.

iv) Write a C program to simulate a calculator using switch case.

v) Write a C program to find the given year is a leap year or not.

WEEK 6

Objective: Explore the full scope of iterative constructs namely while loop, do-while loop and for loop in addition to structured jump constructs like break and continue including when each of these statements is more appropriate to use.

Suggested Experiments/Activities:

Tutorial 6: Loops, while and for loops

Lab 6: Iterative problems e.g., the sum of series

i) Find the factorial of given number using any loop.

ii) Find the given number is a prime or not.

iii) Compute sine and cos series

iv) Checking a number palindrome

v) Construct a pyramid of numbers.

UNIT III

WEEK 7:

Objective: Explore the full scope of Arrays construct namely defining and initializing 1-D and 2-D and more generically n-D arrays and referencing individual array elements from the defined array. Using integer 1-D arrays, explore search solution linear search.

Suggested Experiments/Activities:

Tutorial 7: 1 D Arrays: searching.

Lab 7:1D Array manipulation, linear search

i) Find the min and max of a 1-D integer array.

ii) Perform linear search on1D array.

iii) The reverse of a 1D integer array

iv) Find 2's complement of the given binary number.

v) Eliminate duplicate elements in an array.

WEEK 8:

Objective: Explore the difference between other arrays and character arrays that can be used as Strings by using null character and get comfortable with string by doing experiments that will reverse a string and concatenate two strings. Explore sorting solution bubble sort using integer arrays.

Suggested Experiments/Activities:

Tutorial 8: 2 D arrays, sorting and Strings.

Lab 8: Matrix problems, String operations, Bubble sort

i) Addition of two matrices

ii) Multiplication two matrices

iii) Sort array elements using bubble sort

iv) Concatenate two strings without built-in functions

v) Reverse a string using built-in and without built-in string functions

St.Johns College of Engineering and Technology
(AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

UNIT IV

WEEK 9:

Objective: Explore pointers to manage a dynamic array of integers, including memory allocation & value initialization, resizing changing and reordering the contents of an array and memory de-allocation using malloc (), calloc (), realloc () and free () functions. Gain experience processing command-line arguments received by C

Suggested Experiments/Activities:

Tutorial 9: Pointers, structures and dynamic memory allocation

Lab 9: Pointers and structures, memory dereferences.

i) Write a C program to find the sum of a 1D array using malloc()

ii) Write a C program to find the total, average of n students using structures

iii) Enter n students data using calloc() and display failed students list

iv) Read student name and marks from the command line and display the student details along with the total.

v) Write a C program to implement realloc()

WEEK 10:

Objective: Experiment with C Structures, Unions, bit fields and self-referential structures (Singly linked lists) and nested structures

Suggested Experiments/Activities:

Tutorial 10: Bitfields, Self-Referential Structures, Linked lists

Lab10: Bitfields, linked lists

Read and print a date using dd/mm/yyyy format using bit-fields and differentiate the same without using bit- fields

i) Create and display a singly linked list using self-referential structure.

ii) Demonstrate the differences between structures and unions using a C program.

iii) Write a C program to shift/rotate using bitfields.

iv) Write a C program to copy one structure variable to another structure of the same type.

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UNIT V

WEEK 11:

Objective: Explore the Functions, sub-routines, scope and extent of variables, doing some experiments by parameter passing using call by value. Basic methods of numerical integration

Suggested Experiments/Activities:

Tutorial 11: Functions, call by value, scope and extent,

Lab 11: Simple functions using call by value, solving differential equations using Eulers theorem.

i) Write a C function to calculate NCR value.

ii) Write a C function to find the length of a string.

iii) Write a C function to transpose of a matrix.

iv) Write a C function to demonstrate numerical integration of differential equations using Euler's method

WEEK 12:

Objective: Explore how recursive solutions can be programmed by writing recursive functions that can be invoked from the main by programming at-least five distinct problems that have naturally recursive solutions.

Suggested Experiments/Activities:

Tutorial 12: Recursion, the structure of recursive calls

Lab 12: Recursive functions

i) Write a recursive function to generate Fibonacci series.

ii) Write a recursive function to find the lcm of two numbers.

iii) Write a recursive function to find the factorial of a number.

iv) Write a C Program to implement Ackermann function using recursion.

v) Write a recursive function to find the sum of series.

WEEK 13:

Objective: Explore the basic difference between normal and pointer variables, Arithmetic operations using pointers and passing variables to functions using pointers

Suggested Experiments/Activities:

Tutorial 13: Call by reference, dangling pointers

Lab 13: Simple functions using Call by reference, Dangling pointers.

i) Write a C program to swap two numbers using call by reference.

ii) Demonstrate Dangling pointer problem using a C program.

iii) Write a C program to copy one string into another using pointer.

iv) Write a C program to find no of lowercase, uppercase, digits and other characters using pointers.

WEEK14:

Objective: To understand data files and file handling with various file I/O functions. Explore the differences between text and binary files.

Suggested Experiments/Activities:

Tutorial 14: File handling

Lab 14: File operations

i) Write a C program to write and read text into a file.

ii) Write a C program to write and read text into a binary file using fread() and fwrite()

iii) Copy the contents of one file to another file.

iv) Write a C program to merge two files into the third file using command-line arguments.

v) Find no. of lines, words and characters in a file

vi) Write a C program to print last n characters of a given file.

Textbooks:

1. Ajay Mittal, Programming in C: A practical approach, Pearson.

2. Byron Gottfried, Schaum' s Outline of Programming with C, McGraw Hill

Reference Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice- Hall of India

2. C Programming, A Problem-Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE

(Common to All branches of Engineering)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A99101	BS&H	0	0	1	0.5	-	-	100

Course Objectives:

- The objective of introducing this course is to impart discipline, character, fraternity, teamwork, social consciousness among the students and engaging them in selfless service.

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

CO1:	Understand the importance of discipline, character and service motto.
CO2:	Solve some societal issues by applying acquired knowledge, facts, and techniques.
CO3:	Explore human relationships by analyzing social problems.
CO4:	Determine to extend their help for the fellow beings and downtrodden people.
CO5:	Develop leadership skills and civic responsibilities.

UNIT I: Orientation

General Orientation on NSS/NCC/ Scouts & Guides/Community Service activities, career guidance.

Activities:

i) Conducting –ice breaking sessions-expectations from the course-knowing personal talents and skills
ii) Conducting orientations programs for the students –future plans-activities-releasing road map etc.
iii) Displaying success stories-motivational biopics- award winning movies on societal issues etc.
iv) Conducting talent show in singing patriotic songs-paintings- any other contribution.

UNIT II: Nature & Care

Activities:

i) Best out of waste competition.
ii) Poster and signs making competition to spread environmental awareness.
iii) Recycling and environmental pollution article writing competition.
iv) Organizing Zero-waste day.
v) Digital Environmental awareness activity via various social media platforms. vi)Virtual demonstration of different eco-friendly approaches for sustainable living.

vii) Write a summary on any book related to environmental issues.

UNIT III: Community Service

Activities:

i) Conducting One Day Special Camp in a village contacting village-area leaders- Survey in the village, identification of problems- helping them to solve via media- authorities-experts-etc.

ii) Conducting awareness programs on Health-related issues such as General Health,
Mental health, Spiritual Health, HIV/AIDS, iii)Conducting consumer Awareness. Explaining various legal provisions etc.

iv) Women Empowerment Programmes- Sexual Abuse, Adolescent Health and Population Education.

Any other programmes in collaboration with local charities, NGOs etc

Reference Books:

1. Nirmalya Kumar Sinha & Surajit Majumder, *A Text Book of National Service Scheme*Vol;.I, Vidya Kutir Publication, 2021 (ISBN 978-81-952368-8-6)
2. *Red Book - National Cadet Corps* – Standing Instructions Vol I & II, Directorate General of NCC, Ministry of Defence, New Delhi
3. Davis M. L. and Cornwell D. A., "Introduction to Environmental Engineering", McGraw Hill, New York 4/e 2008
4. Masters G. M., Joseph K. and Nagendran R. "Introduction to Environmental Engineering and Science", Pearson Education, New Delhi. 2/e 2007 5.Ram Ahuja. *Social Problems in India*, Rawat Publications, New Delhi.

General Guidelines:

1. Institutes must assign slots in the Timetable for the activities.
2. Institutes are required to provide instructor to mentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totaling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

COMMUNICATIVE ENGLISH

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A52201T	BS&H	2	0	0	2	30	70	100

Course Objectives:

- The main objective of introducing this course, Communicative English, is to facilitate effective listening, Reading, Speaking and Writing skills among the students. It enhances the same in their comprehending abilities, oral presentations, reporting useful information and providing knowledge of grammatical structures and vocabulary. This course helps the students to make them effective in speaking and writing skills and to make them industry ready.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the context, topic, and pieces of specific information from social or Transactional dialogues.
CO2:	Apply grammatical structures to formulate sentences and correct word forms.
CO3:	Analyze discourse markers to speak clearly on a specific topic in formal and informal discussions.
CO4:	Evaluate reading / listening text sand to write summaries based on global –Comprehension of these texts.
CO5:	Create a coherent paragraph, essay, and resume.

UNIT-I: Lesson: HUMAN VALUES: Gift of Magi (Short Story)
Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions **Speaking:** Asking and answering general questions on familiar topics such as home family, work, studies and interests; introducing oneself and others **Reading:** Skimming to get the main idea of a text; scanning to look for specific pieces of Information **Writing:** Mechanics of Writing-Capitalization, Spellings, Punctuation-Parts of Sentences. **Grammar:** Parts of Speech, Basic Sentence Structures-forming questions **Vocabulary:** Synonyms, Antonyms, Affixes (Prefixes/Suffixes), Root words.
UNIT-II: Lesson: NATURE: The Brook by Alfred Tennyson (Poem)
Listening: Answering a series of questions about main ideas and supporting ideas after listening to audio texts. **Speaking**: Discussion in pairs /small groups on specific topics followed by short structure talks. **Reading**: Identifying sequence of ideas; recognizing verbal techniques that help

to link the ideas in a paragraph together. **Writing:** Structure of a paragraph - Paragraph writing (specific topics) **Grammar**: Cohesive devices -linkers, use of articles and zero article; prepositions **Vocabulary:** Homonyms, Homophones, Homographs.
UNIT-III: Lesson: BIOGRAPHY: Elon Musk
Listening: Listening for global comprehension and summarizing what is listened to. **Speaking:** Discussing specific topics in pairs or small groups and reporting what is discussed **Reading:** Reading a text in detail by making basic inferences-recognizing and interpreting specific context clues; strategies to use text clues for comprehension. **Writing:** Summarizing, Note-making, paraphrasing **Grammar:** Verbs - tenses; subject-verb agreement; Compound words, Collocations **Vocabulary**: Compound words, Collocations
UNIT-IV: Lesson: INSPIRATION: The Toys of Peace by Saki
Listening: Making predictions while listening to conversations/ transactional dialogues without video; listening with video. **Speaking:** Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions. **Reading**: Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships communicate processes or display complicated data. **Writing**: Letter Writing: Official Letters, Resumes **Grammar**: Reporting verbs, Direct & Indirect speech, Active & Passive Voice **Vocabulary**: Words often confused, Jargons
UNIT-V: Lesson: MOTIVATION: The Power of Intrapersonal Communication (An Essay)
Listening: Identifying key terms, understanding concepts and answering a series of relevant questions that test comprehension. **Speaking**: Formal oral presentations on topics from academic contexts **Reading**: Reading comprehension. **Writing**: Writing structured essays on specific topics. **Grammar**: Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement) **Vocabulary**: Technical Jargons

Textbooks:

1. Pathfinder: Communicative English for Undergraduate Students, 1st Edition, Orient Black Swan, 2023 (Units 1,2 & 3)

2. Empowering with Language by Cengage Publications, 2023 (Units 4 & 5)

Reference Books:

1. Dubey, Sham Ji & Co. English for Engineers, Vikas Publishers, 2020

2. Bailey, Stephen. Academic writing: A Handbook for International Students.

Routledge, 2014.

