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)

Electrical & Electronics Engineering

I & II YEAR COURSE STRUCTURE AND SYLLABUS

St.JohnsCollegeofEngineeringandTechnology
(AUTONOMOUS)
DEPARTMENTOFELECTRICAL & ELECTRONICS ENGINEERING

B.TECH. –ELECTRICAL & ELECTRONICS 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.JohnsCollegeofEngineeringandTechnology

(AUTONOMOUS)

DEPARTMENTOFELECTRICAL & ELECTRONICS ENGINEERING

B.TECH. –I YEAR COURSE STRUCTURE & SYLLABI

B.Tech.–I Year I Semester

S.No.	Course code	Title	L	T	P	Credits
1	24G3A52201T	Communicative English	2	0	0	2
2	24G3A51202T	Chemistry	3	0	0	3
3	24G3A54101	Linear Algebra & Calculus	3	0	0	3
4	24G3A01201T	Basic Civil & Mechanical Engineering	3	0	0	3
5	24G3A05101T	Introduction to Programming	3	0	0	3
6	24G3A52201P	Communicative English Lab	0	0	2	1
7	24G3A51202P	Chemistry Lab	0	0	2	1
8	24G3A03201	Engineering Workshop	0	0	3	1.5
9	24G3A05101P	Computer Programming Lab	0	0	3	1.5
10	24G3A99201	Health and wellness, Yoga and Sports	-	-	1	0.5
Total			**14**	**0**	**11**	**19.5**

B.Tech. I Year II Semester

S.No.	Course code	Title	L	T	P	Credits
1	24G3A56101T	Engineering Physics	2	0	0	2
2	24G3A54201	Differential Equations & Vector Calculus	3	0	0	3
3	24G3A02101T	Basic Electrical & Electronics Engineering	3	0	0	3
4	24G3A03101T	Engineering Graphics	3	0	0	3
5	24G3A05102	IT Workshop	3	0	0	3
6	24G3A02201T	Electrical Circuit Analysis-I	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	24G3A02201P	Electrical Circuit Analysis-I Lab	0	0	3	1.5
10	24G3A99101	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
Total			**13**	**00**	**15**	**20.5**

St.JohnsCollegeofEngineeringandTechnology

(AUTONOMOUS)

DEPARTMENTOFELECTRICAL & ELECTRONICS ENGINEERING

B.Tech. II Year I Semester

S.NO	Subject Code	Title	L	T	P	Credits
1	24G3A54304	Complex Variables & Numerical Methods	3	0	0	3
2	24G3A52301	Universal Human Values-Understanding Harmony	2	1	0	3
3	24G3A02301	Electromagnetic Field Theory	3	0	0	3
4	24G3A02302T	Electrical Circuit Analysis-II	3	0	0	3
5	24G3A02303T	DC Machines & Transformers	3	0	0	3
6	24G3A02302P	Electrical Circuit Analysis-II and Simulation Lab	0	0	3	1.5
7	24G3A02303P	DC Machines & Transformers Lab	0	0	3	1.5
8	24G3A05305	Data Structures	0	1	2	2
9	24G3A99301	Environmental Science	2	0	0	-
		Total	**16**	**2**	**8**	**20**

B.Tech. II Year II Semester

SNO	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	24G3A02401	Analog Circuits	3	0	0	3
3	24G3A02402	Power Systems-I	3	0	0	3
4	24G3A02403T	Induction and Synchronous Machines	3	0	0	3
5	24G3A02404T	Control Systems	3	0	0	3
6	24G3A02403P	Induction and Synchronous Machines Lab	0	0	3	1.5
7	24G3A02404P	Control Systems Lab	0	0	3	1.5
8	24G3A05304	Python Programming	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 ELECTRICAL & ELECTRONICS ENGINEERING

COMMUNICATIVE ENGLISH

I B.Tech– I 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.

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:	Applygrammaticalstructurestoformulatesentencesandcorrectwordforms.
CO3:	Analyzediscoursemarkerstospeakclearlyonaspecifictopicininformaldiscussions.
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: HUMAN VALUES

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: NATURE: The Brook by Alfred Tennyson(Poem

Lesson: NATURE: The Brook by Alfred Tennyson(Poem)

Listening: Answering a series of questions about main ideas and supporting ideas after listening to audiotexts.

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 paragraphtogether.

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: 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: 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 text stocon vey information, reveal trends /patterns/ relationships, communicate processes or display complicated data. **Writing:** Letter Writing: Official Letters, Resumes **Grammar:** Reporting verbs, Direct & Indirect speech, Active & PassiveVoice **Vocabulary:** Words often confused, Jargons
UNIT-V: 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/learning english
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 ELECTRICAL & ELECTRONICS ENGINEERING

CHEMISTRY

(Common to EEE, ECE, CSE, IT) & allied branches)

I B.Tech – I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A51202T	BS&H	3	0	0	3	30	70	100

Course Objectives:

- To familiarize engineering chemistry and itsapplications
- To train the students on the principles and applications of electro chemistry andpolymers
- To introduce instrumental methods, molecular machines andswitches.

Course Outcomes: At the end of the course, the students will be able to:	
CO1:	Compare the materials of construction for battery and electro chemical sensors.
CO2:	Explain the preparation, properties, and applications of thermoplastics & thermosetting & elastomers conducting polymers.
CO3:	Explain the principles of spectrometry, slcin separation of solid and liquid mixtures.
CO4:	ApplytheprincipleofBanddiagramsintheapplicationofconductorsandsemiconductors.
CO5:	Summarize the concepts of Instrumental methods.

UNIT-I: Structure and Bonding Models:
Fundamentals of Quantum mechanics, Schrodinger Wave equation, significance of Ψ and Ψ2, particle in one dimensional box, molecular orbital theory – bonding in homo- and heteronuclear diatomic molecules– energy level diagrams of O2 and CO, etc. π-molecular orbital's of butadiene and benzene, calculation of bond order.
UNIT-II: Modern Engineering materials
Semiconductors – Introduction, basic concept, application Super conductors-Introduction basic concept, applications. Super capacitors: Introduction, Basic Concept-Classification – Applications. Nano materials: Introduction, classification, properties and applications of Fullerenes, carbon nano tubes and Graphines nanoparticles.
UNIT-III: Electrochemistry and Applications
Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, potentiometry- potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conduct metric titrations (acid-base titrations). Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples. Primary cells – Zinc-air battery, Secondary cells –lithium-ion batteries- working of the batteries including cell reactions; Fuel cells, hydrogen-oxygenfuel cell– working of the cells. Polymer Electrolyte Membrane Fuel cells (PEMFC).
UNIT-IV: Polymer Chemistry
Introduction to polymers, functionality of monomers, chain growth and step growth polymerization, coordination polymerization, with specific examples and mechanisms of polymer formation.

Plastics –Thermo and Thermosetting plastics, Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres. Elastomers–Buna-S, Buna-N–preparation, properties and applications. Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications. Bio- Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA).
UNIT-V: Instrumental Methods and Applications
Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. UV-Visible Spectroscopy, electronic transition, Instrumentation, IR spectres copies, fundamental modes and selection rules, Instrumentation. Chromatography-Basic Principle, Classification-HPLC: Principle, Instrumentation and Applications.

