

OBJECTIVES:

The Student should be made to:

- Understand the basic concepts of PDE for solving standard partial differential equations
- Remember the concepts of fourier series for solving problems in engineering disciplines
- Applying the standard techniques for solving boundary value problem
- Analyze Fourier transform techniques used in wide variety of situations
- Evaluate the Z transform techniques for discrete time systems

UNIT I PARTIAL DIFFERENTIAL EQUATIONS 9+3

Formation of partial differential equations(single functions only) - Singular integrals -Solutions of standard types of first order partial differential equations(four types) - Lagrange's linear equation - Linear partial differential equations of second order with constant coefficients of homogeneous Equations.

UNIT II FOURIER SERIES 9+3

Dirichlet's conditions - General Fourier series - Odd and even functions - Half range sine series - Half range cosine series - Complex form of Fourier series - Parseval's identity - Harmonic analysis.

UNIT III FOURIER TRANSFORMS 9+3

Fourier transform pair - Fourier sine and cosine transforms - Properties - Transforms of simple functions - Convolution theorem - Parseval's identity.

UNIT IV APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS 9+3

Classification of PDE - Method of separation of variables - Fourier Series Solutions of one dimensional wave equation - One dimensional equation of heat conduction - Steady state solution of two dimensional equation of heat conduction.

UNIT V Z-TRANSFORMS AND DIFFERENCE EQUATIONS 9+3

Z-transforms - Elementary properties - Inverse Z-transform - Partial fraction - Convolution theorem (Statement and Examples) - Initial and final value theorems - Formation of difference equations - Solution of difference equations using Z-transform.

TOTAL: (45+15) PERIODS

OUTCOMES:

On successful completion of the course, the students will be able to,

- Understand suitable concepts in solving first order and second order partial differential equations with constant coefficients
- Identify the Fourier series for standard periodic waveforms
- Apply the solutions of wave and heat equations using Fourier series
- Analyze the properties and techniques of Fourier transforms
- Evaluate the necessary Z transform techniques to solve the difference equations


 CHAIRMAN
 BoS (S&H) 14/10

TEXT BOOKS:

1. Veerarajan T., "Transforms and Partial Differential Equations", 3rd Edition, Second reprint, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2017.
2. Grewal B.S., "Higher Engineering Mathematics", 43rd Edition, Khanna Publishers, Delhi, 2017.

REFERENCES:

1. Bali N.P and Manish Goyal, "A Text Book of Engineering Mathematics", Laxmi Publications(P) Ltd., 9th Edition, 2016.
2. Ramana B V, "Higher Engineering Mathematics", New Delhi Tata McGraw- Hill Education India Private Limited., 2018.
3. Glyn James, "Advanced Modern Engineering Mathematics", 4th Edition, Pearson Education, 2011.
4. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2011.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	3	-	-	2	-	2	-	-	2
CO2	3	2	2	-	-	2	-	2	-	-	2
CO3	3	3	3	2	-	2	-	2	-	-	2
CO4	3	2	2	-	-	1	-	2	-	-	2
CO5	3	2	3	2	-	1	-	2	-	-	2


CHAIRMAN
BoS (S&H)

14/10

OBJECTIVES:

The student should be made to:

- Integrate the individual functions of all the cells, tissues and organs into a functional whole human body.
- Identify the Bones, Joints and Functions and Muscular Movements.
- Emphasize the constituents of Blood, cardiovascular and respiratory system and its functions
- Outline the importance of digestion, absorption and mechanism of Urinary system
- Identify and classify the functions of nervous and various sensory organs of the human body

UNIT I BASIC ELEMENTS OF HUMAN BODY**9**

Cell – Cell Structure – Functions of components of cell. Cell membrane – Fluid mosaic model-transport across cell membrane – Action potential – Homeostasis - Cell Division -Tissue: Types, functions.

