

E.G.S.PILLAYENGINEERINGCOLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai Accredited
by NAAC with „A“ Grade | Accredited by NBA (CSE, EEE, MECH, ECE, CIVIL, IT)

NAGAPATTINAM–611002



B.E. Biomedical Engineering

FullTime Curriculum and Syllabus

Second Year– Third Semester

Course Code	CourseName	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1901MA301	Engineering Mathematics III (Linear Algebra and Vector Calculus)	3	2	0	4	40	60	100
1902CS306	Object Oriented Programming and Data Structures	3	0	0	3	40	60	100
1902BM301	Fundamentals of Biochemistry	3	2	0	3	40	60	100
1902BM302	Bio medical Circuits and Networks	3	0	0	4	40	60	100
1902BM303	Biosensors and Measurements	3	0	0	3	40	60	100
1902BM304	Human Anatomy and Physiology	3	0	0	3	40	60	100
Laboratory Course								
1902BM351	Devices and Circuits Laboratory	0	0	4	2	50	50	100
1902BM352	Biochemistry and Human Physiology Laboratory	0	0	4	2	50	50	100
1902CS353	C++ and Data Structures Laboratory	0	0	4	2	50	50	100
1904GE351	Life Skills: Soft Skill	0	0	2	1	100	-	100
Total		18	4	12	27	490	510	1000
Audit Course								
1901MCX02	Constitution of India	0	0	0	0	0	0	0

L–Lecture|T–Tutorial|P–Practical|C–Credit|CA –ContinuousAssessment| ES–EndSemester

1901MA301

**ENGINEERING MATHEMATICS III
(LINEAR ALGEBRA AND VECTOR
CALCULUS)**

L T P C

3 2 0 4

COURSE OBJECTIVES:

1. To introduce the effective mathematical tools for the solutions of partial differential equations that model physical processes;
2. To introduce Fourier series analysis which is central to many applications in engineering .
3. To understand the classifications of Partial Different Equations and its applications.
4. To introduce the Fourier transforms and Theorem
5. To develop Z- transform techniques which will perform the same task for discrete time systems as Laplace Transform, a valuable aid in analysis of continuous time systems.

UNIT I PARTIAL DIFFERENTIAL EQUATIONS 12 Hours

Formation of partial differential equations – Singular integrals — Solutions of standard types of first order partial differential equations , Lagrange’s linear equation — Linear partial differential equations of second order with constant coefficients of homogeneous type.

UNIT II FOURIER SERIES 12 Hours

Dirichlet’s conditions – General Fourier series , Odd and even functions – Half range sine series – Half range cosine series – Parseval’s identity – Harmonic analysis.

UNIT III APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS 12 Hours

Classification of PDE – Solutions of one dimensional wave equation , One dimensional equation of heat conduction , Steady state solution of two dimensional equation of heat conduction.

UNIT IV FOURIER TRANSFORMS 12 Hours

Statement of Fourier integral theorem – Fourier transform pair , Fourier sine and cosine transforms , Properties, Transforms of simple functions – Convolution theorem , Parseval’s identity

UNIT V Z – TRANSFORMS AND DIFFERENCE EQUATIONS 12 Hours

Z - transforms – Elementary properties, Inverse Z – transform (using partial fraction and residues) ,Convolution theorem – Formation of difference equations, Solution of difference equations using Z – transform.

Total: 60 Hours

FURTHER READING:

1. Linear partial differential equations of higher order
2. Solution of non-homogeneous partial differential equations

COURSE OUTCOMES:

After completion of the course, Student will be able to

1. Compute the solution of partial differential equations (K2)
2. Use Fourier series analysis which is central to many applications in engineering (K2)
3. Solve boundary value problem using partial differential equation.(K3)
4. Apply Fourier transform techniques used in wide variety of situations.(K3)
5. Apply Z transform techniques for discrete time systems. (K3)

TEXT BOOK:

1. Veerarajan. T., “Transforms and Partial Differential Equations”, Second reprint, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012.
2. Ray Wylie. C and Barrett.L.C, "Advanced Engineering Mathematics" Tata Mc Graw Hill Education Pvt Ltd, Sixth Edition, New Delhi, 2012.