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e,DhanpatRai,2013.
2. Peter Atkins, Juliode Paula and JamesKeeler, Atkins' Physical Chemistry,10/e, Oxford University Press, 2010.

Reference Books:

1. Skoog and West, Principles of Instrumental Analysis,6/e,Thomson,2007.
2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008
3. Textbook of Polymer Science, Fred W. Billmayer Jr, 3rd Edition

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LINEAR ALGEBRA & CALCULUS

(Common to All Branches of Engineering)

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

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 amatrixby 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, MicheaelGreenberg,, 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 ELECTRICAL & ELECTRONICS ENGINEERING

BASICS OF CIVIL AND MECHANICAL 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
24G3A01201T	ES	3	0	0	3	30	70	100

PART A: BASICS OF CIVIL ENGINEERING

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 toBearings 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 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

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.JyothishKumar,Pulak M Pandey,Springerpublications

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 ELECTRICAL & ELECTRONICS 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
24G3A05101	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 Out comes: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, dowhile) 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 ELECTRICAL & ELECTRONICS ENGINEERING

COMMUNICATIVE ENGLISH 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**
24G3A52201P	**BS&H**	0	0	2	1	30	70	100

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.*ACourseinPhoneticsandSpokenEnglish*,(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 ELECTRICAL & ELECTRONICS ENGINEERING

CHEMISTRY LAB

(Common to EEE, ECE, CSE, IT & allied branches)

I B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A51202P	BS&H	0	0	2	1	30	70	100

Course Outcomes:

At the end of the course, the students will be able to

CO1:	Determine the cell constant and conduct a nceofsolutions
CO2:	Prepare advanced polymer Bakelite materials.
CO3:	Measure the strength of an acid present in secondary batteries.
CO4:	Analyse the IR spectra of some organic compounds.
CO5:	Calculate strength of acid in Pb-Acid battery.

List of Topics:

1. Measurement of 10Dq by spectro photo metric method
2. Conduct metric titration of strong acid vs. strong base
3. Conduct metric titration of weak acid vs. strong base
4. Determination of cell constant and conductance of solutions
5. Potentiometer - determination of redox potentials and emfs
6. Determination of Strength of an acid in Pb-Acid battery
7. Preparation of a Bakelite
8. Verify Lambert-Beer's law
9. Wavelength measurement of sample through UV-Visible Spectroscopy
10. Identification of simple organic compounds by IR
11. Preparation of nanomaterials by precipitation method
12. Estimation of Ferrous Iron by Dichrometry

Reference:

•"Vogel's Quantitative Chemical Analysis 6th Edition 6th Edition" Pearson Publications by J. Mendham, R.C.Denney, J.D.Barnes and B. Sivasankar

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS 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– I Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
24G3A03201	ES	0	0	3	1.5	30	70	100

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. ACoursein Workshop TechnologyVolI. &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

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COMPUTER PROGRAMMING LAB

(Common to All branches of Engineering)

I B.Tech– I Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		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.

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

UNIT III

WEEK 7:

Objective: Explore the full scope of Arrays construct namely defining and initializing 1-Dand2-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

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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 ELECTRICAL & ELECTRONICS ENGINEERING

HEALTH AND WELLNESS, YOGA AND SPORTS

(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
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

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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

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ENGINEERING PHYSICS

(Common for all branches of Engineering)

I B.Tech– I Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
24G3A05102	BS&H	0	0	3	1.5	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).

ReferenceBooks:

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

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

(Common to All Branches of Engineering)

I B.Tech– II Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
24G3A54201	BS&H	3	0	0	3	30	70	100

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

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DEPARTMENT OF ELECTRICAL & ELECTRONICS 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
24G3A02101	ES	3	0	0	3	30	70	100

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 andI. J. Nagrath,Mc Graw Hill, 2019,Fourth Edition
2.PrinciplesofPowerSystems,V.K.Mehtha,S.ChandTechnicalPublishers,2020
3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017
4. BasicElectricalandElectronicsEngineering,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

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DEPARTMENT OF ELECTRICAL & ELECTRONICS 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&LouisNashlesky,ElectronicDevices&CircuitTheory,Pearson Education, 2021.
2. R.P.Jain,ModernDigitalElectronics,4thEdition,TataMcGrawHill,2009

Reference Books:

1. R.S.Sedha,A Textbook of Electronic Devices and Circuits,S.Chand&Co,2010.
2. SantiramKal,BasicElectronics-Devices,CircuitsandITFundamentals,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 ELECTRICAL & ELECTRONICS ENGINEERING

ENGINEERING GRAPHICS

(Common to all branches of Engineering)

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

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

I B.Tech– II 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 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 infront, and topviews.
CO3:	Understand and draw projection of planes and solids in various positions in first quadrant.
CO4:	Explain principles of sections of solids
CO5:	Prepare isometric and development of simple solids.

UNIT-I:IntroductiontoEngineeringDrawing:
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.LNarayana,P.Kannaiah,ScitechPublications,2011
2. Engineering Drawing by N.D.Bhatt, ChariotPublications,2014

Reference Books:

1. K. Venugopal,Engineering Drawing and Graphics with Auto CAD,FourthEdition,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 ELECTRICAL & ELECTRONICS ENGINEERING

IT WORKSHOP

(Common to all branches of Engineering)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
24G3A05102	ES	L	T	P	C	CIA	SEE	Total
		0	0	3	1.5	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 ELECTRICAL & ELECTRONICS ENGINEERING

ELECTRICAL CIRCUIT ANALYSIS -I

(EEE & allied branches)

I B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02201T	ES	3	0	0	3	30	70	100

Course Objectives:

To develop an understanding of the fundamental laws, elements of electrical circuits and to apply circuit analysis to DC and AC circuits.

Course Outcomes:	
CO1:	Remembering the basic electrical elements and different fundamental laws.
CO2:	Understand the network reduction techniques, transformations, concept of self-inductance and mutual inductance, phasor diagrams, resonance and network theorems.
CO3:	Apply the concepts to obtain various mathematical and graphical representations
CO4:	Analyse nodal and mesh networks, series and parallel circuits, steady state response, different circuit topologies (with R, L and C components).
CO5:	Evaluation of Network theorems, electrical, magnetic and single-phase circuits.

UNIT-I:INTRODUCTION TO ELECTRICAL CIRCUITS
Basic Concepts of passive elements of R, L, C and their V-I relations, Sources (dependent and independent), Kirchoff's laws, Network reduction techniques (series, parallel, series - parallel, star-to- delta and delta-to-star transformation), source transformation technique, nodal analysis and mesh analysis to DC networks with dependent and independent voltage and current sources, node and mesh analysis.
UNIT-II: MAGNETIC CIRCUITS
Basic definition of MMF, flux and reluctance, analogy between electrical and magnetic circuits, Faraday's laws of electromagnetic induction – concept of self and mutual inductance, Dot convention – coefficient of coupling and composite magnetic circuit, analysis of series and parallel magnetic circuits.
UNIT-III: SINGLE PHASE CIRCUITS
Characteristics of periodic functions, Average value, R.M.S. value, form factor, representation of a sine function, concept of phasor, phasor diagrams, node and mesh analysis. Steady state analysis of R, L and C circuits to sinusoidal excitations-response of pure resistance, inductance, capacitance, series RL circuit, series RC circuit, series RLC circuit, parallel RL circuit, parallel RC circuit.
UNIT-IV: RESONANCE AND LOCUS DIAGRAMS
Series Resonance: Characteristics of a series resonant circuit, Q-factor, selectivity and bandwidth, expression for half power frequencies; Parallel resonance: Q-factor, selectivity and bandwidth; Locus diagram: RL, RC, RLC with R, L and C variables
UNIT-V:NETWORK THEOREMS (DC & AC EXCITATIONS)
Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Reciprocity theorem, Millman's theorem and compensation theorem

Textbooks:

1.Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata Mc Graw Hill Education, 2005, sixthedition.