UNIT II SKELETAL AND MUSCULAR SYSTEM**9**

Skeletal: Types of Bone and function –Structure of long bone- Physiology of Bone formation – Division of Skeleton -Types of joints and function – Joint disorders - Types of cartilage and function. Muscular: Types of muscles –Functions- Muscle movements - Muscle contraction- Neuromuscular junction.

UNIT III CARDIOVASCULAR AND RESPIRATORY SYSTEM**9**

Blood: Components and Functions – Hematopoiesis - Haemostasis – Blood groups. Cardiovascular System: Structure of heart – Conduction System of heart – Cardiac Cycle and heart sounds. Lymphatic System: Lymphatic vessels - Lymph node - lymphoid organs - Respiratory system: Organs of respiratory system – Mechanism of breathing – Lung volumes and capacities – Gaseous exchange.

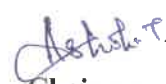
UNIT IV DIGESTIVE AND EXCRETORY SYSTEMS**9**

Digestive system: Organs of digestive system – digestion and absorption – Nutrition and metabolism – Krebs cycle. Urinary System: structure of kidney - nephron - mechanism of urine formation - Micturition- Maintaining water and electrolyte balance of blood.

UNIT V NERVOUS AND SENSORY SYSTEM**9**

Nervous tissue: Structure and function of cells of nervous system - Nerve conduction and synapse Brain - spinal cord – Reflex action – Somatic and Autonomic Nervous system. Eye: Structure - Physiology of Vision. Ear: structure - Physiology of Hearing. Integumentary – Structure of skin- Appendages of the skin.

TOTAL: 45 PERIODS


Chairman
BoS/BME 19/08/25

OUTCOMES:

On Successful completion of this course, students will be able to,

- Appreciate the functional importance of Cells, Tissues and Organs of Human Body
- Classify the types of Bones, Joints and Muscle characteristics
- Interpret the functions of the Blood, Heart, Lymphatic and Respiratory systems
- Extend the knowledge of digestion and urinary system to built artificial organs
- Translate the brain functions and sensory organs into appropriate wave patterns through appropriate instruments

TEXT BOOKS:

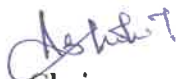
1. Elaine N Marieb,” Essential of Human Anatomy and Physiology” Tenth Edition, Pearson Education, 2013.

REFERENCES:

1. Guyton & Hall, “Text book of Medical Physiology”, 13th Edition, Saunders, 2015.
2. Ranganathan T S, “Text book of Human Anatomy”, S.Chand& Co. Ltd., New Delhi, 2012.
3. SaradaSubramanyam, K MadhavanKutty, Singh H D, “Textbook of Human Physiology”, OS. Chand and Company Ltd, New Delhi, 2012.

Mapping of COs with POs and PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	-	2	2	-	-	-	-	2	3	-
CO2	3	2	2	-	2	2	-	-	-	-	2	3	-
CO3	3	3	2	1	2	3	-	-	-	-	2	3	-
CO4	3	3	3	2	3	3	-	-	-	1	2	3	2
CO5	3	2	2	2	3	2	-	-	1	2	3	3	2


Chairman
BoS/BME

OBJECTIVES:

The student should be made to:

- Illustrate the principles, effects of ionizing and non-ionizing
- Interpret the physics of radiation sound, ultrasound interaction and its clinical applications
- Develop an understanding of the principles of radionuclides and its uses in medicine
- Organize the interaction of particles, X and Gamma radiation with matter
- Demonstrate the significance of dose measurement, detectors and counters

UNIT I IONIZING AND NON-IONIZING RADIATION

9

Electromagnetic spectrum - Generation of ionizing radiation – Production of X-rays - Linear accelerator - Tele-isotope - Absorption, Scattering and Attenuation of Gamma-rays –Biological effects and Protection. Non ionizing radiation: Physics of light - Intensity of light - Tissue as a leaky dielectric - Low Frequency Effects- Higher frequency effects.

