III Semester B.TECH. (Electrical Engineering)

ELECTRICAL ENGINEERING MATHEMATICS

(Credits-04) **Subject Code:**BTCHEE301T

Teaching Scheme: Theory-03 Tutorial-01 Practical-00 Total-04

Examination Scheme: Internal Assessment-30 End Semester Assessment-70 Total-100

Learning Objectives: Students will be able to

- apply the various methods for the solution to partial differential equations
- analyze the systems with complex variables
- explore the basics of various transformation methods
- apply the mathematical analysis to electrical circuits and systems
- mathematical modeling and probability

Course Outcomes: UNIT COs Learning Outcomes

CO1: Solution of Partial Differential Equations of First Order First Degree, Numerical Solution to Ordinary differential equations

CO2: Formulation and solving the systems with complex variables

CO3: Understanding the basics of various Transforms and converting the functions into required transforms, Laplace Transforms analysis and its application to solve differential equations

CO4: Application of Differential equations and Laplace Transform for mathematical model formulation of the physical systems, Understanding the concept of transfer function

CO5: Understanding the concepts of Stochastic analysis and its application

UNIT – I: PARTIAL DIFFERENTIAL EQUATIONS (08Hrs)

Partial Differential Equations of First Order First Degree i.e. Lagrange's form, Linear Homogeneous Equations of higher order with constant coefficients. Method of separations of variables, Numerical solution of ordinary differential equations :Taylor's series method, RungeKutta 4th order method, Euler's modified method. Milne, s Predictor- Corrector method, Solution of Second Order Differential Equations and Simultaneous Differential Equations by Runge- Kutta method.

UNIT- II: FUNCTIONS OF COMPLEX VARIABLE (09Hrs)

Analytic function, Cauchy- Riemann Conditions, Harmonic Functions (excluding orthogonal system), Milne-Thomson Method, Cauchy Integral Theorem & Integral Formula (Statement only), Taylor's & Laurent's series (Statement only), Zeros and Singularities of Analytic function, Residue Theorem (Statement only), Contour integration (Evaluation of real definite integral around unit circle and semi-circle).

UNIT –III: Introduction to Transformation Methods (10Hrs)

Introduction to various transform methods, Definition and fundamentals of Laplace Transforms Simple Applications of Laplace Transform to solve Partial Differential Equations (One dimensional only). Laplace transform of step, ramp & parabolic signals, Time response of first order systems and second order systems for unit step input, Concept of characteristic equation q(s) = 0 vs time response, Introduction to Fourier and z-Transform,

UNIT–IV : MATHEMATICAL MODELING AND TRANSFER FUNCTION (08Hrs)

Mathematical Modeling of physical systems and Differential equations (Mechanical systems, basic translational and rotational systems, basic R-L-C series and parallel circuits), Concept of transfer function, Transfer function for elementary R-L-C circuits, Elementary block diagram single input single output closed loop system and its reduction.

UNIT – V: THEORY OF PROBABILITY (07Hrs)

Axioms of Probability, Conditional Probability, Baye's Rule, Random variables: Discrete and Continuous random variables, Probability function and Distribution function, Mathematical Expectation, Functions of random variable, Variance & Standard Deviation, Moments, Moment generating function, Measures of central tendency and Dispersion, Skewness and Kurtosis. Binomial distribution, Poisson distribution, Normal distribution.

Text Books: 1. Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication

2. A Text Book of applied Mathematics, Volume II , by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan

3. Mathematics for Engineers by Chandrika Prasad

4. A text book of Engineering Mathematics by N. P. Bali & M. Goyal, Laxmi Publication.

5. Theory & Problems of Probability and Statistics by Murray R. Spiegel , Schaum Series, McGraw Hills

Reference Books:

1. Advanced Engineering Mathematics by Erwin Kreysizig, 8th Edition, Wiley India

2. Introductory methods of Numerical Analysis, by S.S. Sastry, PHI 3. Applied Mathematics for Engineers & Physicist by L.R. Pipes and Harvill

III Semester B.TECH. (Electrical Engineering)

NETWORK ANALYSIS

Total Credit- 04 **Subject Code**:**-BTCHEE3O2T**

Teaching Scheme : Theory-03 Hours/Week

Examination Scheme: Th (U)= 70 Th(I)=30 Tutorial/ Activity -01 Hours/Week

Duration of University Exam:- 3 Hours Practical:- 02 Hours/ Week

Course Objectives Students will be able to –

• To provide various methods of analysis of electric networks under transient and steady state conditions.