2.Network Analysis, M. E. Van Valkenburg, Pearson Education, 2019, Revised Third Edition

Reference Books:

1.Fundamentals of Electrical Circuits, Charles K. Alexander and Mathew N.O. Sadiku Mc Graw Hill Education (India), 2013, Fifth Edition

2.Electric Circuits (Schaum's outline Series), Mahmood Nahvi, Joseph Edminister, and K. Rao, Mc Graw Hill Education, 2017, Fifth Edition.

3.Electric Circuits, David A. Bell, Oxford University Press, 2009, Seventh Edition.

4.Introductory Circuit Analysis, Robert L Boylestad, Pearson Publications, 2023, Fourteenth Edition.

5.Circuit Theory: Analysis and Synthesis, A. Chakrabarti, Dhanpat Rai & Co., 2018, Seventh Revised Edition.

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc23_ee81/preview
2. https://nptel.ac.in/courses/108104139
3. https://nptel.ac.in/courses/108106172
4. https://nptel.ac.in/courses/117106108

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ENGINEERING PHYSICS LAB

I B.Tech– II Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		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.	

References:

- A Textbook of Practical Physics - S. Balasubramanian, M.N. Srinivasan, 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 ELECTRICAL & ELECTRONICS ENGINEERING

ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP

(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
24G3A02101P	ES	0	0	3	1.5	30	70	100

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 ableto

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.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ELECTRICAL CIRCUIT ANALYSIS –I LAB

(EEE & allied branches)

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

Course Objectives:

To impart hands on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of circuit characteristics. It also gives practical exposure to the usage of different circuits with different conditions.

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the concepts of network theorems, node and mesh networks, series and parallel resonance and Locus diagrams.
CO2:	Apply various theorems to compare practical results obtained with theoretical calculations
CO3:	Determine self, mutual inductances and coefficient of coupling values, parameters of choke coil.
CO4:	Analyse different circuit characteristics with the help of fundamental laws and various configurations.
CO5:	Create locus diagrams of RL, RC series circuits and examine series and parallel resonance.

List of Experiments

S.No.	Title of the Experiment
1	Verification of Kirchhoff's circuit laws.
2	Verification of node and mesh analysis.
3	Verification of network reduction techniques.
4	Determination of cold and hot resistance of an electric lamp
5	Determination of Parameters of a choke coil
6	Determination of self, mutual inductances, and coefficient of coupling
7	Series and parallel resonance
8	Locus diagrams of R-L (L Variable) and R-C (C Variable) series circuits
9	Verification of Superposition theorem
10	Verification of Thevenin's and Norton's Theorems
11	Verification of Maximum power transfer theorem.
12	Verification of Compensation theorem.
13	Verification of Reciprocity and Millman's Theorems
Note: Any 10 from the above experiments, out of which two may be conducted through virtual labs.	

Reference Books:

1. Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata Mc Graw Hill Education, 2005,sixthedition.
2. Network Analysis, M. E. Van Valkenburg, Pearson Education, 2019, Revised ThirdEdition

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE

(Common to All branches of Engineering)

I B.Tech– II Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		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 ELECTRICAL & ELECTRONICS ENGINEERING

COMPLEX VARIABLES AND NUMERICAL METHODS

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A54304	BS&H	3	0	0	3	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Analyze limit, continuity and differentiation of functions of complex variables and 3. Understand Cauchy-Riemann equations, analytic functions and various properties of analytic functions.
CO2:	Understand Cauchy theorem, Cauchy integral formulas and apply these to evaluate complex contour integrals. Classify singularities and poles; find residues and evaluate complex integrals using the residue theorem.
CO3:	Apply numerical methods to solve algebraic and transcendental equations
CO4:	Derive interpolating polynomials using interpolation formulae.
CO5:	Solve differential and integral equations numerically.

UNIT-I: Complex Variable – Differentiation
Introduction to functions of complex variable-concept of Limit & continuity-Differentiation, Cauchy-Riemann equations, analytic functions harmonic functions, finding harmonic conjugate-construction of analytic function by Milne Thomson method.
UNIT-II: Complex Variable – Integration
Line integral-Contour integration, Cauchy's integral theorem(Simple Case), Cauchy Integral formula, Power series expansions: Taylor's series, zeros of analytic functions, singularities, Laurent's series, Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral involving sine and cosine.
UNIT-III: 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-IV: 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-V: 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).

Textbooks:

1.B.S.Grewal, Higher Engineering Mathematics, KhannaPublishers,2017, 44th Edition
2.S S Sastry, Introductory Methods of Numerical Analysis, PHI Learning Private Limited.

Reference Books:

1.Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 2018, 10th Edition.
2.B.V.Ramana, Higher Engineering Mathematics, by Mc Graw Hill publishers
3.R.K.Jain and S.R.K.Iyengar, Advanced Engineering Mathematics, Alpha Science International Ltd.,2021 5th Edition(9th reprint).

Online Learning Resources:

1.https://onlinecourses.nptel.ac.in/noc17_ma14/preview
2.https://onlinecourses.nptel.ac.in/noc20_ma50/preview
3.http://nptel.ac.in/courses/111105090

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

UNIVERSAL HUMAN VALUES – UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
24G3A52301	BS&H	L	T	P	C	CIA	SEE	Total
		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: At the end of the course, the students will be able to:

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

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
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
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 Lecture16: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
UNIT-V: Instrumental Methods and Applications
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

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

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

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ELECTROMAGNETIC FIELD THEORY

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02301	ES	3	0	0	3	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Remember the concepts of vector algebra, vector calculus, various undamental laws, self and mutual inductance
CO2:	Understand the concepts of electrostatics, conductors, dielectrics, capacitance, magneto statics, magnetic fields, time varying fields, self and mutual inductances
CO3:	Apply vector calculus, Coulomb's law, Gauss's law, Ohm's law in point form, Biot-Savart's law, Ampere's circuital law, Maxwell's third equation, self and mutual inductances, Faraday's laws, Maxwell's fourth equation, Poynting theorem to solve various numerical problems
CO4:	Analyze vector calculus, electrostatic fields, behavior of conductor in electricfiled, Biot-Savart's law and its applications
CO5:	Analyze magnetic force, moving charges in a magnetic field, self-inductance of different cables, mutual inductance between different wires and time varying fields.

UNIT-I: Vector Analysis:

Vector Algebra: Scalars and Vectors, Unit vector, Vector addition and subtraction, Position and distance vectors, Vector multiplication, Components of a vector.

Coordinate Systems: Rectangular, Cylindrical and Spherical coordinate systems.