3. Murphy, Raymond. English Grammar in Use, Fourth Edition, Cambridge University Press, 2019.

4. Lewis, Norman. Word Power Made Easy- The Complete Handbook for Building a Superior Vocabulary. Anchor, 2014

Web Resources:

GRAMMAR:

1. www.bbc.co.uk/learningenglish
2. https://dictionary.cambridge.org/grammar/british-grammar/
3. www.eslpod.com/index.html
4. https://www.learngrammar.net/
5. https://english4today.com/english-grammar-online-with-quizzes/
6. https://www.talkenglish.com/grammar/grammar.aspx

VOCABULARY

1. https://www.youtube.com/c/DailyVideoVocabulary/videos
2. https://www.youtube.com/channel/UC4cmBAit8i_NJZE8qK8sfpA

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING CHEMISTRY

(Common to Civil, Mechanical Engineering)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A51201T	BS&H	3	0	0	3	30	70	100

Course Objectives:

- To familiarize engineering chemistry and its applications
- To impart the concept of soft and hard waters, softening methods of hard water
- To train the students on the principles and applications of ectro chemistry, polymers, surface chemistry, and cement

Course Outcomes:

After the completion of the course students will be able to

CO1:	Demonstrate the corrosion prevention methods and factors affecting corrosion.
CO2:	Explain the preparation, properties, and applications of thermoplastics & thermo setting, elastomers & conducting polymers.
CO3:	Explain calorific values, octane number, refining of petroleum and cracking of oils.
CO4:	Explain the setting and hardening of cement.
CO5:	Summarize the concepts of colloids, micelle and nano materials.

UNIT-I: Water Technology
Soft and hard water, Estimation of hardness of water by EDTA Method, Estimation of dissolved Oxygen - Boiler troubles –Priming, foaming, scale and sludge, Caustic embrittlement, Industrial water treatment – Specifications for drinking water, Bureau of Indian Standards (BIS) and World health organization (WHO) standards, Ion-exchange processes - desalination of brackish water, reverse osmosis (RO) and electro dialysis.
UNIT-II: Electrochemistry and Applications
Electrodes –electrochemical cell, Nernst equation, cell potential calculations. Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (NiCad), and lithium-ion batteries- working principle of the batteries including cell reactions; Fuel Cells-Basic Concepts, the principle and working of hydrogen-oxygen Fuel cell. Corrosion: Introduction to corrosion, electrochemical theory of corrosion, differential aeration cell corrosion, galvanic corrosion, metal oxide formation by dry electrochemical corrosion, Pilling Bed worth ratios and uses, Factors affecting the corrosion, cathodic and anodic protection, electroplating and electro less plating (Nickel and Copper).
UNIT-III: Polymers and Fuel Chemistry
Introduction to polymers, functionality of monomers, Mechanism of chain growth,

step growth polymerization. Thermoplastics and Thermo-setting plastics-: Preparation, properties and applications of poly styrene. PVC Nylon 6,6 and Bakelite. Elastomers – Preparation, properties and applications of Buna S, Buna N, Thiokol rubbers. Fuels – Types of fuels, calorific value of fuels, numerical problems based on calorific value; Analysis of coal (Proximate and Ultimate analysis), Liquid Fuels, refining of petroleum, Octane and Cetane number-alternative fuels- propane, methanol, ethanol and bio fuel-bio diesel.
UNIT-IV: Modern Engineering Materials
Composites- Definition, Constituents, Classification- Particle, Fiber and Structural reinforced composites, properties and Engineering applications Refractoriness-Classification, Properties, Factors affecting the refractory materials and Applications. Lubricants- Classification, Functions of lubricants, Mechanism, Properties of lubricating oils – Viscosity, Viscosity Index, Flash point, Fire point, Cloud point, saponification and Applications. Building materials- Portland Cement, constituents, Setting and Hardening of cement.
UNIT-V: Surface Chemistry and Nano materials
Introduction to surface chemistry, colloids, nanometals and nanometal oxides, micelle formation, synthesis of colloids (Braggs Method), chemical and biological methods of preparation of nonmetals and metal oxides, stabilization of colloids and nanomaterials by stabilizing agents, adsorption isotherm (Freundlich and Longmuir), BET equation (no derivation) applications of colloids and nanomaterials – catalysis, medicine, sensors, etc.

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
2. Peter Atkins, Juliode Paula and James Keeler, Atkins' Physical Chemistry,10/e, Oxford University Press, 2010.

Reference Books:

1. H.F.W. Taylor, Cement Chemistry,2/e,Thomas Telford Publications, 1997.
2. D.J. Shaw, Introduction to Colloids and Surface Chemistry, Butterworth-Heineman, 1992.
3. Textbook of Polymer Science, Fred W. Billmayer Jr, 3rd Edition

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

(Common to All Branches of Engineering)

I B.Tech– II Semester								SJCET-R24
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
24G3A54201	**ES**	3	0	0	3	30	70	100

Course Objectives:

- To enlighten the learners in the concept of differential equations and multivariable calculus.
- To furnish the learners with basic concepts and techniques at plus two level to lead them into advanced level by handling various real-world applications.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Solve the differential equations related to various engineering fields.
CO2:	Identify solution methods for partial differential equations that model physical processes
CO3:	Interpret the physical meaning of different operators such as gradient, curl and divergence.
CO4:	Estimate the work done against a field, circulation and flux using vector calculus

UNIT-I: Differential equations of first order and first degree
Linear differential equations – Bernoulli's equations- Exact equations and equations reducible to exact form. Applications: Newton's Law of cooling – Law of natural growth and decay- Electrical circuits.
UNIT-II: Linear differential equations with Constant Coefficients
Definitions, homogenous and non-homogenous, complimentary function, general solution, particular integral, Wronskian, Method of variation of parameters. Simultaneous linear equations, Applications to L-C-R Circuit problems and Simple Harmonic motion.
UNIT-III: Partial Differential Equations
Introduction and formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order linear equations using Lagrange's method. Homogeneous Linear Partial differential equations with constant coefficients.
UNIT-IV: Vector differentiation
Scalar and vector point functions, vector operator Del, Del applies to scalar point functions Gradient, Directional derivative, del applied to vector point functions- Divergence and Curl, vector identities.
UNIT-V: Vector integration
Line integral-circulation-work done, surface integral-flux, Green's theorem in the plane (without proof), Stoke's theorem (without proof), volume integral, Gauss Divergence theorem (without proof) and related problems.

Textbooks:

1. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Alpha Science International Ltd., 2021 5th Edition (9th reprint).

2. Higher Engineering Mathematics, B. V. Ramana, McGraw Hill Education, 2017

Reference Books:

1. Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers, 2017, 44th Edition.

2. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, 2018, 10th Edition.

3. Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.

4. Advanced Engineering Mathematics, Dennis G. Zill and Warren S. Wright, Jones and Bartlett, 2018.

5. Advanced Modern Engineering Mathematics, Glyn James, Pearson publishers, 2018, 5th Edition

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

BASICS OF CIVIL AND MECHANICAL ENGINEERING

(Common to All branches of Engineering)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01201T	ES	3	0	0	3	30	70	100

PART A: BASICS OF CIVIL ENGINEERING

Course Objectives:

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation's economy.
- Get familiarized with the importance of quality, conveyance and storage of water.
- Introduction to basic civil engineering materials and construction techniques.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society.
CO2:	Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying..
CO3:	Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation.
CO4:	Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated.
CO5:	Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology.

UNIT-I
Basics of Civil Engineering: Role of Civil Engineers in Society-Various Disciplines of Civil Engineering-Structural Engineering-Geo-technical Engineering-Transportation Engineering –Hydraulics and Water Resources Engineering -Environmental Engineering-Scope of each discipline –Building Construction and Planning-ConstructionMaterials-Cement-Aggregate-Bricks-Cementconcrete-Steel. Introduction to Prefabricated construction Techniques.
UNIT-II
Surveying: Objectives of Surveying-HorizontalMeasurements-AngularMeasurements-Introduction to Bearings Leveling instruments used for leveling -Simple problems on leveling and bearings-Contour mapping.
UNIT-III
Transportation Engineering: Importance of Transportation in Nation's economic development Types of Highway Pavements-Flexible Pavements and Rigid Pavements -Simple Differences. Basics of Harbor, Tunnel, Airport, and Railway Engineering. **Water Resources and Environmental Engineering**: Introduction, Sources of water-Quality of water-Specifications-Introduction to Hydrology–Rainwater Harvesting-Water Storage and Conveyance Structures (Simple introduction to Dams and Reservoirs).

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy,, Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers. 2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

Reference Books:

1. Surveying, Vol-I and Vol-II, S.K Duggal, Tata McGraw Hill Publishers 2019.FifthEdition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi.2016
3. Irrigation Engineering and Hydraulic Structures-Santosh Kumar Garg, Khanna Publishers, Delhi2023. 38thEdition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10thEdition.
5. IndianStandardDRINKINGWATER—SPECIFICATIONIS10500-2012

PART B: BASIC MECHANICAL ENGINEERING

Course Objectives: The students after completing the course are expected to

- Get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries.
- Explain different engineering materials and different manufacturing processes.
- Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the different manufacturing processes.
CO2:	Explain the basics of thermal engineering and its applications.
CO3:	Describe the working of different mechanical power transmission systems and power plants.
CO4:	Describe the basics of robotics and its applications.
CO5:	Acquiring knowledge of materials and their properties for engineering applications

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

UNIT-I: Introduction to Mechanical Engineering and Engineering Materials
Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society-Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors. **Engineering Materials-**Metals-Ferrous and Non-ferrous, Ceramics, Composite Materials.
UNIT-II: Manufacturing Processes and Thermal Engineering
Manufacturing Processes: Sand Casting**,** Arc and Gas welding, Conventional Machining Process: Lathe, Milling, Non- Conventional Machining Process: Abrasive Jet, Laser Beam, 3D printing. **Thermal Engineering** – Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles, IC engines, 2-Stroke and 4-Stroke engines, SI/CI Engines, Components of Electric and Hybrid Vehicles.
UNIT-III: Power plants, Mechanical Power Transmission and Robotics
Power plants–working principle of Steam, Diesel, Hydro, Nuclear power plants. **Mechanical Power Transmission-**Belt Drives, Chain Drives and their Applications, Gear Drives and their applications. **Introduction to Robotics-**Joints & links, configurations, and applications of robotics.

Textbooks:

1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt.Ltd.
2. A Textbook of Theory of Machines by S.S.Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.
3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

Reference Books:

1. AppuuKuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I
2. 3D printing & Additive Manufacturing Technology- L.Jyothish Kumar,Pulak M Pandey,Springer publications
3. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt.Ltd.
4. G.Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

Additional Sources:

https://onlinecourses.nptel.ac.in/noc24_me104/previewhttps://www.youtube.com/watch?v=FCF8QMV31H8&list=PLFW6lRTa1g83TjuxZs9VH4Yh3Ri6EbPps

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING MECHANICS

(Civil Engineering & allied branches)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01202T	PC	3	0	0	3	30	70	100

Course Objectives:

- To get familiarized with different types of force systems.
- To draw accurate free body diagrams representing forces and moments acting on a body to analyze the equilibrium of system of forces.
- To teach the basic principles of center of gravity, centroid and moment of inertia and determine them for different simple and composite bodies.
- To apply the Work-Energy method to particle motion.
- To understand the kinematics and kinetics of translational and rotational motion of rigid bodies.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the fundamental concepts in mechanics and determine the frictional forces for bodies in contact.
CO2:	Analyze different force systems such as concurrent, coplanar and spatial systems and calculate their resultant forces and moments.
CO3:	Calculate the centroids, center of gravity of different geometrical shapes.
CO4:	Apply the principles of work-energy and impulse-momentum to solve the problems of rectilinear and curvilinear motion of a particle.
CO5:	Solve the problems involving the translational and rotational motion of rigid bodies.