REFERENCES:

1. Peter V.O’Neil, “Advanced Engineering Mathematics”, Cengage Learning India Pvt., Ltd, New Delhi, 7th Edition, 2012.
2. Grewal. B.S., “Higher Engineering Mathematics”, 42nd Edition, Khanna Publishers, Delhi, 2012.
3. Datta.K.B., "Mathematical Methods of Science and Engineering", Cengage Learning India Pvt Ltd, Delhi, 2013.
4. Ramana.B.V., “Higher Engineering Mathematics”, Tata Mc-Graw Hill Publishing Company Limited, New Delhi, 2008.
5. nptel.ac.in/courses/111105035, www.nptelvideos.in/2012/11/Mathematics.html

1902CS306

**OBJECT ORIENTED PROGRAMMING AND
DATA STRUCTURES**

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To comprehend the fundamentals of object oriented programming, particularly in C++.
2. To understand the concepts of Inheritance and Polymorphism in Object oriented programming
3. To use object oriented programming to implement data structures.
4. To develop Non linear data structures using tree and graphs.
5. To introduce linear, non-linear data structures and their applications.

UNIT I DATA ABSTRACTION & OVERLOADING

9Hours

Overview of C++ – Structures ,Class Scope and Accessing Class Members, Reference Variables ,Initialization ,Constructors, Destructors – Member Functions and Classes – Friend Function , Dynamic Memory Allocation , Static Class Members , Container Classes and Integrators , Proxy Classes , Overloading: Function overloading and Operator Overloading.

UNIT II INHERITANCE & POLYMORPHISM

9Hours

Base Classes and Derived Classes – Protected Members ,Casting Class pointers and Member Functions, Overriding – Public, Protected and Private Inheritance , Constructors and Destructors in derived Classes – Implicit Derived , Class Object To Base – Class Object Conversion, Composition Vs. Inheritance – Virtual functions – This Pointer , Abstract Base Classes and Concrete Classes , Virtual Destructors , Dynamic Binding.

UNIT III LINEAR DATA STRUCTURES

9 Hours

Abstract Data Types (ADTs) – List ADT, array-based implementation , linked list implementation, singly linked lists – Polynomial Manipulation - Stack ADT ,Queue ADT ,Evaluating arithmetic expressions

UNIT IV NON-LINEAR DATA STRUCTURES

9 Hours

Trees – Binary Tree, Binary search trees ,Tree traversal -Expression manipulation , Symbol table construction , AVL trees: Rotation, Insertion, Deletion,–Red black tree – Graph and its representations – Graph Traversals – Representation of Graphs - Breadth-first search , Depth-first search ,Connected components.

UNIT V SORTING And SEARCHING

9 Hours

Sorting Techniques-Selection, Bubble, Insertion, Merge, Heap, Quick, and Radix sort -Address calculation - Linear search ,Binary search ,ash table methods.

Total:

45 Hours

FURTHER READING:

B-Trees, Splay trees
Floyd - Warshall algorithm.

COURSE OUTCOMES:

After completion of the course, Student will be able to

1. Identify the model of Abstract Data Type, calculation of algorithm efficiency and designing of recursive algorithms.
2. Design algorithms to solve real life problems using data structures.
3. Analyze various sorting and searching algorithms.
4. Recognize the usage of Non-Linear Data structures such as Binary Search tree, AVL search tree and Heap tree in applications.
5. Solve real life problems using minimum spanning tree and shortest path algorithms.

TEXT BOOKS:

1. Data Structures Using C++, Second Edition D.S. Malik, 2010
2. Goodrich, Michael T., Roberto Tamassia, David Mount, “Data Structures and Algorithms in C++”, 7th Edition, Wiley. 2016.

REFERENCES:

1. Bhushan Trivedi, “Programming with ANSI C++, A Step-By-Step approach”, Oxford University Press, 2010.
2. Deitel and Deitel, “C++, How To Program”, Seventh Edition, Pearson Education, 2013. 2007.
3. Ellis Horowitz, Sartaj Sahni and Dinesh Mehta, “Fundamentals of Data Structures in C++”, Galgotia Publications,
4. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, Fourth Edition, Addison-Wesley, 2013.

1902BM301

FUNDAMENTALS OF BIOCHEMISTRY

L	T	P	C
3	2	0	3

COURSE OBJECTIVES:

1. To understand about the functioning of physiological system.
2. To analyse the biochemical reactions and the various methods to analyze them.
3. To know the significance of bio molecules in biological systems.
4. To give an introduction about the clinical diseases
5. To understand the concepts of Enzymes and Kinetics.