Vector Calculus: Differential length, Area and Volume.Del operator, Gradient of a scalar, Divergence of a vector and Divergence theorem (definition only). Curl of a vector and Stoke's theorem (definition only), Laplacian of a scalar

Electrostatics:

Coulomb's law and Electric field intensity (EFI) – EFI due to Continuous charge distributions (line and surface charge), Electric flux density, Gauss's law (Maxwell's first equation,

$\nabla . \vec{D} = \rho$), Applications of Gauss's law, Electric Potential, Work done in moving a point charge in an electrostatic field (second Maxwell's equation for static electric fields,$\nabla \times \vec{E} = 0$), Potential gradient, Laplace's and Poison's equations.

UNIT-II: Conductors – Dielectrics and Capacitance:

Behaviour of conductor in Electric field, Electric dipole and dipole moment – Potential and EFI due to an electric dipole, Torque on an Electric dipole placed in an electric field, Current density-conduction and convection current densities, Ohm's law in point form, Behaviour of conductors in an electric field, Polarization, dielectric constant and strength, Continuity equation and relaxation time, Boundary conditions between conductor to dielectric, dielectric to dielectric and conductor to free space, Capacitance of parallel plate, coaxial and spherical capacitors, Energy stored and density in a static electric field, Coupled and decoupled capacitors

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

UNIT-III: Magneto statics, Ampere's Law and Force in magnetic fields:
Biot-Savart's law and its applications viz. Straight current carrying filament, circular, square, rectangle and solenoid current carrying wire – Magnetic flux density and Maxwell's second Equation ($\nabla . \vec{B} = 0$), Ampere's circuital law and its applications viz. MFI due to an infinite sheet, long filament, solenoid, toroidal current carrying conductor, point form of Ampere's circuital law, Maxwell's third equation ($\nabla \times \vec{H} = J$). Magnetic force, moving charges in a magnetic field – Lorentz force equation, force on a current element in a magnetic field, force on a straight and a long current carrying conductor in a magnetic field, force between two straight long and parallel current carrying conductors, Magnetic dipole, Magnetic torque, and moment.
UNIT-IV: Self and mutual inductance:
Self and mutual inductance – determination of self-inductance of a solenoid, toroid, coaxial cable and mutual inductance between a straight long wire and a square loop wire in the same plane – Energy stored and energy density in a magnetic field
UNIT-V: Time Varying Fields:
Faraday's laws of electromagnetic induction, Maxwell's fourth equation($\nabla \times \vec{E} = -\partial \vec{B}$),∂tintegral and point forms of Maxwell's equations, statically and dynamically induced EMF, Displacement current, Modification of Maxwell's equations for time varying fields, Poynting theorem and Poynting vector

Textbooks:

1."Elements of Electromagnetics" by Matthew N O Sadiku, Oxford Publications, 7th edition, 2018.
2."Engineering Electromagnetics" by William H. Hayt& John. A. Buck Mc. Graw-Hill, 7th Editon.2006.

Reference Books:

1."Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition.
2."Electromagnetic Field Theory" by Yaduvir Singh, Pearson India, 1st edition, 2011.
3."Fundamentals of Engineering Electromagnetics" by Sunil Bhooshan, Oxford University Press, 2012.
4.Schaum's Outline of Electromagneticsby Joseph A. Edminister, MahamoodNavi, 4th Edition,2014.

Web Resources:

1.https://archive.nptel.ac.in/courses/108/106/108106073/
2.https://nptel.ac.in/courses/117103065

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ELECTRICAL CIRCUIT ANALYSIS-II

II B.Tech– I Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
24G3A02302T	PC	3	0	0	3	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Remember the concepts of Laplace transforms, formulation of various circuit topologies (R, L and C components) and basic filters
CO2:	Understand three phase balanced and unbalanced circuits, different circuit configurations and it's mathematical modeling, network parameters and various filters
CO3:	Apply Laplace transforms to solve various electrical network topologies and filter design concepts
CO4:	Analyze three phase circuits, transient response of various network topologies, electric circuits with periodic excitations and filter characteristics
CO5:	Design suitable electrical circuits and various filters for different applications

UNIT-I

Analysis of three phase balanced circuits:

Phase sequence, star and delta connection of sources and loads, relation between line and phase quantities, analysis of balanced three phase circuits, measurement of active and reactive power.

Analysis of three phase unbalanced circuits:

Loop method, Star-Delta transformation technique, two-wattmeter method for measurement of three phase power..

UNIT-II

Laplace transforms – Definition and Laplace transforms of standard functions– Shifting theorem – Transforms of derivatives and integrals,Inverse Laplace transforms and applications.

Transient Analysis: Transient response of R-L, R-C and R-L-C circuits (Series and parallel combinations) for D.C. and sinusoidal excitations – Initial conditions - Solution using differential equation approach and Laplace transform approach.

UNIT-III

Network Parameters: Impedance parameters, Admittance parameters, Hybrid parameters, Transmission (ABCD) parameters, conversion of Parameters from one form to other, Conditions for Reciprocity and Symmetry, Interconnection of Two Port networks in Series, Parallel and Cascaded configurations- problems.

UNIT-IV:

Analysis of Electric Circuits with Periodic Excitation: Fourier series and evaluation of Fourier coefficients, Trigonometric and complex Fourier series for periodic waveforms, Application to Electrical Systems – Effective value and average value of non-sinusoidal periodic waveforms, power factor, effect of harmonics

UNIT-V:
Filters: Classification of filters-Low pass, High pass, Band pass and Band Elimination filters, Constant-k filters -Low pass and High Pass, Design of Filters.

Textbooks:

1. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 8th Edition McGraw-Hill, 2013
2. Fundamentals of Electric Circuits, Charles K. Alexander, Mathew N. O. Sadiku, 3rd
Edition, Tata McGraw-Hill, 2019

Reference Books:

1. Network Analysis, M. E. Van Valkenburg, 3rd Edition, PHI, 2019.
2. Network Theory, N. C. Jagan and C. Lakshminarayana, 1st Edition, B. S. Publications, 2012.
3. Circuits and Networks Analysis and Synthesis, A. Sudhakar, Shyam Mohan S. Palli, 5th Edition, Tata McGraw-Hill, 2017.
4. Engineering Network Analysis and Filter Design (Including Synthesis of One Port Networks)- Durgesh C. KulshreshthaGopal G. Bhise, Prem R. Chadha ,Umesh Publications 2012.
5. Circuit Theory: Analysis and Synthesis, A. Chakrabarti, DhanpatRai& Co., 2018, 7th
Revised Edition.