UNIT II SOUND IN MEDICINE

9

Physics of sound - Normal sound levels - Ultrasound fundamentals - Generation of ultrasound (Ultrasound Transducer), Interaction of Ultrasound with matter- Cavitations, Reflection, Transmission, Scanning methods, Artifacts, Ultrasound- Doppler effect, Clinical Applications

UNIT III PRINCIPLES OF RADIOACTIVE NUCLIDES

9

Radioactive Decay: Spontaneous Emission – Isometric Transition – Gamma ray emission, alpha, beta, Positron decay, electron capture. - Radionuclide used in Medicine - Decay series: Half-life and Mean life - Decay equation. Production of radionuclides: Cyclotron - Reactor produced - fission and neutron capture reaction - radionuclide Generator-Technetium generator

UNIT IV INTERACTION OF RADIATION WITH MATTER

9

Interaction of charged particles with matter –Specific ionization, Linear energy transfer range, Bremsstrahlung, Annihilation, Interaction of X and Gamma radiation with matter- Photoelectric effect, Compton Scattering, Pair production, Attenuation of Gamma Radiation, Interaction of neutron with matter and their clinical significance

UNIT V RADIATION DOSE AND DETECTORS

9

Dose and Exposure measurements – Units (SI), Inverse square law, Maximum permissible exposure, relationship between the dosimetric quantities. Measurement Methods: Principles of Gas-Filled Detectors - Ionization chambers - Geiger–Müller Counters - Scintillation counters - Film dosimeters - Thermo luminescent dosimetry(TLD). Scintillation Detectors: Solid Scintillation Counters - Gamma-Ray Spectrometry - Liquid Scintillation Counters - Gamma Well Counters-Thyroid Probe.

TOTAL: 45 PERIODS
Chairman

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OUTCOMES:

On Successful completion of this course, students will be able to,

- Interpret the properties of electromagnetic radiations and its effect on human.
- Demonstrate the knowledge on the properties of sound and its application in medicine.
- Apply the principles and understand the production of radioactive nuclides.
- Explain the interaction of radiation with matter.
- Identify and analyze the radiation quantities and methods of measuring

TEXT BOOKS:

1. B.H. Brown, R.H. Smallwood, D.C. Barber, P.V. Lawford, D.R. Hose, "Medical Physics and Biomedical Engineering", Institute of physics publishing, Bristol and Philadelphia, 1999.
2. Gopal B. Saha "Physics and Radiobiology of Nuclear Medicine" Fourth edition Springer, 2006.

REFERENCES:

1. W.J. Meredith and J.B. Massey "Fundamental Physics of Radiology" Varghese Publishing house, Third Edition, 2013.
2. Steve Webb, The Physics of Medical Imaging, Taylor & Francis, Newyork, Second Edition, 2012.
3. R.S. Khandpur, "Handbook of Biomedical Instrumentation", Tata McGraw-Hill, New Delhi, 2003.

Mapping of COs with POs and PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	-	3	1	-	-	-	-	2	3	-
CO2	3	3	2	2	3	1	-	-	-	-	2	3	-
CO3	3	3	2	2	3	1	-	-	-	-	2	3	-
CO4	2	2	2	1	2	3	2	-	1	1	2	2	-
CO5	2	2	2	2	2	3	2	1	2	2	3	3	2


Chairman
BoS/BME

24EC201 ELECTRIC CIRCUITS AND ELECTRON DEVICES
(Common to ECE and BME)

L T P C
3 0 0 3

OBJECTIVES:

Student should be made to

- Understand the basic electrical quantities, circuit elements, and fundamental laws governing electrical circuits.
- Able to simplify electrical circuits using various network theorems and two-port parameter concepts.
- Learn the behavior of RL, RC, and RLC circuits under transient conditions using Laplace transform techniques.
- Provide insights into semiconductor diodes, their characteristics, and applications in electronic circuits.
- Explore the working principles of BJTs, JFETs, and MOSFETs, along with their role in amplification and switching circuits

UNIT I BASIC CIRCUIT ANALYSIS 9

Electrical Quantities -Basic Circuit Elements -Independent Voltage and Current Sources - Ohm's Law- Kirchhoff's Laws -Voltage and Current Division, Source Transformation Star Delta Conversion- Mesh analysis and Nodal analysis for DC Circuits - Fundamentals of AC Circuits.