UNIT-I
Introduction to Engineering Mechanics–Basic Concepts. Scope and Applications **Systems of Forces:** Coplanar Concurrent Forces–Components in Space–Resultant–Moment of Force and its Application –Couples and Resultant of Force Systems. **Friction:** Introduction**,** limiting friction and impending motion, Coulomb's laws of dry friction, coefficient of friction, Cone of Static friction.
UNIT-II
Equilibrium of Systems of Forces: Free Body Diagrams, Lami's Theorem, Equations of Equilibrium of Coplanar Systems, Graphical method for the equilibrium, Triangle law of forces, converse of the law of polygon of forces condition of equilibrium, Equations of Equilibrium for Spatial System of forces, Numerical examples on spatial system of forces using vector approach, Analysis of plane trusses. Principle of virtual work with simple examples
UNIT-III

Centroid: Centroids of simple figures (from basic principles)–Centroids of Composite Figures. **Centre of Gravity:** Centre of gravity of simple body (from basic principles), Centre of gravity of composite bodies, Pappus theorems. **Area Moments of Inertia:** Definition–Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia. **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
Rectilinear and Curvilinear motion of a particle: Kinematics and Kinetics – D'Alembert's Principle - Work Energy method and applications to particle motion-Impulse Momentum method.
UNIT-V
Rigid body Motion: Kinematics and Kinetics of translation, Rotation about fixed axis and plane motion, Work Energy method and Impulse Momentum method.

Textbooks:

1. Engineering Mechanics,S. Timoshenko, D.H.Young, J.V.Rao, S.Pati., ,Mc Graw Hill Education 2017. 5thEdition.

2. Engineering Mechanics, P.C. Dumir. Sengupta and Srinivas V veeravalli, University press .2020. First Edition.

3. A Text book of Engineering Mechanics, S.S Bhavikatti.Newageinternationalpublications2018. 4thEdition.

Reference Books:

1. Engineering Mechanics, Statics and Dynamics, Rogers and M A.Nelson., McGraw Hill Education. 2017. First Edition.

2. Engineering Mechanics , Statics and Dynamics, I. H.Shames., PHI,2002. 4th Edition.

3. Engineering Mechanics, Volume-I: Statics, Volume- II: Dynamics, J.L. Meriam and L.G. Kraige., John Wiley, 2008. 6thEdition.

4. Introduction to Statics and Dynamics, Basudev Battachatia, Oxford University Press, 2014.Second Edition

5. Engineering Mechanics: Statics and Dynamics, Hibbeler R.C., Pearson Education, Inc., NewDelhi, 2022, 14thEdition

Additional Sources:

https://archive.nptel.ac.in/courses/112/106/112106286/

https://www.youtube.com/watch?v=nGfVTNfNwnk&list=PLOSWwFV98rfKXq2KBphJz 95rao7q8PpwT

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

COMMUNICATIVE ENGLISH LAB

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A52201P	BH&S	0	0	2	1	30	70	100

Course Objectives:

- The main objective of introducing this course, Communicative English Laboratory, is to expose the students to a variety of self-instructional, learner friendly modes of language learning. The students will get trained in basic communication skills and also make them ready to face job interviews.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the different aspects of the English language proficiency with emphasis on LSRW skills.
CO2:	Apply communication skills through various language learning activities.
CO3:	Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
CO4:	Evaluate and exhibit professionalism in participating in debates and group discussions.
CO5:	Create effective Course Objectives:

List of Topics:

1. Vowels & Consonants
2. Neutralization/Accent Rules
3. Communication Skills &JAM
4. Role Play or Conversational Practice
5. E-mail Writing
6. Resume Writing, Cover letter, SOP
7. Group Discussions-methods & practice
8. Debates-Methods &Practice
9. PPT Presentations/Poster Presentation
10. Interviews Skills
11. Describing (Persons, places, Things and Events)
12. Paraphrasing

Suggested Software:

- Walden Info tech
- K-Van Solutions

Reference Books:

1. Raman Meenakshi, Sangeeta Sharma. *Technical Communication.* Oxford Press.2018.
2. Taylor Grant: *English Conversation Practice*, Tata McGraw-Hill Education India,2016
3. Hewing's, Martin.Cambridge *Academic English* (B2).CUP, 2012.
4. J.Sethi & P.V. Dhamija. *A Course in Phonetics and Spoken English*, (2nd Ed), Kindle,2013

Web Resources:

Spoken English:

1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net
4. https://www.britishcouncil.in/english/online
5. http://www.letstalkpodcast.com/
6. https://www.youtube.com/c/mmmEnglish_Emma/featured
7. https://www.youtube.com/c/ArnelsEverydayEnglish/featured
8. https://www.youtube.com/c/engvidAdam/featured
9. https://www.youtube.com/c/EnglishClass101/featured
10. https://www.youtube.com/c/SpeakEnglishWithTiffani/playlists
11. https://www.youtube.com/channel/UCV1h_cBE0Drdx19qkTM0WNw

Voice & Accent:

1. https://www.youtube.com/user/letstalkaccent/videos
2. https://www.youtube.com/c/EngLanguageClub/featured
3. https://www.youtube.com/channel/UC_OskgZBoS4dAnVUgJVexc

https://www.youtube.com/channel/UCNfm92h83W2i2ijc5Xwp_IA

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING CHEMISTRY LAB

(Common to Civil, Mechanical Engineering)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A51201P	BH&S	0	0	2	1	30	70	100

Course Objectives:

- To verify the fundamental concepts with experiments

Course Outcomes:

After the completion of the course students will be able to

CO1:	Determine the cell constant and conductance of solutions.
CO2:	Prepare advanced polymer materials.
CO3:	Determine the physical properties like surface tension, adsorption and viscosity
CO4:	Estimate the Iron and Calcium in cement.
CO5:	Calculate the hardness of water.

List of Experiments:
1. Determination of Hardness of a groundwater sample.
2. Estimation of Dissolved Oxygen by Winkler's method
3. Determination of Strength of an acid in Pb-Acid battery
4. Preparation of a polymer (Bakelite)
5. Determination of percentage of Iron in Cement sample by Calorimetry
6. Estimation of Calcium in Portland cement
7. Preparation of nanomaterials by precipitation method.
8. Adsorption of acetic acid by charcoal
9. Determination of percentage Moisture content in a coal sample
10. Determination of Viscosity of lubricating oil by Redwood Viscometer 1
11. Determination of Viscosity of lubricating oil by Redwood Viscometer 2
12. Determination of Calorific value of gases by Junker's gas Calorimeter

*Students must be performed 10 experiments from the above list.

Reference:

"Vogel's Quantitative Chemical Analysis 6th Edition 6th Edition" Pearson• Publications by

1. J. Mendham, R.C. Denney, J.D. Barnes and B. Sivasankar

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING WORKSHOP

(Common to all branches of Engineering)

I Year B. Tech. (EEE, CSE, CAI)–I Semester

I Year B. Tech. (CE, ME, ECE, CSD)–II Semester

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A03201	ES	0	0	3	1.5	30	70	100

Course Objectives:

- To familiarize students with wood working, sheet metal operations, fitting and electrical house wiring skills

Course Outcomes:

After the completion of the course students will be able to

CO1:	Identify workshop tools and their operational capabilities.
CO2:	Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding.
CO3:	Apply fitting operations in various applications.
CO4:	Apply basic electrical engineering knowledge for House Wiring Practice
CO5:	Ability to make various basic prototypes in the trade of Tinsmithy such as rectangular tray, and open Cylinder

LISTOFEXPERIMENTS
Introduction to tools and equipment used in each trade
SECTION–I (Carpentry)
1. Dovetail joint
2. Half-lap joint
3. Mortise and Tenon joint
SECTION–II (Sheet Metal Working)
1. Tapered tray
2. Conical funnel
3. Elbow pipe
4. Brazing

SECTION–III (Fitting)
1. V–fitting
2. Stepped fitting
3. Half round fitting
SECTION–IV (Foundry& Welding)
1. Preparation of mould with single piece pattern.
2. Preparation of mould with split piece pattern.
3. Preparation of Lap Joint using Arc welding
4. Preparation of Butt Joint using Arc welding
SECTION–V (House wiring)
Familiarity with different types of basic electrical circuits and makes the following connections.
1. Parallel and series
2. Two-ways witch
3. Go down lighting
4. Tube light
5. Soldering of wires

Note: In each section a minimum of *TWO* exercises are to be carried out.

Text books:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.

2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

References:

1. Elements of Workshop Technology ,Vol.I by S.K.Hajra Choudhury &Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition

2. Workshop Practice by H.S .Bawa, Tata-Mc GrawHill, 2004.

3. Wiring Estimating, Costing and Contracting; SoniP. M.& Upadhyay P.A.;Atul Prakashan, 2021-22.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING MECHANICS & BUILDING PRACTICES LAB

(Civil Engineering & allied branches)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01202P	PC	0	0	3	1.5	30	70	100

Course Objectives: The students completing the course are expected to

- Verify the Law of Parallelogram of Forces and Lami's theorem.
- Determine the coefficients of friction of Static and Rolling friction and Centre of gravity of different plane Lamina.
- Understand the layout of a building, concepts of Non-Destructive Testing and different Alternative Materials.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Evaluate the coefficient of friction between two different surfaces and between the inclined plane and the roller.
CO2:	Verify Law of Parallelogram of forces and Law of Moment using force polygon and bell crank lever.
CO3:	Determine the Centre of gravity different configurations.
CO4:	Understand the Quality Testing and Assessment Procedures and principles of Non - Destructive Testing.
CO5:	Exposure to safety practices in the construction industry.

Students have to perform any 10 of the following Experiments:

List of Experiments:
1. To study various types of tools used in construction.
2. Forces in Pin Jointed Trusses
3. Experimental Proof of Lami's Theorem
4. Verification of Law of Parallelogram of Forces.
5. Determination of Center of Gravity of different shaped Plane Lamina.
6. Determination of coefficient of Static and Rolling Friction.
7. Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever
8. Study of Alternative Materials like M-sand, Flyash, Sea Sand etc.

9. Field-Visit to understand the Quality Testing-report.
10. Safety Practices in Construction industry
11. Demonstration of Non-Destructive Testing-using Rebound Hammer & UPV
12. Study of Plumbing in buildings.

References:

1. S. Timoshenko, D.H. Young, J.V. Rao, S. Pati., Engineering Mechanics, 5th Edition, McGraw Hill Education.
2. Hibbeler R.C., Engineering Mechanics: Statics and Dynamics, 14th Edition, Pearson Education, Inc., New Delhi, 2022

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

HEALTH AND WELLNESS, YOGA AND SPORTS

(Common to All branches of Engineering)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A99201	BS&H	0	0	1	0.5			100

Course Objectives:

- The main objective of introducing this course is to make the students maintain their mental and physical wellness by balancing emotions in their life. It mainly enhances the essential traits required for the development of the personality.