Web Resources:

1. https://archive.nptel.ac.in/courses/117/106/117106108/
2. https://archive.nptel.ac.in/courses/108/105/108105159/

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

DC MACHINES & TRANSFORMERS

II B.Tech– I Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
24G3A02303T	PC	3	0	0	3	30	70	100

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

CO1:	Understand the process of voltage build-up in DC generators and characteristics.
CO2:	Understand the process of torque production, starting and speed control of DC motors and illustrate their characteristics
CO3:	Obtain the equivalent circuit of single-phase transformer, auto transformer and determine its efficiency & regulation
CO4:	Apply various testing methods for transformers and speed control of DC motors
CO5:	Analyze various configurations of three-phase transformers

UNIT-1: DC Generators:
Construction and principle of operation of DC machines – EMF equation for generator Excitation techniques– characteristics of DC generators –applications of DC Generators, Back-emf and torque equations of DC motor – Armature reaction and commutation, Applications.
UNIT-1I: Starting, Speed Control and Testing of DC Machines:
Characteristicsof DC motors – losses andefficiency – applications of DC motors. Necessity of a starter – starting by 3-point and 4-point starters – speed control by armature voltage and field current control – testing of DC machines – brake test, Swinburne's test –Hopkinson's test–Field Test.
UNIT-III: Single-phase Transformers:
Introduction to single-phase Transformers (Construction and principle of operation)– emf equation – operation on no-load and on load –lagging, leading and unity power factors loads–phasor diagrams– equivalent circuit –regulation – losses and efficiency – effect of variation of frequency and supply voltage on losses – all day efficiency, Applications.
UNIT-1V: Testing of Transformers:
Open Circuit and Short Circuit tests – Sumpner's test – separation of losses— Parallel operation with equal and unequal voltage ratios– auto transformer – equivalent circuit – comparison with two winding transformers
UNIT-V: Three-Phase Transformers:
Polyphase connections- Y/Y, Y/Δ, Δ/Y, Δ/Δ, open Δ and Vector groups – third harmonics in phase voltages– Parallel operation–three winding transformers-transients in switching –off load and on load tap changers–Scott connection.

Textbooks:

1. Electrical Machinery by Dr. P S Bimbhra, 7th edition, Khanna Publishers, New Delhi,1995.
2. Performance and analysis of AC machines by M.G. Say, CBS, 2002.

Reference Books:

1. Electrical Machines by D. P.Kothari, I .J .Nagarth, McGraw Hill Publications, 5th edition
2. Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill education 2011.
3. Generalized Theory of Electrical Machines by Dr. P S Bimbhra, 7th Edition, Khanna Publishers, 2021.
4. Theory & Performance of Electrical Machines by J.B.Gupta, S.K.Kataria& Sons,2007.
5. Electric Machinery by Fitzgerald, A.E.,Kingsley, Jr.,C.,&Umans, S. D, 7th edition, McGraw-Hill Education, 2014.

Web Resources:

1. nptel.ac.in/courses/108/105/108105112
2. nptel.ac.in/courses/108/105/108105155

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ELECTRICAL CIRCUIT ANALYSIS-II AND SIMULATION LAB

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02302P	PC	0	0	3	1.5	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the power calculations in three phase circuits.
CO2:	Analyze the time response of given network.
CO3:	Determination of two port network parameters.
CO4:	Simulate and analyze electrical circuits using software tools
CO5:	Apply various theorems to solve different electrical networks using simulation tools

List of Experiments

S.No.	Title of the Experiment
1	Measurement of Active Power and Reactive Power for balanced loads
2	Measurement of Active Power and Reactive Power for unbalanced loads.
3	Determination of Z and Y parameters
4	Determination of ABCD and hybrid parameters
5	Verification of Kirchhoff's current law and voltage law using simulation tools.
6	Verification of mesh and nodal analysis using simulation tools.
7	Verification of super position and maximum power transfer theorems using simulation tools.
8	Verification of Reciprocity and Compensation theorems using simulation tools.
9	Verification of Thevenin's and Norton's theorems using simulation tools.
10	Verification of series and parallel resonance using simulation tools.
11	Simulation and analysis of transient response of RL, RC and RLC circuits.
12	Verification of self-inductance and mutual inductance by using simulation tools.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

DC MACHINES & TRANSFORMERS LAB

II B.Tech– I Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02303P	PC	0	0	3	1.5	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Demonstrate starting and speed control methods of DC Machines..
CO2:	Apply theoretical concepts to determine the performance characteristics of DC Machines.
CO3:	Analyze the parallel operation of single phase transformers.
CO4:	Determine the performance parameters of single-phase transformer.
CO5:	Analyze the performance analysis of transformers using various tests

List of Experiments

S.No.	Title of the Experiment
1	Speed control of DC shunt motor by Field Current and Armature Voltage Control.
2	Brake test on DC shunt motor- Determination of performance curves.
3	Swinburne's test - Predetermination of efficiencies as DC Generator and Motor.
4	Hopkinson's teston DC shunt Machines.
5	Load test on DC compound generator-Determination of characteristics.
6	Load test on DC shunt generator-Determination of characteristics.
7	Fields test on DC series machines-Determination of efficiency.
8	Brake test on DC compound motor-Determination of performance curves
9	OC & SC tests on single phase transformer.
10	Sumpner's test on single phase transformer.
11	Scott connection of transformers
12	Parallel operation of Single-phase Transformers.
13	Separation of core losses of a single-phase transformer.Measurement of Active Power and Reactive Power for balanced loads

Reference:

1. https://ems-iitr.vlabs.ac.in/List%20of%20experiments.html

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

DATA STRUCTURES

(Skill Enhancement Course)

II B.Tech– I Semester								SJCET-R24
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
24G3A05305	**ES**	0	1	2	2	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the role of data structures in organizing and accessing data
CO2:	Design, implement and apply linked lists for dynamic data storage
CO3:	Develop applications using stacks and queues
CO4:	Design and implement algorithms for operations on binary trees and binary search trees
CO5:	Design novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees

UNIT-I:

Introduction to Data Structures: Definition and importance of Data structures, Abstract data types (ADTs) and its specifications, Arrays: Introduction, 1-D, 2-D Arrays, accessing elements of array, Row Major and Column Major storage of Arrays, Searching Techniques: Linear & Binary Search, Sorting Techniques: Bubble sort, Selection sort, Quick sort.

Sample experiments:

1. Program to find min & max element in an array.
2. Program to implement matrix multiplication.
3. Find an element in given list of sorted elements in an array using Binary search.
4. Implement Selection and Quick sort techniques.

UNIT-II:

Linked Lists: Singly linked lists: representation and operations, doubly linked lists and circular linked lists, Comparing arrays and linked lists, Applications of linked lists.

Sample experiments:

1. Write a program to implement the following operations.
   a. Insert b. Deletion c. Traversal
2. Write a program to store name, roll no, and marks of students in a class using circular double linked list.
3. Write a program to perform addition of given two polynomial expressions using linked list.

UNIT-III:

Stacks: Introduction to stacks: properties and operations, implementing stacks using arrays and linked lists, Applications of stacks in expression evaluation, backtracking, reversing list etc.

Sample experiments:

1. Implement stack operations using
   a. Arrays b. Linked list
2. Convert given infix expression into post fix expression using stacks.
3. Evaluate given post fix expression using stack.
4. Write a program to reverse given linked list using stack.

UNIT-IV:
Queues: Introduction to queues: properties and operations, Circular queues, implementing queues using arrays and linked lists,Applications of queues scheduling, etc. Deques: Introduction to deques (double-ended queues), Operations on deques and their applications **Sample experiments:** 1. Implement Queue operations using a.Arrays b. Linked list 2. Implement Circular Queue using a.Arrays b. Linked list 3. Implement Dequeue using linked list.
UNIT-V:
Trees: Introduction to Trees, Binary trees and traversals, Binary Search Tree – Insertion, Deletion & Traversal **Sample experiments:** 1. Implement binary tree traversals using linked list. 2. Write program to create binary search tree for given list of integers. Perform in-order traversal of the tree. Implement insertion and deletion operations.