UNIT I INTRODUCTION TO BIOCHEMISTRY

9 Hours

Biomolecules, structure of water & its importance – Important non covalent forces – Hydrogen bonds, electrostatic, hydrophobic & vanderwaals forces – Acid, base & buffers – pH, Henderson Hassel Balch equation. Biological buffers and their significance – Principle of viscosity – surface tension, adsorption, diffusion, osmosis & their applications in biological systems.

UNIT II BIOENERGETICS

9 Hours

High energy compounds - electronegative potential of compounds, respiratory chain - ATP cycle, Calculation of ATP during oxidation of glucose and fatty acids. DNA-RNA, Proteins, Lipids, Carbohydrates.

UNIT III MACROMOLECULES, VITAMINS, HORMONES, ENZYMES

9 Hours

Physical and chemical properties- structure of hemoglobin: immunoglobulin and nucleoprotein, classification and their properties, occurrence, functions, requirements, deficiency manifestations and role of vitamins as coenzyme, chemical nature and properties, hormones, Nomenclature - enzyme kinetics- classification and their properties, mechanism of action, enzyme induction and inhibition, coenzyme significance and enzymes of clinical importance.

UNIT IV CLINICAL DISEASES

9 Hours

Diabetes mellitus- insulin dependent diabetes mellitus, non-insulin dependent diabetes mellitus, measurement of HbA1c levels-atherosclerosis, fatty liver, and obesity- hormonal disorders, aging, inborn errors of metabolism organ function tests

UNIT V ENZYME AND ITS KINETICS

9 Hours

Classification of enzymes: apoenzyme, coenzyme, holoenzyme and cofactors. Kinetics of enzymes -Michaelis, Menten equation. Factors affecting enzymatic activity: temperature, pH, substrate concentration and enzyme concentration. Inhibitors of enzyme action- Competitive, non-competitive, irreversible. Enzyme- Mode of action, allosteric and covalent regulation. Clinical significance of enzymes. Measurement of enzyme activity and interpretation of units.

Total:

45 Hours

FURTHER READING:

1. Study metabolic pathways in pathological conditions.
2. Assess the significance of bio molecules in biological systems.
3. Analyze the etiology and biological parameters in metabolic diseases.

COURSE OUTCOMES:

After completion of the course, Student will be able to

1. Comprehend and appreciate the significance and role of this course in the present contemporary world.
2. They will generate and test hypotheses, analyze data using statistical methods where appropriate, and appreciate the limitations of conclusions drawn from experimental data.
3. Students will analyze the pathological conditions like obesity, Diabetes mellitus, atherosclerosis, fatty liver, and hormonal disorders, aging.
4. Students will be able to understand and compare the Physical and chemical properties and structure of hemoglobin, immunoglobulins and nucleoprotein.
5. Students will analyze the clinical significance of enzyme activity.

TEXT BOOKS:

1. Lehninger A.L., Nelson D.L. and Cox M.M. Principles of Biochemistry. CBS publishers and distributors, 2010
2. Thomas M. Devlin. Textbook of Biochemistry with clinical correlations. Wiley Liss Publishers David L. Nelson, Michael M. Cox, Lehninger —Principles of Biochemistry| Macmillan, 6th edition 2013.

REFERENCES:

1. Murray R.K., Granner D.K., Mayes P.A. and Rodwell V.W. Harpers Biochemistry. Appleton and Lange, Stanford, Connecticut, 2012
2. Keith Wilson and John Walker, —Practical Biochemistry – Principles & Techniques — Oxford University press, 7th Edition, 2010.

1902BM302

**BIO MEDICAL CIRCUITS AND
NETWORKS**

L	T	P	C
3	0	0	4

COURSE OBJECTIVES:

1. Ability in identifying passive and active circuit elements/components and basic knowledge on their operation and application.
2. To prepare the students to have a basic knowledge in the analysis of Electric Networks
3. To understand and solve the given circuit with various theorems and methods and to distinguish between tie set and cut set methods for solving various circuits.
4. To gain knowledge about coupled circuits.
5. In depth knowledge in Integral & Differential Calculus and fundamental knowledge on Laplace Theorem & its inverse.