• To provide concrete foundation needed to learn future professional courses.

Course Outcomes: After studying the course, the students will be able to demonstrate the ability to

CO1. Apply mesh current and node voltage methods to analyze electrical circuits.

CO2. Apply network theorems for the analysis of networks.

CO3. Obtain transient and steady-state responses of electrical circuits.

CO4. Synthesize waveforms and apply Laplace transforms to analyze networks.

CO5. Evaluate different Network Functions and understand two port network behavior

Unit –I: Sources, Mesh Analysis, Node voltage analysis (07 Hrs)

Voltage and Current sources, source transformation, mesh basis equilibrium approach for simple networks of having mutual coupling, Node voltage analysis of networks, concept of duality.

Unit –II: Network Theorems (07 Hrs)

Thevenin's, Norton's, Maximum Power transfer, Reciprocity theorems as applied to D C. & A. C. circuits with independent and dependent sources

. **Unit –III: Solution of First and Second Order Networks (07 Hrs**)

Solution of first and second order differential equations of different combinations of series and parallel RLC networks. Initial and final conditions in network elements, free and forced response, time constants.

Unit –IV: Electric Circuit Analysis using Laplace Transforms (07 Hrs)

Review of Laplace transform, waveform synthesis, Analysis of electrical circuits using Laplace transform for standard inputs, analysis of networks with and without initial conditions using Laplace transforms.

Unit –V: Two port networks and Network functions (08 Hrs)

Two port networks, relationship between two port variables, driving point and transfer functions, properties, concept of complex frequency, Poles and zeros. Two port network parameters: Impedance parameters, admittance parameters, transmission parameters and hybrid parameters, interconnection of two port networks.

Text Books:

1. Van Valkenburg, “Network Analysis”, Third Edition, 2009, Prentice Hall of India

2. Sudhakar, A, Shyammohan, “Circuits and Networks”, Third Edition, 2006, Tata McGraw-Hill.

3. D. Roy Choudhary, “Networks and Systems”, New Age International Publishers, 2nd Edition, 2012

4. Kelkar and Pandit, “Linear Network Theory”, Pratibha Publications.

Reference Books:

1. Mahmood Nahvi, Joseph A Edminister, “Schaum’s outline of Electric Circuits”, 6th Edition, Tata McGraw-Hill, 6th Edition, 2013

2. W. H. Hayt and J. E. Kemmerly, “Engineering Circuit Analysis”, McGraw Hill Education, 2013.

3. C. K. Alexander and M. N. O. Sadiku, “Electric Circuits”, McGraw Hill Education, 2004.

4. K. V. V. Murthy and M. S. Kamath, “Basic Circuit Analysis”, Jaico Publishers, 1999

. 5. K. Sureshkumar, “Electric Circuits & Network”, Pearson Publication

6. Del Toro, “Electrical circuit”, Prentice Hall III Semester B.E. (Electrical Engineering

III Semester B.TECH. (Electrical Engineering)

NETWORK ANALYSIS (Practical)

Total Credit- 01 **Subject Code**:-BTCHEE3O2P

Teaching Scheme Examination Scheme Practical:- 02 Hours/ Week Pr (U)= 25 Pr(I)=25

Course Objectives Students will be able to –

• To choose appropriate measuring instruments along with proper rating of wires to carry out various experiments

• To provide hands on experience of substantiating and verifying the theoretical concepts studied in Network Analysis.

Hands on Experiments related to the course contents of Network Analysis

(minimum 10 experiments).

III **Semester B.TECH. (Electrical Engineering)**

ELECTRICAL MEASUREMENT AND INSTRUMENTATION

Total Credit- 04 **Subject Code:-**BTCHEE3O3T

Teaching Scheme Examination Scheme :Theory-03 Hours/Week Th (U)= 70 Th(I)=30
Tutorial/ Activity -01 Hours/Week Duration of University Exam:- 3 Hours Practical:- 02 Hours/ Week

Course Objectives: Students will be able to –

• Understand the characteristics and operation of different electrical instrument used for measurement of electrical and non-electrical parameters

• Measurement of active and passive components of electrical circuit using various bridges and transducers. Course Outcomes: After studying the course, the students have understood:

CO1. Various aspects of measurement and instrumentation.