Textbooks:

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
2. Fundamentals of data structures in C, Ellis Horowitz, SartajSahni, Susan Anderson- Freed, Silicon Press, 2008

Reference Books:

1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
3. Problem Solving with Algorithms and Data Structures by Brad Miller and David Ranum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
5. Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS 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	0	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-1:

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 sit Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc..

Textbooks:

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.

References:

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.

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS 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:

After the completion of the course students will be able to

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

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.

Textbooks:

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

Reference Books:

1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, 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

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS 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: After the completion of the course students will be able to

CO1:	Define the Organizational Behaviour, its nature and scope.
CO2:	Understand the nature and concept of Organizational behaviour
CO3:	Apply theories of motivation to analyse the performance problems
CO4:	Analyse the different theories of leadership
CO5:	Evaluate group dynamics
CO6:	Develop as powerful leader

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

Textbooks:

1. Luthans, Fred, Organisational 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.

O**nline 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 ELECTRICAL & ELECTRONICS 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: After the completion of the course students will be able to

CO1:	Define Business Environment and its Importance.
CO2:	Understand various types of business environment.
CO3:	Apply the knowledge of Money markets in future investment
CO4:	Analyse India's Trade Policy
CO5:	Evaluate fiscal and monitory policy
CO6:	Develop a personal synthesis and approach for identifying business opportunities

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.

Textbooks:

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 ELECTRICAL & ELECTRONICS ENGINEERING

ANALOG CIRCUITS

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02401	ES	3	0	0	3	30	70	100

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

CO1:	Understand the concepts of diode clipping and clamping circuits, different amplifier configurations, operation of oscillator circuits operational amplifiers, timers, ADC and DAC
CO2:	Apply the above concepts for different circuit design.
CO3:	Analyze various circuit characteristics by using Amplifiers, Transistors, Comparators, Wave form generators, ADC and DAC
CO4:	Analyze various circuit characteristics by using timers, Phase locked loops and operational amplifiers
CO5:	Evaluate fiscal and monitory policy
CO6:	Evaluate different system configurations by using various amplifier, transistor and waveform generators

UNIT-I:

Diode clipping and clamping circuits: Diode clippers, clipping at two independent levels, Transfer characteristics of clippers, clamping circuit operation.

DC biasing of BJTs: Load lines, Operating Point, Bias Stability, Collector-to-Base Bias, Self-Bias, Stabilization against Variations in VBE and β for the Self-Bias Circuit, Bias Compensation, Thermal Runaway, Thermal Stability.

UNIT-II:

Small Signals Modeling of BJT: Analysis of a Transistor Amplifier Circuit using h-parameters, Simplified CE Hybrid Model, Analysis of CE, CC, CB Configuration using Approximate Model, Frequency Response of CE and CC amplifiers.

Feedback Amplifiers: Classification of Amplifiers, the Feedback Concept, General Characteristics of Negative-Feedback Amplifiers, Effect of Negative Feedback upon Output and Input Resistances, Voltage-Series Feedback, Current-Series Feedback, Current-Shunt Feedback, Voltage-Shunt Feedback.

UNIT-III:

Oscillator Circuits: Barkhausen Criterion of oscillation, Oscillator operation, R-C phase shift oscillator, Wien bridge Oscillator, Crystal Oscillator.

Operational Amplifiers: Introduction, Basic information of Op-Amp, Ideal Operational Amplifier, Block Diagram Representation of Typical Op-Amp, OP-Amps Characteristics: Introduction, DC and AC characteristics, 741 op-amp & its features.

UNIT-IV:

OP-AMPS Applications: Introduction, Basic Op-Amp Applications, Instrumentation Amplifier, AC Amplifier, V to I and I to V Converter, Sample and Hold Circuit, Log and Antilog Amplifier, Multiplier and Divider, Differentiator, integrator.

Comparators and Waveform Generators: Introduction, Comparator, Square Wave Generator, Monostable Multivibrator, Triangular Wave Generator, Sine Wave Generators.

UNIT-V:
Timers and Phase Locked Loop: Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger, PLL block schematic, principles and description of individual blocks, 565 PLL, Applications of VCO (566). **Digital To Analog And Analog To Digital Converters:** Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, A-D Converters – parallel Comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC, DAC and ADC Specifications.

Textbooks:

1. Electronic Devices and Circuits- J. Millman, C.Halkias, Tata Mc-Graw Hill, 2nd Edition, 2010.
2. Linear Integrated Circuits – D. Roy Choudhury, New Age International (p) Ltd, 2nd Edition, 2003.

Reference Books:

1. Electronic Devices and Circuit Theory – Robert L.Boylestad and Lowis Nashelsky, Pearson Edition, 2021.
2. Electronic Devices and Circuits–G.K. Mithal, Khanna Publisher, 23rd Edition, 2017.
3. Electronic Devices and Circuits – David Bell, Oxford, 5thEdition, 2008.
4. Electronic Principles–Malvino, Albert Paul, and David J. Bates, McGraw-Hill/Higher Education, 2007.
5. Operational Amplifiers and Linear Integrated Circuits– Gayakwad R.A, Prentice Hall India, 2002.
6. Operational Amplifiers and Linear Integrated Circuits –Sanjay Sharma, Kataria & Sons, 2nd Edition, 2010.
7. Design of Analog CMOS Integrated Circuits - Behzad Razavi

Web Resources:

1. https://nptel.ac.in/courses/122106025.
2. https://nptel.ac.in/courses/108102112.

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

POWER SYSTEMS-I

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02402	PC	3	0	0	3	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the different types of power plants, operation of power plants
CO2:	Understand the concepts of distribution systems, underground cables, economic aspects and tariff
CO3:	Understand various substations that are located in distribution systems
CO4:	Apply the above concepts to illustrate different power generation layouts
CO5:	Analyze various economic aspects related to power generation and distribution

UNIT-I:

Hydroelectric Power Stations:

Selection of site, general layout of a hydroelectric power plant with brief description of major components and principle of operation

Thermal Power Stations:

Selection of site, general layout of a thermal power plant. Brief description of components: boilers, super heaters, economizers and electrostatic precipitators, steam turbines: impulse and reaction turbines, condensers, feed water circuit, cooling towers and chimney.

UNIT-II:

Nuclear Power Stations:

Location of nuclear power plant, working principle, nuclear fission, nuclear fuels, nuclear chain reaction, nuclear reactor components: moderators, control rods, reflectors and coolants, types of nuclear reactors and brief description of PWR, BWR and FBR. Radiation: radiation hazards and shielding, nuclear waste disposal.

UNIT-III:

Air Insulated Substations – indoor & outdoor substations, substations layouts of 33/11 kV showing the location of all the substation equipment.Bus bar arrangements in the sub- stations: simple arrangements like single bus bar, sectionalized single bus bar, double bus bar with one and two circuit breakers, main and transfer bus bar system with relevant diagrams.

Gas Insulated Substations (GIS) – advantages of gas insulated substations, constructional aspects of GIS, comparison of air insulated substations and gas insulated substations

UNIT-IV:

Distribution Systems:

Classification of Distribution systems, A.C Distribution, Overhead versus Underground system, Connection schemes of Distribution system, Requirements of Distribution system, Design considerations in Distribution system.