Course Outcomes:

After completion of the course the student will be able to

CO1:	Understand the importance of yoga and sports for Physical fitness and sound health.
CO2:	Demonstrate an understanding of health-related fitness components.
CO3:	Compare and contrast various activities that help enhance their health.
CO4:	Assess current personal fitness levels.
CO5:	Develop Positive Personality.

UNIT I

Concept of health and fitness, Nutrition and Balanced diet, basic concept of immunity Relationship between diet and fitness, Globalization and its impact on health, Body Mass Index (BMI) of all age groups.

Activities:

i) Organizing health awareness programmes in community

ii) Preparation of health profile

iii) Preparation of chart for balance diet for all age groups

UNIT II

Concept of yoga, need for and importance of yoga, origin and history of yoga in Indian context, classification of yoga, Physiological effects of Asanas- Pranayama and meditation, stress management and yoga, Mental health and yoga practice.

Activities:

Yoga practices – Asana, Kriya, Mudra, Bandha, Dhyana, Surya Namaskar

St.Johns College of Engineering and Technology
(AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

UNIT III

Concept of Sports and fitness, importance, fitness components, history of sports, Ancient and Modern Olympics, Asian games and Commonwealth games.

Activities:

i) Participation in one major game and one individual sport viz., Athletics, Volleyball, Basketball, Handball, Football, Badminton, Kabaddi, Kho-kho, Table tennis, Cricket etc.

ii) Practicing general and specific warm up, aerobics ii) Practicing cardio respiratory fitness, treadmill, run test, 9 min walk, skipping and running.

Reference Books:

1. Gordon Edlin, Eric Golanty. Health and Wellness, 14th Edn. Jones & Bartlett Learning, 2022
2. T.K.V.Desikachar. The Heart of Yoga: Developing a Personal Practice
3. Archie J.Bahm. Yoga Sutras of Patanjali, Jain Publishing Company, 1993
4. Wiseman, John Lofty, SAS Survival Handbook: The Ultimate Guide to Surviving Anywhere Third Edition, William Morrow Paperbacks, 2014
5. The Sports Rules Book/ Human Kinetics with Thomas Hanlon. -- 3rd ed. Human Kinetics, Inc.2014

General Guidelines:

1. Institutes must assign slots in the Timetable for the activities of Health/Sports/Yoga.
2. Institutes must provide field/facility and offer the minimum of five choices of as many as Games/Sports.
3. Institutes are required to provide sports instructor / yoga teacher to mentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totaling to 90 marks.

A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

NUMERICAL & STATISTICAL METHODS

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A54406	BS&H	3	0	0	3	30	70	100

Course Outcomes:

After successful completion of this course, the students should be able to:

COs	Statements	Blooms level
CO1	Apply numerical methods to solve algebraic and transcendental equations	L2, L3
CO2	Derive interpolating polynomials using interpolation formulae	L3, L5
CO3	Solve differential and integral equations numerically	L3
CO4	To identify real life problems into Mathematical Models.	L2, L3
CO5	To apply the probability theory and testing of hypothesis in the field of civil engineering Applications.	L3, L5

Pre-requisite: Basic algebraic Equations, Probability, random variables (discrete and continuous) and probability distributions.

UNIT I: Solution of Algebraic & Transcendental Equations
Introduction-Bisection Method-Iterative method, Regula-falsi method and Newton Raphson method System of Algebraic equations: Jacoby and Gauss Siedal method.
UNIT II Interpolation
Finite differences-Newton's forward and backward interpolation formulae – Lagrange's formulae. Curve fitting: Fitting of straight line, second-degree and Exponential curve by method of least squares.
UNIT III Solution of Initial value problems to Ordinary differential equations
Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's and modified Euler's methods-Runge-Kutta methods (second and fourth order).
UNIT IV Estimation and Testing of hypothesis, large sample tests
Estimation-parameters, statistics, sampling distribution, point estimation, Formulation of null hypothesis, alternative hypothesis, the critical and acceptance regions, level of significance, two types of errors and power of the test. Large Sample Tests: Test for single proportion, difference of proportions, test for single mean and difference of means. Confidence interval for parameters in one sample and two sample problems

UNIT V Small sample tests
Student t-distribution (test for single mean, two means and paired t-test), testing of equality of variances (F-test), x2 - test for goodness of fit, x2 - test for independence of attributes.

Textbooks:

1. S S Sastry, Introductory Methods of Numerical Analysis, PHI Learning Private Limited.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2017, 44th Edition
3. Miller and Freunds, Probability and Statistics for Engineers,7/e, Pearson, 2008.India.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 2018, 10^{th} Edition.
2. R.K.Jain and S.R.K.Iyengar, Advanced Engineering Mathematics, Alpha Science International Ltd.,2021 5^{th} Edition (9th reprint).
3. Ronald E. Walpole, Probability and Statistics for Engineers and Scientists, PNIE
4. H. K Das, Er. Rajnish Verma,Higher Engineering Mathematics, S. Chand Publications,2014, Third Edition (Reprint 2021)

Online Learning Resources:

1. https://onlinecourses.nptel.ac.in/noc17_ma14/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma05/preview
3. http://nptel.ac.in/courses/111105090

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

UNIVERSAL HUMAN VALUES – UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT

(Common to All Branches of Engineering)

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A52301	BS&H	2	1	0	3	30	70	100

Course Objectives:

- To help the students appreciate the essential complementary between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such holistic perspective forms the basis of Universal Human Values and movement towards value- based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

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

Course Topics

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

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

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

UNIT I

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

Lecture 1: Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)

Lecture 2: Understanding Value Education

Tutorial 1: Practice Session PS1 Sharing about Oneself Lecture 3: self-exploration as the Process for Value Education

Lecture4: Continuous Happiness and Prosperity – the Basic Human Aspirations

Tutorial 2: Practice Session PS2 Exploring Human Consciousness Lecture 5: Happiness and Prosperity – Current Scenario

Lecture 6: Method to Fulfill the Basic Human Aspirations Tutorial 3: Practice Session PS3 Exploring Natural Acceptance

UNIT II

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

Lecture 7: Understanding Human being as the Co-existence of the self and the body.

Lecture 8: Distinguishing between the Needs of the self and the body

Tutorial 4: Practice Session PS4 Exploring the difference of Needs of self and body.

Lecture 9: The body as an Instrument of the self Lecture 10: Understanding Harmony in the self

Tutorial 5: Practice Session PS5 Exploring Sources of Imagination in the self Lecture 11: Harmony of the self with the body

Lecture 12: Programme to ensure self-regulation and Health

Tutorial 6: Practice Session PS6 Exploring Harmony of self with the body

UNIT III

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

Lecture 13: Harmony in the Family – the Basic Unit of Human Interaction Lecture 14: 'Trust' – the Foundational Value in Relationship

Tutorial 7: Practice Session PS7 Exploring the Feeling of Trust Lecture 15: 'Respect' – as the Right Evaluation

Tutorial 8: Practice Session PS8 Exploring the Feeling of Respect Lecture 16: Other Feelings, Justice in Human-to-Human Relationship Lecture 17: Understanding Harmony in the Society

Lecture 18: Vision for the Universal Human Order

Tutorial 9: Practice Session PS9 Exploring Systems to fulfil Human Goal

UNIT IV

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

Lecture 19: Understanding Harmony in the Nature

Lecture 20: Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature

Tutorial 10: Practice Session PS10 Exploring the Four Orders of Nature Lecture 21: Realizing Existence as Co-existence at All Levels

Lecture 22: The Holistic Perception of Harmony in Existence

Tutorial 11: Practice Session PS11 Exploring Co-existence in Existence

UNIT V

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

Lecture 23: Natural Acceptance of Human Values Lecture 24: Definitiveness of (Ethical) Human Conduct

Tutorial 12: Practice Session PS12 Exploring Ethical Human Conduct

Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order

Lecture 26: Competence in Professional Ethics

Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education

Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies

Lecture 28: Strategies for Transition towards Value-based Life and Profession

Tutorial 14: Practice Session PS14 Exploring Steps of Transition towards Universal Human Order

Practice Sessions for UNIT I – Introduction to Value Education

PS1 Sharing about Oneself

PS2 Exploring Human Consciousness PS3 Exploring Natural Acceptance

Practice Sessions for UNIT II – Harmony in the Human Being PS4 Exploring the difference of Needs of self and body

PS5 Exploring Sources of Imagination in the self PS6 Exploring Harmony of self with the body

Practice Sessions for UNIT III – Harmony in the Family and Society PS7 Exploring the Feeling of Trust

PS8 Exploring the Feeling of Respect

PS9 Exploring Systems to fulfil Human Goal

Practice Sessions for UNIT IV – Harmony in the Nature (Existence) PS10 Exploring the Four Orders of Nature

PS11 Exploring Co-existence in Existence

Practice Sessions for UNIT V – Implications of the Holistic Understanding – a Look at Professional Ethics

PS12 Exploring Ethical Human Conduct

PS13 Exploring Humanistic Models in Education

PS14 Exploring Steps of Transition towards Universal Human Order

READINGS:

Textbook and Teachers Manual

a. The Textbook

R R Gaur, R Asthana, G P Bagaria, *A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

b. The Teacher's Manual

R R Gaur, R Asthana, G P Bagaria, *Teachers' Manual for A Foundation Course in Human Values and Professional Ethics,* 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books

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

Mode of Conduct:

Lecture hours are to be used for interactive discussion, placing the proposals about the topics at hand and motivating students to reflect, explore and verify them.

Tutorial hours are to be used for practice sessions.

While analyzing and discussing the topic, the faculty mentor's role is in pointing to essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements.

In the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and self- exploration.

Scenarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situations rather than" extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Tutorials (experiments or practical) are important for the course. The difference is that the laboratory is everyday life, and practical are how you behave and work in real life. Depending on the nature of topics, worksheets, home assignment and/or activity are included. The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic human values.

It is recommended that this content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content. Additional content may be offered in separate, higher courses. This course is to be taught by faculty from every teaching department, not exclusively by any one department.

Teacher preparation with a minimum exposure to at least one 8-day Faculty Development Program on Universal Human Values is deemed essential.

Online Resources

1. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%201-Introduction%20to%20Value%20Education.pdf
2. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%202-Harmony%20in%20the%20Human%20Being.pdf
3. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%203-Harmony%20in%20the%20Family.pdf
4. https://fdp-si.aicte-india.org/UHV%201%20Teaching%20Material/D3-S2%20Respect%20July%2023.pdf
5. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%205-Harmony%20in%20the%20Nature%20and%20Existence.pdf
6. https://fdp-si.aicte-india.org/download/FDPTeachingMaterial/3-days%20FDP-SI%20UHV%20Teaching%20Material/Day%203%20Handouts/UHV%203D%20D3-S2A%20Und%20Nature-Existence.pdf
7. https://fdp-si.aicte-india.org/UHV%20II%20Teaching%20Material/UHV%20II%20Lecture%2023-25%20Ethics%20v1.pdf
8. https://www.studocu.com/in/document/kiet-group-of-institutions/universal-human-values/chapter-5-holistic-understanding-of-harmony-on-professional-ethics/62490385

   https://onlinecourses.swayam2.ac.in/aic22_ge23/preview

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

SURVEYING

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01301T	PC	3	0	0	3	30	70	100

Course Objectives:

The objective of this course are to:

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

Course Outcomes:

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

UNIT - I

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

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

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

UNIT - II

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

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

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

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

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

UNIT - III

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

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

UNIT - IV

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

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

UNIT - V

Photogrammetry Surveying:

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

Text Books:

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

Reference Books:

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

4. Plane Surveying and Higher Surveying‖ by Chandra A M, New age International Pvt. Ltd.,Publishers, New Delhi, 3rd Edition, 2015.
5. Surveying and Levelling by N.Basak Tata McGraw Hill Publishing Co. Ltd. New Delhi, 4th edition, 2014.
6. Surveying (Vol 1, 2 & 3), by Arora K R, Standard Book House, Delhi. Edition: 12th, 2015.