CO2. Different active and passive components measurement methods.

CO3. Power and Energy measurement.

CO4. Instrument Transformers.

CO5. Aspects and types of transducers.

Unit I: Generalized Measuring Instruments: (08Hrs.)

Classification of Instruments, forces acting in Indicating instruments, Moving iron, PMMC type instruments, Static and Dynamic characteristics and performance of instruments, Errors in measurements, loading effect of instruments.

Unit II: Measurement of RLC Elements (08Hrs.)

Measurement of Resistance: classification, Measurement of medium resistance :- Wheatstone Bridge. Low resistance: - Kelvin's Double Bridge. High resistance:- Ohm meter, Megger & loss of charge method. Measurement of inductance using Maxwell's inductance-capacitance bridge, Measurement of Capacitance using Schering bridge.

Unit III: Measurement of Power and Energy (08Hrs.)

True RMS Measurement, Blondel's Theorem, Measurement of active, reactive and apparent power in polyphase circuits. Electrodynamometer type wattmeter, Measurement of Energy in single and

polyphase circuits, Induction type Energy meter, digital energy meters. Special Instruments: Power factor meter, frequency meter, synchronoscope

Unit IV: Instrument Transformers (08Hrs.)

General theory of Instrument transformers, various ratios, burden, characteristics and Phasor diagram of Current transformer and potential transformers & extension of range using C.T. & P.T., errors in instrument transformers.

Unit V: (Part A) Analog Transducer (06Hrs.)

Classification of Transducer, Measurement of Electric quantities through Resistive, inductive, capacitive effects, Measurement of Non-electric quantities like Displacement, pressure, Torque, Flow. Special Instruments: load cell, seismic instruments, Anemometer, Pyrometer.

(Part B) Digital Measuring Instruments (06 Hrs.) Definition of Digital transducer, Classification, Introduction to digital measurement, Measurement of Electric quantities like Digital Encoder, Hall effect sensor, Latest trends of measurement in power sector like SCADA, EMS.

Text Books:

1. A.K. Sawhney, “A Course in Electrical & Electronics Measurement and Instrumentation”, Dhanpat Rai & Sons, 2015

2. E.W. Golding & F.C. Widdis, “Electrical Measurement & Measuring Instrument”, A.H. Wheeler & Co. India.

3. C.S. Rangan, G.R. Sharma, V.A.V. Mani, “Instrumentation, Devices and Systems”, TMH, 2nd edition

Reference Books:

1. Ernest O.Doebelin, “Measurement Systems Application and Design, International Student Edition”, McGraw Hill Book Company, 1998.

2. Alan S. Morris, Reza Langari, “Measurement and Instrumentation: Theory and application”, Academic Press, 2012

3. Rajendra Prashad, “Electrical Measurement &Measuring Instrument” Khanna Publisher.

4. J.B. Gupta, “Electrical Measurements and Measuring Instruments”, S.K. Kataria & Sons

5. H.S. Kalsi, “Electronic Instrumentation”, 6th Edition McGraw Hill

6. W.D. Cooper, “Electronic Instrument & Measurement Technique” Prentice Hall International.

7. Dr. V. Kamaraju “Electrical Power Distribution System” McGraw Hill Education (1 July 2017

III Semester B.TECH. (Electrical Engineering)

ELECTRICAL MEASUREMENT AND INSTRUMENTATION (Practical)

Total Credit- 01 **Subject Code**:-BTCHEE3O3P

Teaching Scheme Examination Scheme : Practical:- 02 Hours/ Week Pr (U)= 25 Pr(I)=25

List of Experiments:(Any 10)

1. Measurement of low resistance by Kelvin's Double Bridge.
2. Measurement of medium resistance by Ammeter Voltmeter Method.
3. Measurement of high resistance by Loss of Charge Method.
4. Measurement of Capacitance by schering bridge.
5. Measurement of inductance by Maxwell's bridge.
6. Measurement of three phase power by Two Wattmeter method.
7. Study of Differential and Additive connection of current transformer.
8. Reactive power measurement by one wattmeter method.
9. Calibration of energy meter.
10. Study of Differential and Additive connection of current transformer.
11. Measurement of energy using different CTs and PTs.
12. Determination of polarities and ratio of various CTs and PTs.
13. To study and plot the characteristics of LVDT.
14. To study and plot the characteristics of Stain gauge.
15. To analyse the characteristics of the Piezo electric sensor.
16. Study the performance and characteristics of Hall Effect voltage sensor.