Underground Cables:

Types of cables, construction, types of insulating materials, calculation of insulation resistance, stress in insulation and power factor of cable. Capacitance of single and 3-Core belted Cables. Grading of cables: capacitance grading and inters heath grading.

UNIT-V:
Economic Aspects & Tariff: Economic Aspects – load curve, load duration and integrated load duration curves, discussion on economic aspects: connected load, maximum demand, demand factor, load factor, diversity factor, plant capacity factor and plant use factor, base and peak load plants. **Tariff Methods**– Costs of generation and their division into fixed, semi-fixed and running costs, desirable characteristics of a tariff method, tariff methods: simple rate, flat rate, block- rate, two-part, three–part, and power factor tariff methods, Time of Day (ToD) tariff and Time of Use (ToU) tariff.

Textbooks:

1. S. N. Singh, Electric Power Generation, Transmission and Distribution, PHI Learning Pvt Ltd, New Delhi, 2nd Edition, 2010
2. J. B. Gupta, Transmission and Distribution of Electrical Power, S. K. Kataria and sons,10th Edition, 2012

Reference Books:

1. I.J.Nagarath& D.P. Kothari, Power System Engineering, McGraw-Hill Education, 3rd Edition, 2019.
2. C.L.Wadhwa,Generation, Distribution and Utilization of Electrical Energy, New Age International Publishers, 6th Edition, 2018.
3. V. K. Mehta and Rohit Mehta, Principles of Power System, S. Chand, 4th Edition, 2005.
4. Turan Gonen, Electric Power Distribution System Engineering, McGraw-Hill, 1985.
5. Handbook of switchgear, BHEL, McGraw-Hill Education, 2007.

Web Resources:

1. https://nptel.ac.in/courses/108102047

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

INDUCTION AND SYNCHRONOUS MACHINES

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02403T	PC	3	0	0	3	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the construction, principle and operation of single phase and three phase induction motors
CO2:	Understand the construction, principle and operation of synchronous generator and synchronous motor
CO3:	Understand various applications of various alternating machines
CO4:	Apply the above concepts to solve various mathematical and complex problems
CO5:	Analyze the characteristics of induction motor, synchronous motor and synchronous generators

UNIT-I: 3-phase induction motors:
Construction of Squirrel cage and Slipring induction motors– production of rotating magnetic field – principle of operation – rotor emf and rotor frequency – rotor current and power factor at standstill and during running conditions– rotor power input, rotor copper loss and mechanical power developed and their inter-relationship –equivalent circuit – phasor diagram, Applications.
UNIT-II: Performance of 3-Phase induction motors:
Torque equation – expressions for maximum torque and starting torque – torque-slip characteristics – double cage and deep bar rotors –No load, Brake test and Blocked rotor tests – circle diagram for predetermination of performance- methods of starting –starting current and torque calculations -speed control of induction motor with V/f control method, rotor resistance control and rotor emf injection technique –crawling and cogging – induction generator operation.
UNIT-III: Single Phase Motors:
Single phase induction motors – constructional features – double revolving field theory, Cross field theory – equivalent circuit- starting methods: capacitor start capacitor run, capacitor start induction run, split phase & shaded pole, AC series motor, Applications.
UNIT-IV: Synchronous Generator:
Constructional features of non-salient and salient pole type alternators- armature windings – distributed and concentrated windings – distribution& pitch factors – E.M.F equation – armature reaction – voltage regulation by synchronous impedance method – MMF method and Potier triangle method –two reaction analysis of salient pole machines -methods of synchronization- Slip test – Parallel operation of alternators.
UNIT-V: Synchronous Motor:
Synchronous motor principle and theory of operation – Effect of excitation on current and power factor– synchronous condenser –expression for power developed –hunting and its suppression – methods of starting, Applications.

Textbooks:

1. Electrical Machinery, Dr. P.S. Bhimbra, Khanna Publishing, 2021,First Edition.
2. Performance and analysis of AC machines by M.G. Say, CBS, 2002.

Reference Books:

1. Electrical machines, D.P. Kothari and I.J. Nagrath, McGraw Hill Education, 2017, Fifth Edition.
2. Theory & Performance of Electrical Machines by J.B.Gupta, S.K.Kataria& Sons,2007.
3. Electric Machinery, A.E.Fitzgerald, Charles kingsley, Stephen D.Umans, McGraw- Hill, 2020, Seventh edition.

Web Resources:

1. https://nptel.ac.in/courses/108/105/108105131
2. https://nptel.ac.in/courses/108106072

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

CONTROL SYSTEMS

II B.Tech– II Semester								SJCET-R24
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
		L	T	P	C	CIA	SEE	Total
24G3A02404T	PC	3	0	0	3	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand the concepts of various mathematical representations of control systems, Time response of first order and second order systems, stability, frequency response and fundamentals of modern control systems
CO2:	Apply Block diagram reduction, Signal flow graph, Routh criterion, Root locus, Bode, Polar, Nyquist concepts for solving various numerical problems
CO3:	Analyze time response characteristics, frequency response characteristics, stability analysis of various control systems
CO4:	Design various compensators and controllers for different control systems by using design procedures
CO5:	Create suitable control systems for various real time applications

UNIT-I: CONTROL SYSTEMS CONCEPTS
Open loop and closed loop control systems and their differences- Examples of control systems- Classification of control systems, Feedback characteristics, Effects of positive and negative feedback, Mathematical models – Differential equations of translational and rotational mechanical systems and electrical systems, Analogous Systems, Block diagram reduction methods – Signal flow graphs - Reduction using Mason's gain formula. Principle of operation of DC and AC Servo motor, Transfer function of DC servo motor - AC servo motor, Synchros.
UNIT-II: TIME RESPONSE ANALYSIS
Step Response - Impulse Response - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants, P, PI, PID Controllers.
UNIT-III: STABILITY ANALYSIS IN TIME DOMAIN
The concept of stability – Routh's stability criterion – Stability and conditional stability – limitations of Routh's stability. The Root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.
UNIT-IV: FREQUENCY RESPONSE ANALYSIS
Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Stability Analysis from Bode Plots. Polar Plots-Nyquist Plots- Phase margin and Gain margin-Stability Analysis. Compensation techniques – Lag, Lead, Lag-Lead Compensator design in frequency Domain
UNIT-V: STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS
Concepts of state, state variables and state model, state models - differential equations & Transfer function models - Block diagrams. Diagonalization, Transfer function from state model, Solving the Time invariant state Equations-State Transition Matrix and it's Properties. System response through State Space models. The concepts of controllability and observability, Duality between controllability and observability.

Textbooks:

1. Modern Control Engineering by Katsuhiko Ogata, Prentice Hall of India Pvt. Ltd., 5th edition, 2010.
2. Control Systems Engineering by I. J. Nagrath and M. Gopal, New Age International (P) Limited Publishers, 5th edition, 2007.

Reference Books:

1. Control Systems Principles & Design by M.Gopal, 4th Edition, Mc Graw Hill Education, 2012.
2. Automatic Control Systems by B. C. Kuo and Farid Golnaraghi, John wiley and sons, 8th edition, 2003.
3. Feedback and Control Systems, Joseph J Distefano III, Allen R Stubberud & Ivan J Williams, 2nd Edition, Schaum's outlines, Mc Graw Hill Education, 2013.
4. Control System Design by Graham C. Goodwin, Stefan F. Graebe and Mario E. Salgado, Pearson, 2000.
5. Feedback Control of Dynamic Systems by Gene F. Franklin, J.D. Powell and Abbas Emami-Naeini, 6th Edition, Pearson, 2010.