UNIT II NETWORK THEOREMS AND TWO PORT NETWORKS 9

Network Theorems for DC Circuits: Thevenin's Theorem Norton's Theorem- Superposition Theorem Maximum Power Transfer Theorem Two Port Networks: Z Parameters – Y Parameters - h Parameters - Relationships between Network Parameters (Z, Y, h).

UNIT III TRANSIENT RESPONSE ANALYSIS 9

Introduction to Laplace transform for step, impulse and periodic functions-Transient Response of RL, RC and RLC Circuits using Laplace transform for DC input and AC sinusoidal input.

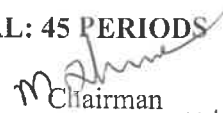
UNIT IV SEMICONDUCTOR DIODES AND DEVICES 9

Classification of Semiconductors – PN Junction Diode -Structure, Operation and V-I characteristics -Diode Current equation -Transition and Diffusion Capacitances Zener Diode LED-Photodiode-Solar Cell -UJT-SCR.

UNIT V TRANSISTORS 9

Bipolar Junction Transistor: Construction of BJT-Operation of NPN and PNP transistor - Input and Output characteristics of CB, CE, CC configuration- Field Effect transistor: JFET P Channel JFET and N Channel JFET Construction, Operation, Drain and Transfer characteristics MOSFET Depletion MOSFET and Enhancement MOSFET - Construction, Operation and characteristics.

TOTAL: 45 PERIODS


Chairman
BoS(ECE) 19/08/25

OUTCOMES:

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

- Recognize fundamental circuit laws and theorems to solve DC electrical circuits.
- Illustrate the use of Thevenin's, Norton's, and Superposition theorems for circuit simplifications.
- Interpret the behavior of RL, RC, and RLC circuits under DC and AC inputs using Laplace Transform techniques.
- Examine the characteristics and functions of diodes, Zener diodes, LEDs, photodiodes, solar cells, and thyristors.
- Categorize the working principles, characteristics, and applications of BJTs, JFETs, and MOSFETs in different circuit configurations.

TEXT BOOKS:

1. S. Salivahanan, "Circuit Theory Analysis and Synthesis", Pearson Education, 1st Edition, 2021.
2. S. Salivahanan, "Electronic Devices", Tata McGraw Hill, 1st Reprint Edition, 2014.

REFERENCES:

1. Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Sathesis", 5th Edition, McGraw Hill, 2015.
2. Chakrabarti A, "Circuit Theory (Analysis and synthesis), Revised Edition, Dhanpath Rai & Sons, New Delhi, 2017.
3. Balbir Kumar, Shail. B. Jain, "Electronic devices and circuits", 2nd Edition PHI learning private limited, 2014.
4. David A. Bell, "Electronic devices and circuits", 5th Edition, Oxford University Higher education, 2008.
5. Sedra and Smith, "Microelectronic circuits", 7th Edition, Oxford University Press, 2017
6. Thomas L. Floyd, "Electronic devices" Conventional current version, 10th Edition, Pearson prentice hall, 2017.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	2	2	1	1	-	-	-	2
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CO4	3	2	1	1	-	1	1	-	-	-	2
CO5	3	2	1	1	-	1	1	-	-	-	2


Chairman
BoS(ECE)

OBJECTIVES:

The student should be made to:

- Apply the principles of magnetic circuits and transformer operation to analyze the electromagnetic behaviour.
- Illustrate the constructional and operational principles of DC machines to determine their performance.
- Assess the principles of AC and special electrical machines to determine their effectiveness in control and instrumentation systems
- Employ electrical safety standards and protective device principles to design safe and reliable hospital electrical systems.
- Implement power system fundamentals and safety protocols to ensure reliable power delivery and patient protection in a clinical setting.