Activity:

1. To assemble the components of a given electrical circuit. (Resistor, ammeter, voltmeter , battery, one way key, rheostat, connecting wires.

2. To measure the resistance and impedance of an inductor with or without iron core.

3. To measure resistance, voltage (dc/ac), current (dc) and check continuity of a given circuit using a multimeter.

4. To assemble a household circuit comprising of three bulbs, three (on/off) switches, a fuse and a power source.

5. To study the variation in potential drop with length of a wire for a steady current.

6. Measurement of Earth Resistance.

7. Calculation of residential and commercial energy bill

III Semester B.TECH. (Electrical Engineering)

ANALOG DEVICES AND CIRCUITS

Total Credit- 04 **Subject Code:**-BTCHEE3O4T

Teaching Scheme Examination Scheme Theory-03 Hours/Week Th (U)= 70 Th(I)=30
Tutorial/ Activity -01 Hours/Week Duration of University Exam:- 3 Hours Practical:- 02 Hours/ Week

Course Objectives Students will be able to –

• To provide basic knowledge and applications of diodes, transistors and MOSFETs.

• To provide basic functioning of OP-AMPs and applications of OP-AMPs. Course Outcomes: After studying the course, the students will be able to demonstrate the ability to

CO1. Design and Analyze rectifier circuits

CO2. Understand the characteristics and use of a transistor as amplifiers

CO3. Apply the knowledge of transistor for the analysis of power amplifiers and oscillators.

CO4. Understand OP-AMPs. CO5. Analyze and utilize OP-AMPs

Unit I: Diode Circuits: (07 Hrs.)

P-N junction diode, operation and characteristics; half-wave and full-wave rectifiers, Filters, Ripple factor, characteristics and applications of Zener diodes, photo diodes, LED, Schottkey Diodes, voltage regulators

Unit II: Transistor Circuits (08 Hrs.

Operation and characteristics of a BJT. BJT as a switch. BJT as an amplifier: Biasing circuits, small-signal analysis of CE, CB and CC amplifiers, high-frequency analysis. Power Transistors, Transistor as a switch. Field effect transistors and MOSFETs- Principle of operation and characteristics, biasing arrangements

Unit III: Power amplifiers (08 Hrs.)

Classification as A, B, AB, C, Push pull amplifiers, Cross over distortion, Positive and Negative amplifiers-classification, feedback amplifiers, advantages and applications Oscillators- Barkhausen's criterion, RC and Crystal oscillators

Unit IV: Power amplifiers (08 Hrs.)

Differential amplifier circuits and their stages, current source, biasing, level Shifting techniques, Common mode and differential mode gain, Impedance of different stages.

Unit V: Applications of Op-Amp (08 Hrs.)

Inverting and non-inverting amplifier, integrator, active filter, voltage regulator, oscillators (Wein bridge and phase shift). Analog to Digital Conversion. Hysteresis Comparator, Zero Crossing Detector, Square-wave and triangular-wave generators. Precision rectifier. Study of linear ICs: LM741, LM555, LM 7805

Text books:

1. Millman and Halkias, "Electronic Devices and Circuits", McGraw Hill.

2. Millman and Halkias, "Integrated Electronics", McGraw Hill

3. J. V. Wait, L. P. Huelsman and G. A. Korn, "Introduction to Operational Amplifier theory and applications", McGraw Hill U. S., 1992.

4. R. Gaikwad, "Operational Amplifiers and applications"

5. Linear ICs Manual I, II, III, National Semiconductors

Reference Books:

1. J. Millman and A. Grabel, "Microelectronics", McGraw Hill Education, 1988.

2. P. Horowitz and W. Hill, "The Art of Electronics", Cambridge University Press, 1989.

3. P. R. Gray, R. G. Meyer and S. Lewis, "Analysis and Design of Analog Integrated Circuits", John Wiley & Sons, 2001.

III Semester B.TECH. (Electrical Engineering)

ANALOG DEVICES AND CIRCUITS

Total Credit- 01 **Subject Code**:-BTCHEE3O4P

Teaching Scheme /Examination Scheme: Practical:- 02 Hours/ Week Pr (U)= 25 Pr(I)=2

10 Experiments based on above syllabus

III Semester B.TECH. (Electrical Engineering)

RENEWABLE ENERGY STUDIES

Total Credit- 03 **Subject Code**:-BTCHEE3O5T

Teaching Scheme Examination Scheme Theory-03 Hours/Week Th (U)= 70 Th(I)=30
Tutorial/ Activity -0 Duration of University Exam:- 3 Hours Practical:-00

Course Objectives Students will be able to –

• Demonstrate understanding of the different types of renewable energy technologies that are currently available, and how they are used to provide energy.