Web Resources:

1. https://nptel.ac.in/courses/108102043
2. https://nptel.ac.in/courses/108106098.

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

INDUCTION AND SYNCHRONOUS MACHINES LAB

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
23A02403P	PC	0	0	3	1.5	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Analyze various performance characteristics of 3-phase and 1-phase induction motors
CO2:	Evaluate the performance of 3-phase Induction Motor by obtaining the circle diagram and equivalent circuit of 3-phase Induction Motor and single phasenduction motor
CO3:	Adapt the power factor improvement methods for single phase Induction Motor
CO4:	Pre-determine the regulation of 3-phase alternator
CO5:	Determine the synchronous machine reactance of 3-phase alternator

List of Experiments

Any 10 experiments of the following are required to be conducted

S.No.	Title of the Experiment
1	Brake test on three phase Induction Motor.
2	Circle diagram of three phase induction motor.
3	Speed control of three phase induction motor by V/f method.
4	Equivalent circuit of single-phase induction motor.
5	Power factor improvement of single-phase induction motor by using capacitors.
6	Load test on single phase induction motor.
7	Regulation of a three -phase alternator by synchronous impedance &MMF methods.
8	Regulation of three-phase alternator by Potier triangle method.
9	V and Inverted V curves of a three-phase synchronous motor.
10	Determination of Xd, Xq& Regulation of a salient pole synchronous generator.
11	Determination of efficiency of three phase alternator by loading with three phase induction motor.
12	Parallel operation of three-phase alternator under no-load and load conditions.
13	Determination of efficiency of a single-phase AC series Motor by conducting Brake test.

Reference:

1. https://em-coep.vlabs.ac.in/List%20of%20experiments.html

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

CONTROL SYSTEMS LAB

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A02404P	PC	0	0	3	1.5	30	70	100

Course Outcomes:

After the completion of the course students will be able to

CO1:	Understand how to use feedback control system to determine transfer function of DC servo motor and any other given circuit with R, L and C components
CO2:	Model the systems and able to design the controllers and compensators.
CO3:	Get the knowledge about the effect of poles and zeros location on transient and steady state behavior of second order systems and implement through software tools
CO4:	Determine the performance and time domain specifications of first and second order systems.
CO5:	Understand the stability analysis

List of Experiments

Any 10 experiments of the following are required to be conducted

S.No.	Title of the Experiment
1	Time response of Second order system
2	Characteristics of Synchros
3	Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions and application of speed control of motor.
4	Effect of feedback on DC servo motor
5	Transfer function of DC Machine
6	Effect of P, PD, PI, PID Controller on a second order system
7	Lag and lead compensation – Magnitude and phase plot
8	Temperature controller using PID
9	Characteristics of magnetic amplifiers
10	Characteristics of AC servo motor.
11	Linear system analysis (Time domain analysis, Error analysis) using MATLAB.
12	Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system using MATLAB.
13	State space model for classical transfer function using MATLAB – Verification.

St.Johns College of Engineering and Technology

(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

PYTHON PROGRAMMING

II B.Tech– II Semester								SJCET-R24
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24G3A05304	SEH	0	1	2	2	30	70	100

Course Objectives:

- Introduce core programming concepts of Python programming language.
- Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications using these

Course Outcomes:

After the completion of the course students will be able to

CO1:	Showcase adept command of Python syntax, deftly utilizing variables, data types, control structures, functions, modules, and exception handling to engineer robust and efficient code solutions
CO2:	Apply Python programming concepts to solve a variety of computational problems
CO3:	Understand the principles of object-oriented programming (OOP) in Python, including classes, objects, inheritance, polymorphism, and encapsulation, and apply them to design and implement Python programs
CO4:	Proficient in using commonly used Python libraries and frameworks such as JSON, XML, NumPy, pandas
CO5:	Exhibit competence in implementing and manipulating fundamental data structures such as lists, tuples, sets, dictionaries

UNIT-I:

History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook.

Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.

Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:

1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable
4. Demonstrate the following Operators in Python with suitable examples. Arithmetic Operators ii) Relational Operators iii) Assignment Operators iv) Logical Operators v) Bit wise Operators vi) Ternary Operator vii)Membership Operators viii) Identity Operators
5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number

UNIT-II:

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.

Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:

7. Write a program to define a function with multiple return values.
8 Write a program to define a function using default arguments.
9. Write a program to find the length of the string without using any library functions.
10. Write a program to check if the substring is present in a given string or not.
11. Write a program to perform the given operations on a list:
    i. addition ii. Insertion iii. slicing
12. Write a program to perform any 5 built-in functions by taking any list.

UNIT-III:

Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.

Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Sample Experiments:

13. Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.
14. Write a program to count the number of vowels in a string (No control flow allowed).
15. Write a program to check if a given key exists in a dictionary or not.
16. Write a program to add a new key-value pair to an existing dictionary.
17. Write a program to sum all the items in a given dictionary.

UNIT-IV:

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism.

Sample Experiments:

18. Write a program to sort words in a file and put them in another file. The output file should have only lower-case words, so any upper-case words from source must be lowered.
19. Python program to print each line of a file in reverse order.
20. Python program to compute the number of characters, words and lines in a file.
21. Write a program to create, display, append, insert and reverse the order of

the items in the array.

22. Write a program to add, transpose and multiply two matrices.
23. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

UNIT-V:

Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Sample Experiments:

24. Python program to check whether a JSON string contains complex object or not.
25. Python Program to demonstrate NumPy arrays creation using array () function.
26. Python program to demonstrate use of ndim, shape, size, dtype.
27. Python program to demonstrate basic slicing, integer and Boolean indexing.
28. Python program to find min, max, sum, cumulative sum of array
29. Create a dictionary with at least five keys and each key represent value as a list where this list contains at least ten values and convert this dictionary as a pandas data frame and explore the data through the data frame as follows:

a)Apply head () function to the pandas data frame
b)Perform various data selection operations on Data Frame

30. Select any two columns from the above data frame, and observe the change in one attribute with respect to other attribute with scatter and plot operations in matplotlib

Reference Books:

1. Gowri shankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2nd Edition, Pearson, 2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

Online Learning Resources/Virtual Labs:

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

St.Johns College of Engineering and Technology

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DEPARTMENT OF ELECTRICAL & ELECTRONICS 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: After the completion of the course students will be able to

CO1:	Define the concepts related to design thinking
CO2:	Explain the fundamentals of Design Thinking and innovation
CO3:	Apply the design thinking techniques for solving problems in various sectors.
CO4:	Analyse to work in a multidisciplinary environment
CO5:	Evaluate the value of creativity
CO6:	Formulate specific problem statements of real time issues

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 startup

Textbooks:

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

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DEPARTMENT OF ELECTRICAL & ELECTRONICS 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.

•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 –

- 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.
- 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

•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

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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. Womn's Rights
3. Domstic Violence
4. Prevntion and Control of Cancer
5. Prootion 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

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. Health
    iii. 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.