UNIT I MAGNETIC CIRCUITS AND TRANSFORMERS 9

Ampere's law - Magnetic quantities- Series and parallel magnetic circuits - Magnetic materials and B-H relationship - Electromagnetic induction - Self and mutual induction- Losses in magnetic circuits. Transformer: Construction and operation of single-phase transformer - Ideal transformer- Autotransformer.

UNIT II DC MACHINES 9

DC Machines: Construction, Principle of operation, armature windings, EMF equation, Torque equation, Operation of a DC machine as a generator and motor - Characteristics of DC generators and motors.

UNIT III AC MACHINES AND SPECIAL MACHINES 9

Three phase induction motor: Construction, principle of operation. Single phase induction motor: Construction, working principle and types. Synchronous Generator: Construction, Principle of operation, Synchronous motor: principle and operation. Servomotor- Stepper Motor.

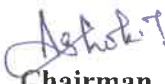
UNIT IV ELECTRICAL SAFETY DEVICES FOR HOSPITALS 9

Two-way and three-way control, Elementary discussion on circuit protective devices - Fuse and Miniature Circuit Breaker (MCB's), Electric shock, precautions against shock, Objectives for neutral and earthing, Types of earthing - Pipe and Plate earthing, Residual current circuit breaker.

UNIT V ELECTRICAL POWER SYSTEM AND PATIENT SAFETY 9

Introduction - Power generation, Distribution and Transmission, Power tariffs, Power supply circuits with SMPS, UPS, Electric Shock Hazards, Leakage Currents, Electrical Safety Analyser, Testing of biomedical equipment, Transducers for body temperature measurements.

TOTAL: 45 PERIODS


Chairman

BoS/BME 19/08/25

OUTCOMES:

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

- Demonstrate the application of magnetic circuit analysis, and transformer principles to assess electromagnetic induction and its functionality
- Analyze the construction, equations, and operational characteristics of DC generators and motors to evaluate their suitability for varied load conditions
- Solve application-based problems involving induction motors and synchronous machines by applying their functional principles.
- Recommend appropriate protective devices and earthing practices to ensure electrical safety and prevent shock hazards in healthcare.
- Interpret power systems, safety mechanisms and biomedical equipment testing procedures to enhance patient safety in hospital settings.

TEXT BOOKS:

1. Kothari D P and Nagrath I J, "Basic Electrical and Electronics Engineering", 3rd Reprint, McGraw Hill Education (India) Private Limited, 2016.
2. Gupta J B, "A course in Power Systems", S K Kataria and Sons, 2016.

REFERENCES:

1. B.L.Theraja, "A Textbook of Electrical Technology", S Chand and Company- Reprint Edition, 2014.
2. V.K Mehata, Rohit Mehta, "Principles Electrical Engineering and Electronics", 2nd edition, S Chand and Company, 2015.
3. R. S. Khandpur, "Handbook of Biomedical Instrumentation", 3rd edition, McGraw Hill Education (India) Private Limited, 2023.

Mapping of COs with POs and PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	-	3	1	-	-	-	-	2	3	-
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CO3	3	3	2	2	3	1	-	-	-	-	2	3	-
CO4	2	2	2	1	2	3	2	-	1	1	2	2	-
CO5	2	2	2	2	2	3	2	1	2	2	3	3	2


Chairman
BoS/BME

OBJECTIVES:

The Student should be made to:

- Acquire knowledge about the fundamentals of Python language
- Learn to solve problems using Python conditionals , loops and use functions to solve problems
- Apply Python data structures - lists, tuples and dictionaries to represent complex data
- Enhance the knowledge in GUI Programming
- Build application that handles files and exceptions

UNIT I INTRODUCTION TO PYTHON 9

Programming Languages - Python History - Getting Started with Python - Writing a Simple program - Reading input from console - Identifiers - Variables - Simultaneous Assignments - Constants - Data Types and Operators - Operator Precedence - Evaluating expressions - Augmented Assignment operators - Type conversion - Common Python Functions - Strings and Characters - Formatting Numbers and Strings.