Web Resources:

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

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

STRENGTH OF MATERIALS

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01302T	PC	3	0	0	3	30	70	100

Course Objectives:

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

Course Outcomes:

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

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

Shear Force and Bending Moment: Definition of beam — Types of beams — Concept of shear force and bending moment — Point of contra flexure — Relation between S.F., B.M and rate of loading at a section of a beam; S.F and B.M diagrams for cantilever, simply

supported and overhanging beams subjected to point loads, uniformly distributed loads, uniformly varying loads, partial uniformly distributed loads, couple and combination of these loads.

UNIT III:

Flexural and Shear Stresses:

Flexural Stresses: Theory of simple bending — Assumptions — Derivation of bending equation, Neutral axis — Determination of bending stresses — section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections — Design of simple beams

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

Torsion – circular shafts only.

UNIT IV:

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

UNIT V:

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

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

Textbooks:

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

2nd edition ,2024

References:

1. Advanced Mechanics of Solids, L.S Srinath, McGraw Hill Education, 2017, 3rd Edition
2. Strength of Materials - Fundamentals andApplications, T.D.Gunneswara Rao and Mudimby Andal, Cambridge University Press, 2018, 1st Edition
3. Mechanics of Materials, Beer and Johnston, McGraw Hill India Pvt. Ltd., 2020, 8th Edition (SI Units).
4. Mechanics of Solids — E P Popov, Prentice Hall, 2nd Edition, 2015.
5. A Textbook of Strength of Materials, by R. K. Rajput, 7e (Mechanics of Solids) SI Units S. Chand & Co, NewDelhi 7th edition 2022.
6. Strength of Materials by S.S.Ratan Tata McGrill Publications 3rd Edition , 2016.

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

FLUID MECHANICS

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01303	PC	3	0	0	3	30	70	100

Course Objectives:

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

Course Outcomes:

CO	Statement	Blooms level
CO 1	Understand the principles of fluid statics, kinematics and dynamics	**L2**
CO 2	Apply the laws of fluid statics and concepts of buoyancy	**L3**
CO 3	Understand the fundamentals of fluid kinematics and differentiate types of fluid flows	**L2**
CO 4	Apply the Principle of conservation of energy for flow measurement.	**L3**
CO 5	Analyse the losses in pipes and discharge through pipe network.	**L4**

UNIT I:
Basic concepts and definitions: Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; Variation of viscosity with temperature, Newton law of viscosity; Vapor pressure, Boiling point, Surface tension, Capillarity, Bulk modulus of elasticity, Compressibility
UNIT II:
Fluid statics: Fluid Pressure: Pressure at a point, Pascal's law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U Tube Differential Manometer. Pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces. Buoyancy and stability of floating bodies

UNIT III:
Fluid kinematics: Classification of fluid flow : steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; one, two and three dimensional flows; Stream line, path line, streak line and stream tube; stream function, velocity potential function. One, two and three Dimensional continuity equations in Cartesian coordinates.
UNIT IV:
Fluid Dynamics: Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – Derivation; Energy Principle; Practical applications of Bernoulli's equation: Venturimeter, orifice meter and Pitot tube; Momentum principle; Forces exerted by fluid flow on pipe bend; Vortex Flow – Free and Forced; Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number;
UNIT V:
Analysis Of Pipe Flow: Energy losses in pipelines; Darcy – Weisbach equation; Minor losses in pipelines; Hydraulic Grade Line and Total Energy Line; Concept of equivalent length – Pipes in Parallel and Series.

Textbooks:

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

References:

1. R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th edition, 2024.
2. N. Narayana Pillai, Principles of Fluid Mechanics and Fluid Machines, Universities Press Pvt Ltd, Hyderabad. 3rd Edition 2009.
3. Fluid Mechanics by Frank M. White, Henry Xue, Tata McGraw Hill, 9th edition , 2022.
4. C. S. P. Ojha, R. Berndtsson and P. N. Chadramouli, Fluid Mechanics and Machinery, Oxford University Press, 2010.
5. Introduction to Fluid Mechanics & Fluid Machines by S K Som, Gautam Biswas, S Chakraborty Tata McGraw Hill, 3rd edition 2011

Online Learning Resources:

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

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

SURVEYING LAB

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01301P	PC	0	0	3	1.5	30	70	100

Course Objectives:

- Know about various linear and angular measuring instruments
- Take Measurements in the linear and angular view 1.5
- Determine the area and volume by interpreting the data obtained from surveying activities
- Know modern equipment such as total station
- Draft field notes from survey data

Course Outcomes:

CO	Statement
CO 1	Handle various linear and angular measuring instruments
CO 2	Measure the linear and angular measurements
CO 3	Calculate the area and volume by interpreting the data obtained from surveying activities
CO 4	Handle modern equipment such as total station
CO 5	Prepare field notes from survey data

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

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DEPARTMENT OF CIVIL ENGINEERING

STRENGTH OF MATERIALS LAB

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01302P	PC	0	0	3	1.5	30	70	100

Course Objectives:

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

Course Outcomes:

CO	Statement
CO 1	Conduct tensile strength test and draw stress-strain diagrams for ductile metals
CO 2	Perform bending test and determine load-deflection curve of steel/wood
CO 3	Able to conduct torsion test and determine torsion parameters
CO 4	Perform hardness, impact and shear strength tests and calculate hardness numbers, impact and shear strengths
CO 5	Able to conduct tests on closely coiled and open coiled springs and calculate deflections

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

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DEPARTMENT OF CIVIL ENGINEERING

BUILDING PLANNING AND DRAWING

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01304	SEC	0	1	2	2	30	70	100

Course Objectives:

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

Course Outcomes:

CO	Statement
CO 1	Plan various buildings as per the building by-laws.
CO 2	Distinguish the relation between the plan, elevation and cross section and identify the form and functions among the buildings.
CO 3	Draw signs and bonds
CO 4	Draw different building units
CO 5	Learn the skills of drawing building elements and plan the buildings as per requirements.

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

Text Books:

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

Reference Books:

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

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DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL SCIENCE

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A99301	AC	2	0	0	0	30	-	30

Course Objectives:

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

UNIT-I

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

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

UNIT-II

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

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

Biodiversity and its Conservation : Introduction 0 Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-III

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

a. Air Pollution.
b. Water pollution
c. Soil pollution
d. Marine pollution

e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

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

UNIT-IV

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

UNIT-V

Human Population and the Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc..

Text Books:

1. Textbook of Environmental Studies for Undergraduate Courses Erach Bharucha for University Grants Commission, Universities Press.
2. Palaniswamy, “Environmental Studies”, Pearson education
3. S.Azeem Unnisa, “Environmental Studies” Academic Publishing Company
4. K.Raghavan Nambiar, “Text book of Environmental Studies for Undergraduate Courses as per UGC model syllabus”, Scitech Publications (India), Pvt. Ltd.

Reference Books:

1. Deeksha Dave and E.Sai Baba Reddy, “Textbook of Environmental Science”, Cengage Publications.
2. M.Anji Reddy, “Text book of Environmental Sciences and Technology”, BS Publication.
3. J.P.Sharma, Comprehensive Environmental studies, Laxmi publications.
4. J. Glynn Henry and Gary W. Heinke, “Environmental Sciences and Engineering”, Prentice hall of India Private limited
5. G.R.Chatwal, “A Text Book of Environmental Studies” Himalaya Publishing House 6. Gilbert M. Masters and Wendell P. Ela, “Introduction to Environmental Engineering and Science, Prentice hall of India Private limited.

1. https://www.coursera.org/learn/python-for-applied-data-science-ai
2. https://www.coursera.org/learn/python?specialization=python#syllabus

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DEPARTMENT OF CIVIL ENGINEERING

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A52402a	MC-I	2	0	0	2	30	70	100

Course Objectives:

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

Course Outcomes:

CO	Statement
CO 1	Define the concepts related to Managerial Economics, financial accounting and management(L2)
CO 2	Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
CO 3	Apply the Concept of Production cost and revenues for effective Business decision (L3)
CO 4	Analyze how to invest their capital and maximize returns (L4)
CO 5	Evaluate the capital budgeting techniques. (L5)
CO 6	Develop the accounting statements and evaluate the financial performance of business entity (L5)

UNIT-I
Managerial Economics: Introduction – Nature, meaning, significance, functions, and advantages. Demand-Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting- Factors governing Forecasting, Methods. Managerial Economics and Financial Accounting and Management.
UNIT-II
Production and Cost Analysis: Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least- cost combination– Short run and long run Production Function- Isoquants and Is costs, Cost & Break-Even Analysis - Cost concepts and Cost behaviour- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems).
UNIT-III
Business Organizations and Markets: Introduction – Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition Oligopoly-Price-Output

Determination - Pricing Methods and Strategies
UNIT-IV
Capital Budgeting: Introduction – Nature, meaning, significance. Types of Working Capital, Components, Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting– Features, Proposals, Methods and Evaluation. Projects – Pay Back Method, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)
UNIT-V
Financial Accounting and Analysis: Introduction – Concepts and Conventions-Double-Entry Bookkeeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Introduction to Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

Text Books:

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

Reference Books:

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

Online Learning Resources:

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

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DEPARTMENT OF CIVIL ENGINEERING

ORGANISATIONAL BEHAVIOUR

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A52402b	MC-I	2	0	0	2	30	70	100

Course Objectives:

- To enable student's comprehension of organizational behavior
- To offer knowledge to students on self-motivation, leadership and management
- To facilitate them to become powerful leaders
- To Impart knowledge about group dynamics
- To make them understand the importance of change and development

Course Outcomes:

CO	Statement
CO 1	Define the Organizational Behaviour, its nature and scope. (L2)
CO 2	Understand the nature and concept of Organizational behaviour (L2)
CO 3	Apply theories of motivation to analyse the performance problems (L3)
CO 4	Analyse the different theories of leadership (L4)
CO 5	Evaluate group dynamics (L5)
CO 6	Develop as powerful leader (L5)

UNIT-I
Introduction to Organizational Behavior: Meaning, definition, nature, scope and functions - Organizing Process – Making organizing effective -Understanding Individual Behaviour –Attitude -Perception - Learning – Personality.
UNIT-II
Motivation and Leading: Theories of Motivation- Maslow's Hierarchy of Needs - Hertzberg's Two Factor Theory - Vroom's theory of expectancy – Mc Cleland's theory of needs–Mc Gregor's theory X and theory Y– Adam's equity theory.
UNIT-III
Organizational Culture: Introduction – Meaning, scope, definition, Nature - Organizational Climate - Leadership - Traits Theory–Managerial Grid - Transactional Vs Transformational Leadership - Qualities of good Leader - Conflict Management - Evaluating Leader.
UNIT-IV
Group Dynamics: Introduction – Meaning, scope, definition, Nature- Types of groups - Determinants of group behaviour - Group process – Group Development - Group norms - Group cohesiveness - Small Groups - Group decision making - Team building - Conflict in the organization– Conflict resolution
UNIT-V
Organizational Change and Development: Introduction –Nature, Meaning, scope, definition and functions- Organizational Culture - Changing the Culture – Change Management – Work Stress Management - Organizational management – Managerial

implications of organization's change and development

Text Books:

1. Luthans, Fred, Organizational Behaviour, McGraw-Hill, 12 Th edition.
2. P Subba Ran, Organisational Behaviour, Himalya Publishing House.