• Identify strengths and limitations associated with the different renewable energy technologies.

• Identify the current major uses of energy (i.e., in agriculture, manufacturing, residential, etc.).

Course Outcomes: After studying the course, the students will be able to demonstrate the ability to
CO1. Memorize the fundamental of solar radiation geometry

CO2. Identify and analyse the process of power generation through solar photovoltaic

CO3. Highlighting the various applications of Solar Energy.

CO4. Outline the site requirement criteria for wind farm & compare different types of wind generators.
CO5. Identifying non-conventional Energy sources such as Geothermal, MHD, Biomass, Fuel cell, Tidal, Ocean for generating Electricity.

Unit I- Solar Radiation & its Measurement (06 Hrs)

Solar Radiation & its Measurement: Solar Constant, Solar radiation at earth's surface, solar radiation geometry, solar radiation measurement, estimation of average solar radiation, solar radiation on tilted surfaces.

Unit 2 – Solar Photovoltaic power generation (10 Hrs)

Solar Photovoltaic power generation: Physics of solar cells, Characteristic of solar cell, series and parallel connection, types of solar cell, module manufacturing, partial shading, bypass and blocking diode, load calculation, different panel calculations and selection (Monocrystalline, Polycrystalline etc), Calculation of Solar rooftop setup (rating): stand alone PV system with battery and grid connected PV system with Net Metering, Introduction to MPPT.

Unit-3 Application of Solar Energy (07 Hrs)

Application of Solar Energy: Solar water heating, space heating, space cooling, solar thermal heat conversion, Solar Cooking, Solar pumping, Solar Water pumping for agriculture purposes, Calculation of solar setup required in solar water pumping, Solar Green Houses, Hydrogen production from Solar Energy.

Unit – 4 Wind Energy (10 Hrs)

Basic principles of wind energy conversion, wind energy conversion system, wind data & energy estimation, site selection consideration, basic components of wind energy conversion system (WECS), classification of WEC system, generating system, energy storage, application of wind energy. Stand-Alone and Grid Connected Wind-Electrical Power System

Unit- 5 Other Nonconventional Energy Source (07 Hrs)

Brief Introduction to operating principles only: Small scale hydro electric power generation, Energy from Bio –Mass, Geothermal Energy, MHD power generation, Fuel cell, Energy from Ocean, Ocean thermal electric conversion (OTEC), Claude & Anderson cycles, Hybrid cycle, Energy from Tides ,Estimation of Energy & Power in simple single basin ,Tidal system

Text Books: 1. Non Conventional Energy Sources G.D. Rai, Khanna publishers

2. Non Conventional Energy Resources B. H. Khan 2nd , The McGraw Hill Companies

3. Solar Energy: Principles of thermal collection and storage, S. P. Sukhatme 2nd edition, Tata McGraw Hill Publishing Company Ltd.

4. Solar Photovoltaics: Fundamental, Technologies and Applications, Chetan Singh Solanki , 3 rd Edition, PHI Learning Pvt. Ltd.

5. Non-Conventional Energy Sources and Utilization, R.K. Rajput, S. Chand Publications.

6. Non-Conventional Energy Resources, D S Chauhan, S K Srivastava, New Age International Publishers

Reference Books: 1. Fundamentals of Renewable Energy Processes, Aldo Vieira da Rosa, Juan Carlos Ordóñez, Fourth Edition, Elsevier Academic Press

2. Wind and Solar Power Systems: Design, Analysis, and Operation, Mukund R. Patel and Omid Beik, THIRD EDITION CRC PRESS(TAYLOR & FRANCIS)