UNIT II CONTROL STATEMENTS AND FUNCTIONS 9

Selections: if - Two way if-else - Nested if and multi-way if-elif-else Statements - Loops: while - for - Nested Loops - break and continue - Function: Definition - Calling and Returning values - Positional and keyword arguments - Passing arguments by reference values - Scope of variables - Default Arguments - Recursion.

UNIT III DATA STRUCTURES IN PYTHON 9

List Basics - List Methods - Passing List to Functions - Returning a List from function - Tuples - Sets - Comparing Sets and Lists - Dictionaries.

UNIT IV GUI PROGRAMMING USING PYTHON 9

Introduction - Getting started with TKinter - Processing Events - The widget Classes - Canvas - The Geometry Managers. Combo Boxes - Menus - Pop-up menus - Mouse, key, Events and Bindings. Case Study: Bouncing Balls - Scrollbars - Standard Dialog Boxes.

UNIT V FILES AND EXCEPTION HANDLING 9

Introduction - Text Input and Output - File Dialogs - Retrieving Data from the Web - Exception Handling - Raising Exceptions - Processing Exception using Exception Objects.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Understand the basics of python programming languages
- Apply basic Python programs that solve issues by utilizing loops and conditionals
- Demonstrate compound data using Python lists, tuples and dictionaries etc
- Implement solutions using GUI Programming in Python
- Develop programs by using files and exception handling for the given scenario


CHAIRMAN
BoS (AD)

26/11

TEXT BOOKS:

1. Y.Daniel Liang, "Introduction to Python Programming and Data Structures", 3rd Edition Pearson Education, 2023.

REFERENCES:

1. Timothy A. Budd, "Exploring Python", McGraw Hill Education (India) Private Ltd, 2017.
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Updated for Python 3, Shroff / O'Reilly Publishers, 2016. (<http://greenteapress.com/wp/think-python/>)
3. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach", Pearson India Education Services Pvt. Ltd., 2016.
4. Mark Lutz, "Learning python", O'Reilly Publication, 5th Edition, 2013.
5. Guido Van Rossum and Fred L. Drake Jr, "An Introduction to Python", Revised and Updated for Python 3.2, Network Theory Ltd., 2011.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	3	2	-	-	-	2	-	-	3
CO2	3	3	3	3	3	-	-	-	-	2	-
CO3	3	2	3	-	-	-	-	2	-	-	2
CO4	3	2	3	-	2	-	-	2	-	-	3
CO5	3	2	3	-	-	-	-	2	-	-	2



CHAIRMAN
BoS (AD)

OBJECTIVES:**The student should be made to:**

- Identify and understand the various parts of a compound microscope.
- Comprehend the principles behind blood grouping and Rh factor
- Estimate the coagulation pathways and the role of various factors in the clotting process
- Classify the constituents of blood and measure the quantity
- Analyze the visual and hearing levels of a human

LIST OF EXPERIMENTS:

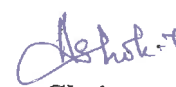
1. Study of compound microscope.
2. Identification of Blood groups (Forward and Reverse)
3. Measurement of Bleeding and Clotting time of blood.
4. Prothrombin time Activated partial thromboplastin time and Fibrinogen time.
5. Estimation of Hemoglobin
6. Calculation of total RBC & WBC count.
7. Differential count of Blood cells
8. Estimation of ESR, PCV, MCH, MCV, MCHC
9. Testing the Hearing levels using Tuning fork.
10. Visual Activity – Snellen's Chart and Jaeger's Chart