Reference Books:

1. McShane, Organizational Behaviour, TMH
2. Nelson, Organisational Behaviour, Thomson.
3. Robbins, P. Stephen, Timothy A. Judge, Organisational Behaviour, Pearson.
4. Aswathappa, Organisational Behaviour, Himalaya.

Online Learning Resources:

https://www.slideshare.net/Knight1040/organizational-culture
9608857s://www.slideshare.net/AbhayRajpoot3/motivation-165556714
https://www.slideshare.net/harshrastogi1/group-dynamics-159412405
https://www.slideshare.net/vanyasingla1/organizational-change-development-26565951

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DEPARTMENT OF CIVIL ENGINEERING

BUSINESS ENVIRONMENT

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A52402c	MC-I	2	0	0	2	30	70	100

Course Objectives:

- To make the student to understand about the business environment
- To enable them in knowing the importance of fiscal and monitory policy
- To facilitate them in understanding the export policy of the country
- To Impart knowledge about the functioning and role of WTO
- To Encourage the student in knowing the structure of stock markets

Course Outcomes:

CO	Statement
CO 1	Define Business Environment and its Importance. (L2)
CO 2	Understand various types of business environment. (L2)
CO 3	Apply the knowledge of Money markets in future investment (L3)
CO 4	Analyze India's Trade Policy (L4)
CO 5	Evaluate fiscal and monitory policy (L5)
CO 6	Develop a personal synthesis and approach for identifying business opportunities (L5)

UNIT-I
Overview of Business Environment: Introduction – meaning Nature, Scope, significance, functions and advantages. Types Internal &External, Micro and Macro. Competitive structure of industries -Environmental analysis- advantages & limitations of environmental analysis.
UNIT-II
Fiscal & Monetary Policy: Introduction – Nature, meaning, significance, functions and advantages. Public Revenues - Public Expenditure - Evaluation of recent fiscal policy of GOI. Highlights of Budget- Monetary Policy - Demand and Supply of Money – RBI -Objectives of monetary and credit policy - Recent trends- Role of Finance Commission.
UNIT-III
India's Trade Policy: Introduction – Nature, meaning, significance, functions and advantages. Magnitude and direction of Indian International Trade - Bilateral and Multilateral Trade Agreements - EXIM policy and role of EXIM bank -Balance of Payments– Structure & Major components - Causes for Disequilibrium in Balance of Payments - Correction measures.
UNIT-IV
World Trade Organization: Introduction – Nature, significance, functions and

advantages. Organization and Structure - Role and functions of WTO in promoting world trade - GATT -Agreements in the Uruguay Round –TRIPS, TRIMS - Disputes Settlement Mechanism - Dumping and Anti-dumping Measures.
UNIT-V
Money Markets and Capital Markets: Introduction – Nature, meaning, significance, functions and advantages. Features and components of Indian financial systems - Objectives, features and structure of money markets and capital markets - Reforms and recent development – SEBI – Stock Exchanges - Investor protection and role of SEBI, Introduction to international finance

Text Books:

1. Francis Cherunilam, International Business: Text and Cases, Prentice Hall of India.
2. K. Aswathappa, Essentials of Business Environment: Texts and Cases & Exercises 13th Revised Edition.HPH

Reference Books:

1.K. V. Sivayya, V. B. M Das, Indian Industrial Economy, Sultan Chand Publishers, New Delhi, India.
2. Sundaram, Black, International Business Environment Text and Cases, Prentice Hall of India, New Delhi, India.
3. Chari. S. N, International Business, Wiley India.
4.E. Bhattacharya, International Business, Excel Publications, New Delhi.

Online Learning Resources:

https://www.slideshare.net/ShompaDhali/business-environment-53111245
https://www.slideshare.net/rbalsells/fiscal-policy-ppt
https://www.slideshare.net/aguness/monetary-policy-presentationppt
https://www.slideshare.net/DaudRizwan/monetary-policy-of-india-69561982
https://www.slideshare.net/ShikhaGupta31/indias-trade-policyppt
https://www.slideshare.net/viking2690/wto-ppt-60260883
https://www.slideshare.net/prateeknepal3/ppt-mo

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING GEOLOGY

II B.Tech– II Semester								SJCET-R24
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
24G3A01401T	**ES**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	0	0	3	30	70	100

Course Objectives:

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

Course Outcomes:

CO	Statement
CO 1	Understand the significance of geological agents on Earth surface and its significance in Civil Engineering.
CO 2	Identify and understand the properties of Minerals and Rocks.
CO 3	Understand the concepts of Groundwater and its geophysical methods.
CO 4	Classify and measure the Earthquake prone areas, Landslides and subsidence to practice the hazard zonation.
CO 5	Investigate the project site for mega/mini civil engineering projects and site selection for mega engineering projects like Dams, Reservoirs and Tunnels.

UNIT-I
Introduction: Branches of Geology, Importance of Geology in Civil Engineering with case studies, weathering of rocks, Geological agents, weathering process of Rock, Rivers and geological work of rivers.
UNIT-II
Mineralogy And Petrology: Definitions of mineral and rock-Different methods of study of mineral and rock. Physical properties of minerals and rocks for megascopic study for the following minerals and rocks. Common rock forming minerals: Feldspar, Quartz Group, Olivine, Augite, Hornblende, Mica Group, Asbestos, Talc, Chlorite, Kyanite, Garnet, Calcite and ore forming minerals are Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Chromite, Magnetite and Bauxite. Classification, structures, textures and forms of Igneous rocks, Sedimentary rocks, Metamorphic rocks, and their megascopic study of granite varieties, (pink, gray, green). Pegmatite, Dolerite, Basalt etc., Shale, Sand Stone, Lime Stone, Laterite, Quartzite, Gneiss, Schist, Marble, Khondalite and Slate.
UNIT-III

Structural Geology: Strike , Dip and Outcrop study of common geological structures associating with the rocks such as Folds, Faults, Joints and Unconformities- parts, types, mechanism and their importance in Civil Engineering.
UNIT-IV
Ground Water: Water table, Cone of depression, Geological controls of Ground Water Movement, Ground Water Exploration Techniques. **Earthquakes and Land Slides:** Terminology, Classification, causes and effects, Shield areas and Seismic bells, Richter scale intensity, Precautions of building constructions in seismic areas. Classification of Landslides, Causes and Effects, measures to be taken prevent their occurrence at Landslides. **Geophysics:** Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods and Engineering properties of rocks.
UNIT-V
Geology of Dams, Reservoirs and Tunnels: Types and purpose of Dams, Geological considerations in the selection of a Dam site. Geology consideration for successful constructions of reservoirs, Life of Reservoirs. Purpose of Tunnelling, effects, Lining of Tunnels. Influence of Geology for successful Tunnelling.

Text Books:

1. Engineering Geology by N. ChennaKesavulu, Laxmi Publications . 2ndEdn 2014.
2. Engineering & General Geology by Parbin Singh Katson educational series 8th2023

Reference Books:

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

Web Materials:

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

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

CONCRETE TECHNOLOGY

II B.Tech– II Semester								SJCET-R24
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
24G3A01402T	**PC**	3	0	0	3	30	70	100

Course Objectives:

- Learn materials and their properties used in the production of concrete
- Learn the behavior of concrete at fresh stage
- Learn the behavior of concrete at hardened stage
- Learn the influence of elasticity, creep and shrinkage on concrete
- Learn the mix design methodology and special concretes

Course Outcomes:

CO	Statement
CO 1	Familiarize the basic ingredients of concrete and their role in the production of concrete and its behavior in the field.
CO 2	Test the fresh concrete properties and the hardened concrete properties. Understand the basic concepts of concrete. Design the concrete mix by BIS method.
CO 3	Evaluate the ingredients of concrete through lab test results. realise the importance of quality of concrete
CO 4	Understand the behavior of concrete in various environments.
CO 5	Familiarize the basic concepts of special concrete and their production and applications.

UNIT-I
CEMENTS: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrate cement – Test for physical properties – Different grades of cements – Admixtures – Mineral and chemical admixtures – accelerators, retarders, air entrainers, plasticizers, super plasticizers, fly ash and silica fume **AGGREGATES:** Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand –Deleterious substances – Soundness – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Maximum aggregate size- Quality of mixing water
UNIT-II
FRESH CONCRETE: Steps inManufacture of Concrete–proportion, mixing, placing, compaction, finishing, curing – including various types in each stage. Properties of fresh concrete-Workability – Factors affecting workability – Measurement of workability by different tests, Setting times of concrete, Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete, Ready

mixed concrete, Shotcrete
UNIT-III
HARDENED CONCRETE: Water / Cement ratio – Abram's Law – Gel/space ratio – Nature of strength of concrete –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength – Curing, Testing of Hardened Concrete: Compression test – Tension test – Factors affecting strength – Flexure test –Splitting test – Non-destructive testing methods – Codal provisions for NDT.
UNIT-IV
ELASTICITY, CREEP & SHRINKAGE – Modulus of elasticity – Dynamic modulus of elasticity – Poisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage –types of shrinkage.
UNIT-V
MIX DESIGN AND SPECIAL CONCRETES: Ready mixed concrete, Fibre reinforced concrete – Different types of fibres – Factors affecting properties of FRC, High performance concrete – Self consolidating concrete, Self-healing concrete. Factors in the choice of mix proportions –Quality control of concrete- Statistical methods- Acceptance Criteria-Concepts Proportioning of concrete mixes by ACI method and IS Code method

Text Books:

1. Properties of Concrete by A.M. Neville – PEARSON – 4th edition
2. Concrete Technology by M.L. Gambhir. – Tata Mc.Graw Hill Publishers, New Delhi 5th edition 2013.
3. Concrete Technology by Job Thomas, Cengagae Publications, 1st edition, 2015

Reference Books:

1. Concrete Microstructure, Properties of Materials by P.K. Mehta and Moterio. McGraw Hill 4th edition 2014
2. Concrete Technology, J.J. Brooks and A. M. Neville, Pearson, 2019, 2nd Edition.
3. Concrete Technology by M. S. Shetty. – S. Chand & Co.; 2004
4. Concrete Technology by A.R. Santha Kumar, Oxford University Press, New Delhi

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

STRUCTURAL ANLAYSIS

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01403	PC	3	0	0	3	30	70	100

Course Objectives:

- Learn energy theorems
- Learn the analysis of indeterminate structures
- Analysis of fixed and continuous beams
- Learn about slope-deflection method
- Learn about Moment – distribution method

Course Outcomes:

CO	Statement
CO 1	Apply energy theorems to analyze trusses
CO 2	Analyze indeterminate structures by using Castigliano's–II theorem
CO 3	Analysis of fixed and continuous beams
CO 4	Analyze continuous beams and portal frames by using slope-deflection method
CO 5	Analyze continuous beams and portal frames by using Moment – distribution method

UNIT-I
ENERGY THEOREMS: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces – Castigliano's first theorem Deflections of simple beams and pin jointed trusses.
UNIT-II
ANALYSIS OF INDETERMINATE STRUCTURES: Indeterminate Structural Analysis – Determination of static and kinematic indeterminacies – Solution of trusses with upto two degrees of internal and external indeterminacies – Castigliano's–II theorem.
UNIT-III
FIXED BEAMS & CONTINUOUS BEAMS: Introduction to statically indeterminate beams with uniformly distributed load, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads – Shear force and Bending moment diagrams – Deflection of fixed beams effect of sinking of support, effect of rotation of a support.
UNIT-IV
SLOPE-DEFLECTION METHOD: Introduction-derivation of slope deflection equations-application to continuous beams with and without settlement of supports - Analysis of single bay portal frames without sway.
UNIT-V
MOMENT DISTRIBUTION METHOD: Introduction to moment distribution method-

Application to continuous beams with and without settlement of supports-Analysis of single bay storey portal frames without sway.