3. Renewable & Efficient Electric Power Systems, Gilbert Masters John,, Wiley and son’s publications.

4. Solar Energy , Robert Foster, Majid Ghassemi and Alma Cota, CRC Press

5. Renewable Energy Systems, David M. Buchla, Thomas E. Kissell, Thomas L Floyd, 1st edition, Pearson Publication

6. Ocean Energy: Tide and Tidal Power, R. H. Charlier, Charles W. Finkl, SPRINGER

Reference Links: http://www.nptel.iitm.ac.in/ www.ocw.mit.edu

III Semester B.TECH. (Electrical Engineering) ENVIRONMENTAL STUDIES

Non – credit (Audit) **Subject Code**:- BTCHEE307T

Teaching Scheme Examination Scheme : At college level Theory – 01 Hours/Week Th (C) = 35, Th (I) = 15
Tutorial/Activity – 1 Hours/Week Duration of college Exam: 2 Hours

Unit- I Air pollution and its control techniques: [06 Hours]

Contaminant behavior in the environment, air pollution due to Sox, NOx, photochemical smog. Indoor air pollution Natural pathways for degradation: Carbon cycle, Sulphur cycle, Nitrogen cycle, Oxygen cycle. Factors responsible for altering the composition of atmosphere (deforestation, burning of fossil fuels, industrial and vehicular emissions, CFCs). Techniques to control air pollution, ambient air quality and continuous air quality monitoring, control measures at source, Kyoto Protocol, Carbon Credits.

Unit – II Water pollution and its control techniques: [06 Hours]

Major sources of water pollution: Eutrophication, acid mine drains, pesticides and fertilizers, dyeing and tanning, marine pollution, micro plastics. Techniques to control water pollution: Conventional waste water treatment-types of sewage, sewerage system, alternative systems, primary, secondary and tertiary processes including aerobic and anaerobic techniques, safe disposal and its utility. Treatment schemes for waste water from dairy, textile, power plants, pharmaceutical industries, and agro based industries such as rice mills.

Unit –III other Environmental Pollution & Waste Management: [06 Hours]

Soil pollution: Soil around us. Soil water characteristics, soil pollution. Causes, effects & control : noise pollution, nuclear & radiation hazards, marine pollution (Oil spills & Ocean Acidification) Solid waste management: Compositing, vermiculture, landfills, hazardous waste treatment. Bioremediation technologies, conventional techniques (land farming, constructed wetlands), and Phytoremediation. Degradation of xenobioties in environment: Petroleum hydrocarbons, pesticides, heavy metals introduction, types of e-wastes, environmental impact, e-waste recycling. e-waste recycling, ewaste management rules .

Unit-IV Social Issues and the Environmental Laws [06 Hours]

Concept of Sustainable development water conservation. Rain water harvesting, watershed management Resettlement and rehabilitation of people; its problems and concerns. Environmental Laws

(brief idea only) 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. Different government initiatives (brief idea only)- National ambient air quality standard 2009, Swachh Bharat Abhiyan, National afforestation program and Act- 2016, National River conservation plan and National Ganga River basin authority, Formation of National Green

Tutorial. Activity

1. Field Trip & Report Writing

2. Case-study & Report Writing

Reference Books:

1. Benny joseph, Environmental Studies, Mc Graw Hill Education (India) Private Limited

2. B.K. Sharma, Environmental Chemistry, Goel Publishing House, Meerut

3. P Aarne Vesilind, J. Jeffrey Peirce and Ruth F. Weiner, Environmental Pollution and Control, Butterworth-Heinemann

4. D.D. Mishra, S.S. Dara, A Textbook of Environmental Chemistry and Pollution Contol, S. Chand & company Ltd.

5. Shree Nath Singh, Microbial Degradation of Xenobiotics, Springer-Verlag Berlin Heidelberg

6. Indian Environmental Law: Key concepts and Principles edited by Shibani Ghosh, Publisher, Orient BlackSwan, 2019. ISBN, 9352875796.

7. P. Thangavel & Sridevi, Environmental Sustainability: Role of Green techn Springer publications.

III Semester B.TECH. (Electrical Engineering)

INTRODUCTION TO PYTHON PROGRAMMING

Total Credit- 01 **Subject Code**:-BTCHEE3O6T

Teaching Scheme Examination Scheme Theory-01 Hours/Week Th (U)= 35 Th(I)=15 Tutorial/ Activity - Duration of University Exam:- 2 Hours Practical:- 02 Hours/ Week

Course Objectives Students will be able to –

- To understand why Python is a useful scripting language for developers
- To learn how to design and program Python applications
- To learn how to use lists, tuples, and dictionaries in Python programs
- To learn how to identify Python object types.