TOTAL: 30 PERIODS**OUTCOMES:****On successful completion of this course, the students will be able to,**

- Demonstrate various parts of a compound microscope and know how to operate
- Identify the types of blood group, Rh type and its significance
- Examine the bleeding time & clotting time of blood
- Identify the RBC, WBC along with its quantity and compare it with nominal value
- Infer the efficiency of visualization and hearing sensory organs

Mapping of COs with POs and PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	2	3	2	-	-	-	-	2	3	-
CO2	3	2	2	1	2	3	-	-	-	-	2	3	-
CO3	3	2	2	2	2	3	-	-	-	-	2	3	-
CO4	3	3	2	2	3	3	-	-	-	-	2	3	2
CO5	3	2	2	2	3	2	-	-	1	2	3	3	2


Chairman
 BoS/BME 19/08/25

24EC202L

CIRCUITS AND DEVICES LABORATORY
(Common to ECE and BME)

L P T C
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OBJECTIVES:

The student should be made to:

- Learn and verify the voltage and current in the electrical circuit using Kirchhoff's laws.
- Apply circuit analysis concepts using network theorems.
- Analyze the operation of RLC circuits in series and parallel models.
- Evaluate the characteristics, behavior under varying conditions, and practical applications of diodes and transistors in electronic circuits and devices.
- Create a project using electronic components.

LIST OF EXPERIMENTS:

1. Verification of KVL and KCL
2. Verification of Thevinin's and Norton's Theorem
3. Verification of Super Position Theorem
4. Verification of Maximum Power Transfer Theorem
5. Simulation and Verification of Reciprocity Theorem
6. Determination of Resonance Frequency of Series and Parallel RLC Circuits
7. Characteristics of PN Junction Diode and Zener Diode
8. Input-Output Characteristics of CE Configuration
9. Simulation of LED Characteristics
10. Characteristics of FET
- 11 Characteristics of SCR
- 12 Mini Project

TOTAL: 45 PERIODS


Chairman
BoS(ECE) 19/02/25

OUTCOMES:

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

- Contrast Kirchhoff's laws to verify the voltage and current
- Determine the network theorems allows for the efficient solution of voltage, current or resistance in complex circuits.
- Illustrate the operation of RLC circuits in series and parallel models enables the analysis of resistive, inductive and capacitive components
- Implement the characteristics of semiconductor diodes and transistors
- Demonstrates the ability to design, assemble, and troubleshoot electronic circuits, showcasing problem-solving skills and practical application of electronic principles.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	1	1	-	2	-	2	2	-	1
CO2	3	3	2	1	2	2	-	2	2	-	1
CO3	2	2	3	2	-	2	-	2	2	1	1
CO4	2	2	3	2	2	2	-	2	2	1	1
CO5	2	1	2	1	-	2	-	2	2	2	1


Chairman
BoS(ECE)

Lab Requirement for a Batch of 30 Students

1	BC 107, BC 148, BFW10	25 Each
2	1N4007, SCR, Zener diodes	25 Each
3	Resistors, Capacitors, Inductors	Adequate Quantities
4	Digital Multimeter	10 Nos
5	Bread Boards	15 Nos
6	Voltmeter (0-15) V, (0-10)V	10 Nos
7	Ammeter (0-20) mA, (0-250) μ A	10 Nos
8	CRO (30MHz)	10 Nos.
9	Function Generators (3 MHz)	10 Nos
10	Dual Regulated Power Supplies (0 – 30V)	15 Nos
11	Standalone desktops PCs with Multisim Software (Equivalent to any open-source Software)	15 Nos


CHAIRMAN
BoS (ECE) 07/02/25

OBJECTIVES:**The Student should be made to:**

- Use control statements and operators in Python programs
- Create python programs using functions and strings
- Represent compound data using Python lists, dictionary and set
- Build python GUI Application with Tkinter
- Design python applications to handles files and exceptions