Text Books:

1. Analysis of Structures – Vol-I&II by V.N.Vazirani&M.M.Ratwani, Khanna Publications, New Delhi.
2. Basic Structural Analysis by C.S.Reddy., Tata McGraw Hill Publishers. 3rd edition 2017.

Reference Books:

1. Structural analysis by Aslam Kassimali Cengage publications 6th edition 2020.
2. Structural analysis Vol.I and II by Dr.R.Vaidyanathan and Dr.PPerumal– Laxmi publications. 3rd 2016
3. Introduction to structural analysis by B.D.Nautiyal, New Age international publishers, New Delhi.
4. Structural Analysis – D.S.Prakasarao -University press.
5 Strength of Materials and Mechanics of Structures by B.C.Punmia, Khanna Publications, New Delhi.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

HYDRAULICS AND HYRAULIC MACHINERY

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01404	PC	3	0	0	3	30	70	100

Pre-requisite: Fluid Mechanics

Course Objectives:

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

Course Outcomes:

CO	Statement	Blooms level
CO 1	Understand the characteristics of laminar and turbulent flows.	L2
CO 2	Apply the knowledge of fluid mechanics to address the uniform flow problems in open channels.	L3
CO 3	Solve non-uniform flow problems and hydraulic jump phenomenon in open channel flows.	L3
CO 4	Evaluate the performance of impact of jets on plates and design Pelton wheel, Francis and Kaplan turbine	L5
CO 5	Understand the principles, losses and its efficiencies of centrifugal pumps	L2

UNIT-I
Laminar & Turbulent flow in pipes: Laminar Flow- Laminar flow through: circular pipes, annulus and parallel plates. Stoke‘s law, Measurement of viscosity. Reynolds experiment, Transition from laminar to turbulent flow. Resistance to flow of fluid in smooth and rough pipes-Moody‘s diagram – Introduction to boundary layer theory.
UNIT-II
Uniform flow in Open Channels: Open Channel Flow - Comparison between open channel flow and pipe flow, geometrical parameters of a channel, classification of open channels, classification of open channel flow, Velocity Distribution of channel section. Hydraulically efficient channel sections: Rectangular, trapezoidal and triangular channels, Energy and Momentum correction factors
UNIT-III
Non-Uniform flow in Open Channels: Specific energy, critical flow, discharge curve, Specific force, Specific depth, and Critical depth. Measurement of Discharge and Velocity – Gradually Varied Flow- Dynamic Equation of Gradually Varied Flow. Hydraulic Jump and classification - Elements and characteristics- Energy dissipation.
UNIT-IV

Impact of Jets: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes - Velocity triangles at inlet and outlet - Work done and efficiency Hydraulic Turbines: Classification of turbines; pelton wheel and its design. Francis turbine and its design - efficiency - Draft tube: theory - characteristic curves of hydraulic turbines. Cavitation: causes and effects.
UNIT-V
Pumps: Working principles of a centrifugal pump, work done by impeller; heads, losses and efficiencies; minimum starting speed; Priming; specific speed; limitation of suction lift, net positive suction head (NPSH); Performance and characteristic curves; Cavitation effects; Multistage centrifugal pumps; troubles and remedies

Text Books:

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

Reference Books:

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

Online Learning Resources:

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

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

CONCRETE TECHNOLOGY LABORATORY

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01402P	PC	0	0	3	1.5	30	70	100

Course Objectives:

- To test basic properties of ingredients of concrete fresh and hardened concrete properties

Course Outcomes:

CO	Statement
CO 1	Outline importance of testing cement and its properties
CO 2	Assess different properties of Aggregates
CO 3	Assess fresh concrete properties and their relevance to hardened concrete
CO 4	Assess hardened concrete properties

Detailed Syllabus:
1.Tests on Cement Normal Consistency and Fineness of cement. Initial setting time and Final setting time of cement. Specific gravity and soundness of cement. Compressive strength of cement.
2.Tests on Fine Aggregates Grading and fineness modulus of Fine aggregate by sieve analysis. Specific gravity of fine aggregate Water absorption and Bulking of sand.
3.Tests on Coarse Aggregates Grading of Coarse aggregate by sieve analysis. Specific gravity of coarse aggregate Water absorption of Coarse aggregates
4.Tests on fresh Concrete Workability of concrete by compaction factor method Workability of concrete by slump test Workability of concrete by Vee-bee test.
5.Tests on Hardened Concrete Compressive strength of cement concrete and Modulus of rupture Young's Modulus and Poisson's Ratio Split tensile strength of concrete. Non-Destructive testing on concrete (for demonstration)

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING GEOLOGY LABORATORY

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A01401P	PC	0	0	3	1.5	30	70	100

Course Objectives:

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

Course Outcomes:

CO	Statement
CO 1	Identify Megascopic minerals & their properties.
CO 2	Identify Megascopic rocks & their properties.
CO 3	Identify the site parameters such as contour, slope & aspect for topography.
CO 4	Know the occurrence of materials using the strike& dip problems.

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

LAB EXAMINATION PATTERN:

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

5. Bore hole problems.
6. Project report on geology.

References:

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

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DEPARTMENT OF CIVIL ENGINEERING

SOFT SKILLS

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A52403	SEC	0	1	2	2	30	70	100

Course Objectives:

- To encourage all round development of the students by focusing on soft skills
- To make the students aware of critical thinking and problem-solving skills
- To enhance healthy relationship and understanding within and outside an organization
- To function effectively with heterogeneous teams

Course Outcomes:

CO	Statement
CO 1	List out various elements of soft skills (L1, L2)
CO 2	Describe methods for building professional image (L1, L2)
CO 3	Apply critical thinking skills in problem solving (L3)
CO 4	Analyse the needs of an individual and team for well-being (L4)
CO 5	Assess the situation and take necessary decisions (L5)
CO 6	Create a productive workplace atmosphere using social and work-life skills ensuring personal and emotional well-being (L6)

UNIT-I
Soft Skills & Communication Skills: Soft Skills - Introduction, Need - Mastering Techniques of Soft Skills – Communication Skills -Significance, process, types - Barriers of communication - Improving techniques. Activities: Intrapersonal Skills- Narration about self- strengths and weaknesses- clarity of thought – self- expression – articulating with felicity. (The facilitator can guide the participants before the activity citing examples from the lives of the great, anecdotes and literary sources) Interpersonal Skills- Group Discussion – Debate – Team Tasks - Book and film Reviews by groups - Group leader presenting views (non- controversial and secular) on contemporary issues or on a given topic. Verbal Communication- Oral Presentations- Extempore- brief addresses and speeches- convincing- negotiating- agreeing and disagreeing with professional grace. Non-verbal communication – Public speaking – Mock interviews – presentations with an objective to identify non- verbal clues and remedy the lapses on observation.
UNIT-II
Critical Thinking: Active Listening – Observation – Curiosity – Introspection – Analytical Thinking – Open mindedness – Creative Thinking - Positive thinking – Reflection

Activities: Gathering information and statistics on a topic - sequencing – assorting – reasoning – critiquing issues –placing the problem – finding the root cause - seeking viable solution – judging with rationale – evaluating the views of others - Case Study, Story Analysis
UNIT-III
Problem Solving & Decision Making: Meaning & features of Problem Solving – Managing Conflict – Conflict resolution – Team building - Effective decision making in teams – Methods & Styles Activities: Placing a problem which involves conflict of interests, choice and views – formulating the problem – exploring solutions by proper reasoning – Discussion on important professional, career and organizational decisions and initiate debate on the appropriateness of the decision. Case Study & Group Discussion
UNIT-IV
Emotional Intelligence & Stress Management: Managing Emotions – Thinking before Reacting – Empathy for Others – Self-awareness – Self-Regulation – Stress factors – Controlling Stress – Tips Activities: Providing situations for the participants to express emotions such as happiness, enthusiasm, gratitude, sympathy, and confidence, compassion in the form of written or oral presentations. Providing opportunities for the participants to narrate certain crisis and stress –ridden situations caused by failure, anger, jealousy, resentment and frustration in the form of written and oral presentation, Organizing Debates
UNIT-V
Corporate Etiquette: Etiquette- Introduction, concept, significance - Corporate etiquette - meaning, modern etiquette, benefits - Global and local culture sensitivity - Gender Sensitivity - Etiquette in interaction- Cell phone etiquette - Dining etiquette - Netiquette - Job interview etiquette Corporate grooming tips -Overcoming challenges Activities Providing situations to take part in the Role Plays where the students will learn about bad and good manners and etiquette - Group Activities to showcase gender sensitivity, dining etiquette etc. - Conducting mock job interviews - Case Study - Business Etiquette Games

NOTE-:

1. The facilitator can guide the participants before the activity citing examples from the lives of the great, anecdotes, epics, scriptures, autobiographies and literary sources which bear true relevance to the prescribed skill.
2. Case studies may be given wherever feasible for example for Decision Making- The decision of King Lear.

Text Books:

1. Mitra Barun K, Personality Development and Soft Skills, Oxford University Press, Pap/Cdr edition 2012
2. Dr Shikha Kapoor, Personality Development and Soft Skills: Preparing for Tomorrow, I K International Publishing House, 2018

Reference Books:

1. Sharma, Prashant, Soft Skills: Personality Development for Life Success, BPB Publications 2018.
2. Alex K, Soft Skills S.Chand& Co, 2012 (Revised edition)
3. Gajendra Singh Chauhan & Sangeetha Sharma, Soft Skills: An Integrated Approach to Maximise Personality Published by Wiley, 2013
4. Pillai, Sabina & Fernandez Agna, Soft Skills and Employability Skills, Cambridge University Press, 2018
5. Soft Skills for a Big Impact (English, Paperback, Renu Shorey) Publisher: Notion Press
6. Dr. Rajiv Kumar Jain, Dr. Usha Jain, Life Skills (Paperback English) Publisher : Vayu Education of India, 2014

Online Learning Resources:

1. https://youtu.be/DUlsNJtg2L8?list=PLLy_2iUCG87CQhELCytvXh0E_y-bOO1_q
2. https://youtu.be/xBaLgJZ0t6A?list=PLzf4HHlsQFwJZel_j2PUy0pwjVUgj7KlJ
3. https://youtu.be/-Y-R9hDl7lU
4. https://youtu.be/gkLsn4ddmTs
5. https://youtu.be/2bf9K2rRWwo
6. https://youtu.be/FchfE3c2jzc
7. https://www.businesstrainingworks.com/training-resource/five-free-business etiquette-training-games/
8. https://onlinecourses.nptel.ac.in/noc24_hs15/preview
9. https://onlinecourses.nptel.ac.in/noc21_hs76/preview

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

DESIGN THINKING & INNOVATION

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A99401	BS&H	1	0	2	2	30	70	100

Course Objectives:

- The objective of this course is to familiarize students with design thinking process as a tool for breakthrough innovation. It aims to equip students with design thinking skills and ignite the minds to create innovative ideas, develop solutions for real-time problems.

Course Outcomes:

CO	Statement
CO 1	Define the concepts related to design thinking. (L1, L2)
CO 2	Explain the fundamentals of Design Thinking and innovation (L1, L2)
CO 3	Apply the design thinking techniques for solving problems in various sectors. (L3)
CO 4	Analyse to work in a multidisciplinary environment (L4)
CO 5	Evaluate the value of creativity (L5)
CO 6	Formulate specific problem statements of real time issues (L3, L6)

UNIT-I
Introduction to Design Thinking: Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.
UNIT-II
Design Thinking Process: Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development **Activity:** Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.
UNIT-III
Innovation: Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations- Creativity to Innovation- Teams for innovation- Measuring the impact and value of creativity. **Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.
UNIT-IV
Product Design: Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications- Innovation

towards product design- Case studies **Activity:** Importance of modelling, how to set specifications, Explaining their own product design.
UNIT-V
Design Thinking in Business: Processes Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs- Design thinking for Startups- Defining and testing Business Models and Business Cases- Developing & testing prototypes. **Activity:** How to market our own product, About maintenance, Reliability and plan for start up.