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

CO1. Identify different operators and execute different programs using loops

CO2. Analyse Strings, List, Tuples, Dictionary and Sets

CO3. Illustrate functions and utilise Date Time in programming language.

UnitI : Introduction To Python (04 Hrs.)

Introduction To Python, Operators, Identifiers, Variables, Relational Operators, User Input And Output

Unit II: Data Types Of Python (05 Hrs.

) Strings – Indexing, Slicing, Methods For Strings – Isupper, Upper, Lower, Find, Swapcase Etc, List – Indexing, Slicing, Copy (Deep And Shallow), Methods For List – len, append, extend, sort ,insert, delete, pop, max, min, sum, count etc, List Comprehensions, TUPLES – discard, remove and pop, DICTIONARY – creation method, lists of tuple in dictionary, list of list in dictionary, len and del in dictionary, Deep and shallow copy in dictionary, Methods for dictionary, dictionary comprehension, SETS

Unit III : Functions, Loops And Modules (05 Hrs.)

Control Statement - Conditional Statement Like If, Else, Elif , Loop- While, For, Loop Control Statement - Break, Continue, Pass, Introduction To Functions, Logic With Python Functions, Keyword Arguments, Args And Kwargs, Return Statement, Lambda, Map And Filter, Import Module , Datetime With Python And Exception Handling Time Class,Date Time Class, Date From Time Stamp, Time Delta, String Format Time, String Past Time, Handling Timezone In Python, Exception Handling- Try, Except, Finally

Text Books

1. Programming And Problem Solving With Python by Ashok Namdev Kamthane and Amit Ashok Kamthane, McGraw Hill

2. Let Us Python, Yashwant Kanetkar and Aditya Kanetkar, 2nd Edition, bpb Press

3. Python Crash Course, 2Nd Edition: A Hands-On, Project-Based Introduction To Programming, Eric Matthes (No Starch Press, 2016)

4. Zero To Mastery In Python Programming, Best Python Book For Beginners, by RAKESH K. YADAV , SRINIVAS ARUKONDA, MONU SINGH, VEI Publishers

5. Core Python Programming - Covers Fundamentals to Advanced Topics Like OOPS, Exceptions, Data Structures, Files, Threads, Networking, GUI, DB Connectivity and Data Science Second, Rao R. Nageswara, Dreamtech Press

6. Python Programming: Using Problem Solving Approach, Reema Thareja, Oxford Higher Education

Reference Book

1. Mark Lutz, Programming Python, O`Reilly, 4th Edition, 2010

2. Michael Urban and Joel Murach, Python Programming, Shroff/Murach, 2016

3. Head First Python 2e: A Brain-Friendly Guide By Paul Barry, Oreilly Publicatio

III Semester B.TCH. (Electrical Engineering)

INTRODUCTION TO PYTHON PROGRAMMING

Total Credit- 01 **Subject Code**:-BTCHEE3O6P

Teaching Scheme Examination Scheme Practical:- 02 Hours/ Week Pr(U)= 25 Pr(I)=15

List of Practical's (Minimum 10 experiments should be performed)

1. Print only the words that starts with letter 's' in the following statement –

2. St- 'print only the word that starts with s in this sentence'

3. Print Every word from the below sentence which has even number of letters – 4. St- 'print only the word that starts with s in this sentence'

4. write a program that prints the integer from 1 to 100, but for multiples of 3 print 'FIZZ' instead of number and for multiples of five print 'BUZZ'. For numbers which are multiples of both 3 and 5 print 'FIZZBUZZ

' 5. Write a program using function to check who is employee of the month.

6. Write a program to mimic the carnival game 'Three Cup Montee'

7. write a program that returns the lesser of two given numbers if both numbers are even, but returns the greater if one or both numbers are odd.

8. Write a python function that accepts a string and calculate the number of upper case letters and lower case letters.

9. Write a python function that takes a list and return anew list with unique elements of the first list. For example, 5. Sample List =[1,1,1,2,2,3,3,4] 6. Unique List = [1,2,3,4]

10. Write a python function to multiply all the numbers in the list

11. Write a program for validating the user input

12. Using Object oriented Programming, write a program for opening a Bank account, deposit of money and withdrawal of money. Also generate a 4 digit unique code for each transaction.

13. Write a program to print next 5 days starting from today

14. Write a function that asks for an integer and prints square of it. Use a while loop with a try, except, else block to account for incorrect inputs