LIST OF EXPERIMENTS:

1. Python Program to constructs conditional statements.
2. Python Program to implement operators and built in functions.
3. Python Program to performing string operations.
4. Python Program to find the factorial of a number by using functions.
5. Python Program to manipulating the elements on list.
6. Python Program to develop a fundamental data structures in programming using dictionary and set.
7. Python program to Controlling Layout with Geometry Managers.
8. Python Program to display the calendar of the year with GUI using Tkinter.
9. Python Program to perform count the number of words in a file.
10. Python Program to implement exception handling.

TOTAL: 45 PERIODS**OUTCOMES:****On successful completion of this course, the students will be able to,**

- Solve the problems using control statements and operators in python
- Construct python program using strings and functions
- Design Python lists, dictionary and set to represent compound data
- Apply Tkinter to develop GUI Application
- Develop python programs using file and exception handling

List of Equipment for a Batch of 30 Students:

Standalone desktops with Python 3 interpreter for Windows/Linux 30 Nos.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	3	2	2	-	-	2	-	-	-
CO2	3	3	3	2	-	-	-	2	-	-	-
CO3	3	2	2	-	-	-	-	2	-	-	-
CO4	3	3	3	-	2	-	-	2	-	-	2
CO5	3	3	3	-	2	-	-	2	-	-	2


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26/11

OBJECTIVES:

The students should be made to:

- Enhance the development of students by focusing on soft skills
- Develop skills of the students through individual and group activities
- Shape students' attitude and behaviour through activities
- Analyze the characteristics of the students for self-development
- Prepare themselves for the recruitment processes

UNIT I SOFT SKILLS ARE IMPORTANT FOR SUCCESS**6**

Importance of Soft Skills - Types - Industrial needs - Development of skills – Employees' expectation - Success of employees.

UNIT II CORPORATE COMMUNICATION**6**

Needs and Development of Communication - Customers Relationship - Improving informal communication - Formation of presentations - Public Speaking - Telephone and Email Etiquettes.

UNIT III DISCUSSIONS**6**

Introduction to Discussion - Importance and types of discussion - Spontaneous conversation - Plan for discussions - Panel discussions - Visual Aid discussions - Debate.

UNIT IV SELF ANALYSIS**6**

Who am I - Identifying or searching one's own Strength, Weakness - Opportunities and Threats (SWOT Analysis) - Benefits of SWOT Analysis - Importance of Self Confidence, Self Esteem, Self Development and Self Introspection.

UNIT V CREATIVITY AND GOAL SETTING**6**

Thinking out of the box - Lateral thinking - Positive thinking - Results of smart work - Application of creativities - Short Term and Long Term Goals - Lifetime goals.

TOTAL: 30 PERIODS**OUTCOMES:**

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

- Learners will recognize the importance of Soft skills in Professional life.
- Improve oral and Listening Skills.
- Enhance students' ability in GDs, Presentations and interviews.
- Develop one's strength in setting of goals and developing creative.
- Become a good team worker in the society.


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TEXT BOOKS:

1. "SOFT SKILLS", Career Development Centre, Green Pearl Publications, 2015.

REFERENCES:

1. Covey Sean, "Seven Habits of Highly Effective Teens", New York, Fireside Publishers, 1998.
2. Carnegie Dale, "How to win Friends and Influence People", New York: Simon & Schuster, 1998.
3. Jeff Butterfield, "Soft Skills for Everyone", Cengage Learning, 2011.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	2	2	-	2	2	-	-
CO2	-	3	-	3	2	-	3	2	2	2	2
CO3	2	-	-	-	3	-	2	3	2	2	2
CO4	2	-	2	-	-	2	-	3	2	3	-
CO5	-	3	2	1	-	2	2	3	2	-	-


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