Text Books:

1. Tim Brown,Change by design, Harper Bollins (2009)
2. Idris Mootee, Design Thinking for Strategic Innovation, 2013, John Wiley & Sons.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press
2. Shrutin N Shetty, Design the Future, Norton Press
3. William Lidwell,Universal Principles of Design- Kritinaholden, Jill Butter.
4. Chesbrough.H, The Era of Open Innovation – 2013

Online Learning Resources:

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

St.Johns College of Engineering and Technology

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DEPARTMENT OF CIVIL ENGINEERING

COMMUNITY SERVICE PROJECT

.....Experiential learning through community engagement

Introduction

- Community Service Project is an experiential learning strategy that integrates meaningful community service with instruction, participation, learning and community development.
- Community Service Project involves students in community development and service activities and applies the experience to personal and academic development.
- Community Service Project is meant to link the community with the college for mutual benefit. The community will benefit with the focused contribution of the college students for the village/ local development. The college finds an opportunity to develop social sensibility and responsibility among students and emerge as a socially responsible institution.

Objective

Community Service Project should be an integral part of the curriculum, as an alternative to the 2 months of Summer Internships / Apprenticeships / On the Job Training, whenever there is an exigency when students cannot pursue their summer internships. The specific objectives are;

- To sensitize the students to the living conditions of the people who are around them,
- To help students to realize the stark realities of society.
- To bring about an attitudinal change in the students and help them to develop societal consciousness, sensibility, responsibility and accountability
- To make students aware of their inner strength and help them to find new /out of box solutions to social problems.
- To make students socially responsible citizens who are sensitive to the needs of the disadvantaged sections.
- To help students to initiate developmental activities in the community in coordination with public and government authorities.
- To develop a holistic life perspective among the students by making them study culture, traditions, habits, lifestyles, resource utilization, wastages and its management, social problems, public administration system and the roles and responsibilities of different persons across different social systems.

Implementation of Community Service Project

- Every student should put in 6 weeks for the Community Service Project during the summer vacation.
- Each class/section should be assigned with a mentor.
- Specific Departments could concentrate on their major areas of concern. For example, Dept. of Computer Science can take up activities related to Computer Literacy to different sections of people like - youth, women, housewives, etc
- A logbook must be maintained by each of the students, where the activities undertaken/involved to be recorded.
- The logbook has to be countersigned by the concerned mentor/faculty in charge.
- An evaluation to be done based on the active participation of the student and grade could be awarded by the mentor/faculty member.

- The final evaluation to be reflected in the grade memo of the student.
- The Community Service Project should be different from the regular programs of NSS/NCC/Green Corps/Red Ribbon Club, etc.
- Minor project reports should be submitted by each student. An internal Viva shall also be conducted by a committee constituted by the principal of the college.
- Award of marks shall be made as per the guidelines of Internship/apprentice/ on the job training.

Procedure

- A group of students or even a single student could be assigned for a particular habitation or village or municipal ward, as far as possible, in the near vicinity of their place of stay, to enable them to commute from their residence and return back by evening or so.
- The Community Service Project is a twofold one –
    - o First, the student/s could conduct a survey of the habitation, if necessary, in terms of their own domain or subject area. Or it can even be a general survey, incorporating all the different areas. A common survey format could be designed. This should not be viewed as a duplication of work by the Village or Ward volunteers, rather, it could be another primary source of data.
    - o Secondly, the student/s could take up a social activity, concerning their domain or subject area. The different areas, could be like –
        - ♣ Agriculture
        - ♣ Health
        - ♣ Marketing and Cooperation
        - ♣ Animal Husbandry
        - ♣ Horticulture
        - ♣ Fisheries
        - ♣ Sericulture
        - ♣ Revenue and Survey
        - ♣ Natural Disaster Management
        - ♣ Irrigation
        - ♣ Law & Order
        - ♣ Excise and Prohibition
        - ♣ Mines and Geology
        - ♣ Energy
        - ♣ Internet
        - ♣ Free Electricity
        - ♣ Drinking Water

EXPECTED OUTCOMES

BENEFITS OF COMMUNITY SERVICE PROJECT TO STUDENTS

Learning Outcomes

- Positive impact on students' academic learning
- Improves students' ability to apply what they have learned in "the real world"
- Positive impact on academic outcomes such as demonstrated complexity of understanding, problem analysis, problem-solving, critical thinking, and cognitive development.
- Improved ability to understand complexity and ambiguity

Personal Outcomes

- Greater sense of personal efficacy, personal identity, spiritual growth, and moral development
- Greater interpersonal development, particularly the ability to work well with others, and build leadership and communication skills.

Social Outcomes

- Reduced stereotypes and greater inter-cultural understanding
- Improved social responsibility and citizenship skills
- Greater involvement in community service after graduation

Career Development

- Connections with professionals and community members for learning and career opportunities
- Greater academic learning, leadership skills, and personal efficacy can lead to greater opportunity.

Relationship with the Institution

- Stronger relationships with faculty
- Greater satisfaction with college
- Improved graduation rates

BENEFITS OF COMMUNITY SERVICE PROJECT TO FACULTY MEMBERS

- Satisfaction with the quality of student learning
- New avenues for research and publication via new relationships between faculty and community
- Providing networking opportunities with engaged faculty in other disciplines or institutions
- A stronger commitment to one's research.

BENEFITS OF COMMUNITY SERVICE PROJECT TO COLLEGES AND UNIVERSITIES

- Improved institutional commitment.
- Improved student retention
- Enhanced community relations

BENEFITS OF COMMUNITY SERVICE PROJECT TO COMMUNITY

- Satisfaction with student participation
- Valuable human resources needed to achieve community goals.
- New energy, enthusiasm and perspectives applied to community work.
- Enhanced community-university relations.

SUGGESTIVE LIST OF PROGRAMMES UNDER COMMUNITY SERVICE PROJECT

The following the recommended list of projects for Engineering students. The lists are not exhaustive and open for additions, deletions, and modifications. Colleges are expected to focus on specific local issues for this kind of project. The students are expected to carry out these projects with involvement, commitment, responsibility, and accountability. The mentors of a group of students should take the responsibility of

motivating, facilitating, and guiding the students. They have to interact with local leadership and people and appraise the objectives and benefits of this kind of project. The project reports shall be placed in the college website for reference. Systematic, Factual, methodical and honest reporting should be ensured.

For Engineering Students

1. Water facilities and drinking water availability
2. Health and hygiene
3. Stress levels and coping mechanisms
4. Health intervention programmes
5. Horticulture
6. Herbal plants
7. Botanical survey
8. Zoological survey
9. Marine products
10. Aqua culture
11. Inland fisheries
12. Animals and species
13. Nutrition
14. Traditional health care methods
15. Food habits
16. Air pollution
17. Water pollution
18. Plantation
19. Soil protection
20. Renewable energy
21. Plant diseases
22. Yoga awareness and practice
23. Health care awareness programmes and their impact
24. Use of chemicals on fruits and vegetables
25. Organic farming
26. Crop rotation
27. Floury culture
28. Access to safe drinking water
29. Geographical survey
30. Geological survey
31. Sericulture
32. Study of species
33. Food adulteration
34. Incidence of Diabetes and other chronic diseases
35. Human genetics
36. Blood groups and blood levels
37. Internet Usage in Villages
38. Android Phone usage by different people
39. Utilisation of free electricity to farmers and related issues
40. Gender ration in schooling lvel- observation.

Complimenting the community service project the students may be involved to take up some awareness campaigns on social issues/special groups. The suggested list of programs

Programs for School Children

1. Reading Skill Program (Reading Competition)
2. Preparation of Study Materials for the next class.
3. Personality / Leadership Development
4. Career Guidance for X class students
5. Screening Documentary and other educational films
6. Awareness Program on Good Touch and Bad Touch (Sexual abuse)
7. Awareness Program on Socially relevant themes.

Programs for Women Empowerment

1. Government Guidelines and Policy Guidelines
2. Women's Rights
3. Domestic Violence
4. Prevention and Control of Cancer
5. Promotion of Social Entrepreneurship

General Camps

1. General Medical camps
2. Eye Camps
3. Dental Camps
4. Importance of protected drinking water
5. ODF awareness camp
6. Swatch Bharath
7. AIDS awareness camp
8. Anti Plastic Awareness
9. Programs on Environment
10. Health and Hygiene
11. Hand wash programmes
12. Commemoration and Celebration of important days

Programs for Youth Empowerment

1. Leadership
2. Anti-alcoholism and Drug addiction
3. Anti-tobacco
4. Awareness on Competitive Examinations
5. Personality Development

Common Programs

1. Awareness on RTI
2. Health intervention programmes
3. Yoga
4. Tree plantation
5. Programs in consonance with the Govt. Departments like –

    i. Agriculture
    ii. iii. Health Marketing and Cooperation
    iv. Animal Husbandry
    v. Horticulture
    vi. Fisheries
    vii. Sericulture

viii. Revenue and Survey
ix. Natural Disaster Management
x. Irrigation
xi. Law & Order
xii. Excise and Prohibition
xiii. Mines and Geology
xiv. Energy

Role of Students:

- Students may not have the expertise to conduct all the programmes on their own. The students then can play a facilitator role.
- For conducting special camps like Health related, they will be coordinating with the Governmental agencies.
- As and when required the College faculty themselves act as Resource Persons.
- Students can work in close association with Non-Governmental Organizations like Lions Club, Rotary Club, etc or with any NGO actively working in that habitation.
- And also, with the Governmental Departments. If the program is rolled out, the District Administration could be roped in for the successful deployment of the program.
- An in-house training and induction program could be arranged for the faculty and participating students, to expose them to the methodology of Service Learning.

Timeline for the Community Service Project Activity

Duration: 8 weeks

1.Preliminary Survey (One Week)

- A preliminary survey including the socio-economic conditions of the allotted habitation to be conducted.
- A survey form based on the type of habitation to be prepared before visiting the habitation with the help of social sciences faculty. (However, a template could be designed for different habitations, rural/urban.
- The Governmental agencies, like revenue administration, corporation and municipal authorities and village secreteriats could be aligned for the survey.

2.Community Awareness Campaigns (One Week)

- Based on the survey and the specific requirements of the habitation, different awareness campaigns and programmesto be conducted, spread over two weeks of time. The list of activities suggested could be taken into consideration.

3.Community Immersion Programme (Three Weeks)

- Along with the Community Awareness Programmes, the student batch can also work with any one of the below-listed governmental agencies and work in tandem with them. This community involvement programme will involve the students in exposing themselves to experiential learning about the community and its dynamics. Programs could be in consonance with the Govt. Departments.

4.Community Exit Report (One Week)

- During the last week of the Community Service Project, a detailed report of the outcome of the 8 weeks' works to be drafted and a copy shall be submitted to the

local administration. This report will be a basis for the next batch of students visiting that habitation. The same report submitted to the teacher-mentor will be evaluated by the mentor and suitable marks are awarded for onward submission to the University. Throughout the Community Service Project, a daily logbook need to be maintained by the students batch, which should be countersigned by the governmental agency representative and the teacher-mentor, who is required to periodically visit the students and guide them.