UNIT I Mesh Current and Network Analysis 9 Hours

Kirchhoff's Voltage Law- Formulation of Mesh Equations- Solution of mesh equations by Cramer's rule and matrix method, Driving point impedance, Transfer impedance.

UNIT II Nodal analysis of circuits 9 Hours

Graph of Network: Concept of Tree Branch, Tree link, junctions, Incident matrix, Tie-set matrix, Cutset matrix, determination of loop current and node voltages.

UNIT III Resonant Circuits 9 Hours

Series and Parallel Resonance, Impedance and Admittance Characteristics -Quality Factor, Half-Power Points, Bandwidth, Resonant voltage rise, Transform diagrams

UNIT IV Network Analysis 9 Hours

.Kirchhoff's Current Law- Formulation of node equations and solutions- Driving point admittance, Transfer admittance, Solutions of Problems with DC and AC sources. Definition and implications of Superposition Theorem, Thevenin's Theorem- Norton's Theorem- Reciprocity Theorem- Compensation Theorem- Maximum Power Transfer Theorem- Millman's Theorem, Star-Delta transformations, Solutions and Problems with DC and AC sources.

UNIT V Coupled Circuits 9 Hours

Magnetic Coupling- polarity of coils, polarity of induced voltage, concept of self and mutual inductance, coefficient of coupling, Solution of Problems Circuit Transients- DC Transient in R-L & R-C circuits with and without initial charge, R-L-C circuits, AC transients in sinusoidal RL, R-C, & R-L-C circuits.

Total: 45 Hours

FURTHER READING:

Understand, Describe and Analyze the Transients in electrical networks and solve related problems. Apply Laplace Transform and form Transfer Function for different kinds of electrical networks for analyzing them and solve related problems

COURSE OUTCOMES:

After completion of the course, Student will be able to

1. Understand, Describe, Analyze and Design series and parallel RLC circuits and solve related problems.
2. Analyze circuits using Node Voltage & Mesh Current Analysis in electrical networks and solve related problems.
3. Apply and Analyze Network Theorems to electrical networks to evaluate network parameters in simplified ways.
4. 4. Understand, Describe, Analyze and Design Graph and Trees for a given network and build network matrices and solve related problems
5. Understand Describe, Analyze and Design Coupled (Magnetic and Electromagnetic) Circuits and solve related problems.

TEXT BOOKS:

1. Electric Circuits and Networks - a text book written by Suresh Kumar K S., Published by Pearson Education ISBN:9788131713907 Pages: 840
2. Circuit Theory and Network by S.p.Ghosh and A.K. Chakraborty,2011

REFERENCES:

1. Neamen Donald A., Electronics Ckt. Analyzer & Design, 2nd ed., Tata McGraw Hill.
2. Boylestad Robert L., Nashelsky Louis, Electronics Devices & Circuits, Pearson Education.
3. Circuits and Networks.,U.A.Bakshi, A.V.Bakshi,Technical publications,2011.
4. M.S.Sukhija&T.K.NagSarkar- Circuits and Networks-Oxford

1902BM303

BIOSENSORS AND MEASUREMENTS

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To Understand the Units and Standards of measurements for various physical quantities and how to use the measurement for calibration and error analysis.
2. To analyze the Characteristics of the Transducer using their models and Responses.
3. To make an experiment on various Resistance type transducer using their principle of operation and Applications.
4. To gain knowledge about Bio Sensors and their Applications.
5. To acquire the knowledge of other special Transducer.

UNIT I SCIENCE OF MEASUREMENT

9 Hours

Units and Standards - calibration methods, static calibration. classification of errors- error analysis, statistical methods - odds and uncertainty

UNIT II CHARACTERISTICS OF TRANSDUCERS

9 Hours

Static characteristics - accuracy, precision, sensitivity, linearity. mathematical model of transducers – zero, first order and second - order transducers - response to impulse step, ramp and sinusoidal inputs

UNIT III VARIABLE RESISTANCE TRANSDUCERS

9 Hours

Resistance Potentiometer - Principle of operation, construction details, characteristics and applications - strain gauges- resistance thermometers- thermistors- hot-wire anemometer and humidity sensors.

UNIT IV BIOSENSORS - PHYSIOLOGICAL RECEPTORS

9 Hours

Type of Bio Sensor - Chemoreceptors, Baroreceptors, Touch receptors, Biosensors - Working Principle and Applications

UNIT V SPECIAL TRANSDUCERS

9 Hours

Piezoelectric transducers, magnetostrictive transducer, IC sensor digital transducers - smart sensor - fibre optic transducers- Introduction to MEMS and Nano Sensors

Total:

45 Hours

FURTHER READING:

1. Bio receptors and Bio detectors
2. DNA Sequencing with nano pores

COURSE OUTCOMES:

After completion of the course, Student will be able to

1. Explain the Science of Measurement and Error Analysis
2. Identify the characteristics of transducers and its Responses
3. Experiment with Variable Resistance Transducers and their Applications.
4. Describe the working function of Different types of Bio Sensors and their applications
5. Explain the working principles of special Transducers.

TEXT BOOKS:

1. L.A Geddes and L.E.Baker, „Principles of Applied Biomedical Instrumentation“ Third Edition, – John Wiley and sons, Reprint 2008.
2. Albert D. Helfrick and William D. Cooper. “Modern Electronic Instrumentation and Measurement Techniques”, Prentice Hall of India, 2007.

REFERENCES:

1. S.M. Sze, “Semiconductor Sensors,” New York, 1994, John Wiley & Sons.
2. L. Ristic, “Sensor Technology and Devices,” 1994, Artech House, Inc.

1902BM304

HUMAN ANATOMY AND PHYSIOLOGY

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. Know basic structural and functional elements of human body.
2. Learn organs and structures involving in system formation and functions.
3. Understand all systems in the human body.
4. Gain knowledge about sensory system
5. Better understanding of fluid maintenance

UNIT I BASIC ELEMENTS OF HUMAN BODY

9 Hours

Cell- Structure and organelles , Functions of each component in the cell. Cell membrane – transport across membrane , Origin of cell membrane potential . Tissue- Types ,Specialized tissues , functions.

UNIT II RESPIRATORY SYSTEM AND URINARY SYSTEM

9 Hours

Respiratory System- Components of respiratory system , Respiratory Mechanism, Types of respiration , Oxygen and carbon dioxide transport and acid base regulation. Urinary system: Structure of Kidney and Nephron. Mechanism of Urine formation , Urinary reflex , Homeostasis and blood pressure regulation by urinary system. Digestive system: Structure of Digestive system-Parts of Digestive system- Digestive process.

UNIT III BLOOD AND CARDIOVASCULAR SYSTEM

9 Hours

Blood composition - functions of blood , functions of RBC, WBC types and their functions Blood groups , importance of blood groups , identification of blood groups. Blood vessels - Structure of heart – Properties of Cardiac muscle , Conducting system of heart , Cardiac cycle , Heart sound , Volume and pressure changes and regulation of heart rate ,Coronary Circulation. Factors regulating Blood flow.

UNIT IV SKELETAL AND SPECIAL SENSORY SYSTEM

9 Hours

Skeletal system: Bone types and functions , Axial Skeleton and Appendicular Skeleton. Joint - Types of Joint ,Cartilage structure, types and functions. Special Sensory system- Eye, Ear and Skin - diseases and related surgery.

UNIT V NERVOUS SYSTEM

9 Hours

Structure of a Neuron – Types of Neuron. Neuroglial Cells , Synapses and types. Brain – Divisions of brain lobes , Cross Sectional Anatomy of Brain, Cortical localizations and functions. Spinal cord – Tracts of spinal cord , Spinal Nerve , Reflex mechanism – Types of reflex, Autonomic nervous system and its functions.

Total:

45 Hours

FURTHER READING:

1. To determine hemoglobin count in the blood by Sahli's method.
2. In-vitro recognition of A, B, O blood groups by slide test.
3. To find the total Red Blood Cell count using Neubauer'shaemocytometer.
4. To find the total White Blood Cell count using Neubauer'shaemocytometer.
5. To study ECG Machine

COURSE OUTCOMES:

After completion of the course, Student will be able to

1. Describe basic structural and functional elements of human body.
2. Explain gaseous exchange and fluid maintenance in the human body.
3. Enlighten organs and structures involving in system formation and functions.
4. Identify all systems in the human body.
5. Elucidate special senses in the human body.

TEXT BOOKS:

1. Eldra Pearl Solomon. "Introduction to Human Anatomy and Physiology", W.B.Saunders Company, 2003.
2. Frank H.Netter, "Atlas of human anatomy", Netter basic science, 7th edition 2019.

REFERENCES:

1. William F. Ganong, "Review of Medical Physiology", Mc Graw Hill, New Delhi, 25th Edition, 2015.
2. Arthur C. Guyton, "Text book of Medical Physiology", Elsevier Saunders, 11th Edition, 2006
3. Elaine.N. Marieb, "Essential of Human Anatomy and Physiology", Pearson Education New Delhi, 8th Edition, 2007.

1902BM352

**BIOCHEMISTRY AND HUMAN PHYSIOLOGY
LABORATORY**

L T P C
0 0 4 2

Course Objectives:

1. Estimation and quantification of bio molecules.
2. Separation of macromolecules.
3. Interpreting the metabolic changes in pathological conditions.
4. To learn about Hemoglobin
5. Study of anatomy using software

List of Experiments:

1. Study of Human anatomy with A.D.A.M interactive online software
2. Absorption Spectrum of Hemoglobin
3. Bleeding time and clotting time
4. Preparation of serum and plasma from blood
5. Estimation of ESR , PCV, MCH , MCV total count of RBCs and hemoglobin estimation
6. Estimation of creatinine
7. Estimation of urea
8. Estimation of cholesterol
9. Separation of amino acids by thin layer chromatography
10. Separation of DNA by agarose gel electrophoresis

Total: 45 Hours

Additional Experiments:

1. Measurement of pH of solutions using pH meter. Weber's and Rinne —s test for auditory conduction.
2. Ishihara chart for color blindness and Snellen's chart for myopia and hyperopia - by letters reading and ophthalmoscope to view retina

Course Outcomes:

After completion of the course, Student will be able to

1. Use basic laboratory skills and apparatus to obtain reproducible data from biochemical experiments.
2. Separate and analyze the importance of macromolecules.
3. To gain knowledge about Hemoglobin estimation
4. Estimation of cholesterol , urea, blood glucose levels
5. Separation of amino acids and DNA using different methods

Text Book:

1. Keith Wilson and John Walker, —Practical Biochemistry – Principles & Techniques — Oxford University press, 7th Edition, 2010.

References:

2. Pamela.C.Champeand Richard. A. Harvey —Biochemistry Lippincott's Illustrated Reviews. Lippincott-Raven publishers, 6th Edition, 2013.
3. Arthur C. Guyton, "Text book of Medical Physiology", Elsevier Saunders, 11th Edition, 2006

1902BM351

DEVICES AND CIRCUITS LABORATORY

L T P C

Course Objectives:

1. Be exposed to RL and RC circuits
2. Be familiar with Thevenin & Norton theorem KVL & KCL, and Super Position Theorems
3. To Know about series, parallel resonance circuits, Amplifiers and Multivibrators
4. To observe the characteristics of diodes
5. To design oscillator and multivibrator

List of Experiments:

1. Verification of ohm's law, Kirchhoff's law, and Thevenin's theorem
2. Verification of superposition theorem and Maximum power transfer theorem
3. Rectifier - Half wave rectifier & Full wave rectifier
4. Forward and reverse characteristics of PN junction diode
5. Forward and reverse characteristics of zener diode
6. Characteristics of CE Bipolar Junction transistor
7. Characteristics of CB Bipolar Junction transistor
8. Characteristics of JFET & UJT
9. Design of RC Phase shift oscillator
10. Design of multivibrator

Additional Experiments:

1. Design and Analysis of Differential Amplifier
2. Design of RC Oscillators and LC Oscillators

Course Outcomes:

After completion of the course, Student will be able to

1. Design RL and RC circuits
2. Verify Thevenin & Norton theorem KVL & KCL, and Super Position Theorems
3. Have a better understanding of diodes
4. Analyze different characteristics of transistor
5. Design Oscillator, rectifier and multivibrator

Text Books:

1. Electric Circuits and Networks - a text book written by Suresh Kumar K S., Published by Pearson Education ISBN:9788131713907 Pages: 840

References:

1. Muhammad H. Rashid, "Microelectronic Circuits: Analysis and Design", Cengage Learning, 6th Edition, 2013.
2. Robert L. Boylestad, "Electronic Devices and Circuit Theory", 11th Edition, 2015.
3. Robert B. Northrop, "Analysis and Application of Analog Electronic Circuits to Biomedical Instrumentation", CRC Press, 2004.