



NEW PRINCE SHRI BHAVANI ARTS AND SCIENCE COLLEGE

(Co - Educational & Affiliated to University of Madras)

PATEL ROAD, MEDAVAKKAM, CHENNAI - 600100.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION SCIENCE

B.Sc (Electronics and Communication Science)

PROGRAM OUTCOMES (POs):

- Skills and knowledge to excel the graduates professional in Electronics and Communication Science and related disciplines. To build up basic problem solving skills through organizing available information and applying circuit laws.
- Graduates will contribute and communicate effectively with in the team to grow in to leaders. Graduates will practice lifelong learning for continuing professional development.
- Graduates will develop strong problem solving skills by effectively formulate a circuit problem in to a mathematical problem using laws and theorems. Graduates will have the capability to continue their formal education and successfully complete an advanced degree.
- Graduates will contribute to the growth of the nation and society by applying acquired knowledge in technical, computing and managerial skills.
- To prepare the student to apply the principles and techniques learnt as a form of working model.

PROGRAM SPECIFIC OUTCOMES (PSOs):

- Understand the concepts of key areas in Electronics and Communication Science. Familiarize the student with the analysis and design of basic electronic devices.
- The necessary technical, scientific as well as basic managerial and financial procedures to analyze and solve real world problems within their work domain.
- Apply technical and professional skills to excel in bussiness. Acquiring basic knowledge about the fundamentals of microprocessor, Antenna, analysis of various colour television system, terminology of computer networks.

Year:I

Semester:I

Subject: Basic Circuit Theory

Subject Code: TAG1A

Course Objectives

- To solve simple circuits using ohm's law, Kirchhoff's laws and the properties of the elements , basic problem solving skills through organizing available information and applying circuit laws , circuits using series and parallel equivalents and using Thevenin and Norton equivalents , circuit theorems to simplify and find solutions to electrical circuits.

Course Outcomes

- Students will be able to explain basic circuit concepts and responses
- Students Will be able to explain the concepts of capacitance and inductance and the concepts of two terminal linear devices.
- Students Will be able to explain the complete response of R-L & RC transient circuits.
- Students will be able to study circuit theorems to simplify and find solutions to electrical circuits.
- Students will be able to study circuits using series and parallel equivalents and using Thevenin and Norton equivalents.

Year:I

Semester:I

Subject: History of Electronics

Subject Code: SNG1A

Course Objective:

- To understand the basic circuit concepts and responses, the analytical techniques in resistive circuits energized by direct current voltage and current sources

Course Outcomes :

- Students will be able to explain basic circuit concepts and responses.
- Students Will be able to use analytical techniques in resistive circuits energized by direct current voltage and current sources.
- Students will be able to apply the techniques and concepts in their daily life.

Year: I

Semester: I

Subject: Main Practicals - I

Subject Code: TAG11

Course Objective:

- Provide hands-on experience to the students so that they are able to put theoretical concepts to practice , the concept of circuit laws , the concept of resistors and capacitors in series and parallel circuits , multimeters, power supplies, signal generators, and oscilloscopes.

Course Outcomes:

- Students will be able to Provide hands-on experience to the students so that they are able to put theoretical concepts to practice.
- Students will be able to Understand the concept of circuit laws.
- Students will be able to Understand the concept of resistors and capacitors in series and parallel circuits.
- Students will be able to use basic laboratory equipment and techniques to measure electrical quantities using laboratory test equipment such as multimeters, power supplies, signal generators, and oscilloscopes.

Year: I

Semester: II

Subject: Basic Electronics

Subject Code: TAG2A

Course Objectives

- To familiarize the student with the analysis and design of basic transistor amplifier circuit , the fundamentals of special purpose diodes , the fundamentals of operation of the main semiconductor electronic devices , the operation of transistors as switching circuits , the tools and techniques of practical electronics and circuit design.

Course Outcomes

- Students will be able to explain the functioning of various solid-state devices.
- Students will be able to explain the functioning of several types of diodes (conventional, zener, and light-emitting)
- Students will understand the theory of operation of bi-polar junction transistors
- Students will understand the theory of operation of field-effect transistors.
- Students will understand the basic concepts of bonding and study of conductors, insulators, semiconductors

Year: I

Semester: II

Subject: Trends in personal computer

Subject Code: SNG2E

Course Objectives:

- To introduce the fundamentals of computing devices and reinforce computer vocabulary, particularly with respect to personal use of computer hardware and software, the Internet, networking and mobile computing.

Course Outcomes:

- Students can able to describe the usage of computers and why computers are essential components in business and society
- Students can Utilize the Internet Web resources and evaluate on-line e-business system
- Students can be able to solve common business problems using appropriate Information Technology applications and systems.

Year: I

Semester: II

Subject: Main Practicals - II

Subject Code: TAG21

Course Objective:

- To study basic electronic components and to observe characteristics of electronic devices, the characteristics of electronic devices to understand their behaviour, construct and test amplifier circuits and interpret the results, Operate electronic test equipment and hardware tools to characterize the behavior of devices and circuits.

Course Outcomes :

- Students can able to understand the basic electronic components and to observe characteristics of electronic devices.
- Students will be able to understand the characteristics of electronic devices to understand their behavior.
- Students will be able to understand the Design, construct and test amplifier circuits and interpret the results.
- Students will be able to Operate electronic test equipment and hardware tools to characterize the behavior of devices and circuits

Year: II

Semester: III

**Subject: Electricity, Magnetism and
Electromagnetism**

Subject Code: TAG3A

Course Objectives

- To familiarize the student to the concepts, calculations pertaining to electric, magnetic and electromagnetic fields so that an in depth understanding of antennas, electronic devices, Waveguides is possible, the relation between the fields under time varying situations , principles of propagation of uniform plane waves.

Course Outcomes:

- The capability to calculate forces between charge distribution.
- The capability to calculate mathematical expressions for magnetic field.
- The ability to compute voltage, current impedance & power along 2 conductors.
- Students will be able to understanding of antennas, electronic devices, Waveguides.
- Students will be able to apply the concepts, calculations pertaining to electric, magnetic and electromagnetic fields.

Year:II

Semester:III

Subject: Amplifiers and Oscillators

Subject Code: TAG3C

COURSE OBJECTIVES:

- To study the operation of Push-Pull Amplifier, the operations and the applications of the various classes of an Amplifier , the effect on Input Impedance and Frequency on Common Emitter Amplifier
- To Learn about the operation of Hartley, Colpitts, RC Phase shift, crystal and wien bridge oscillators, the operating characteristic of Unijunction Transistor Oscillator.

COURSE OUTCOMES:

- Be able to understand the operations and the applications of the various classes of an Amplifier.
- Be able to study the operation of Push-Pull Amplifier.
- Be able to familiarize the student with the analysis and design of basic transistor amplifier circuits,
- Be able to design feedback amplifiers, wave shaping and multi vibrator circuits.
- Be able to study the effect on Input Impedance and Frequency on Common Emitter Amplifier.

Year:II

Semester:III

Subject: Basic physics - I

Subject Code: TBG3A

Course Objective:

- To understand the fundamental laws and their applications in measuring many physical quantities ,basic principles and fundamentals of Physics , Physics principles can be applied to the development ofTechnology.

Course Outcomes :

- Learn the basics of properties of matter, how Young's modulus and rigidity modulus are defines and how they are evaluated for different shapes of practical relevance
- Learn the fundamentals of harmonic oscillator model, including damped and forced oscillators and grasp the significance of terms like quality factor and damping coefficient
- Study the general equation of wave motion in general and TM waves in stretched strings and longitudinal waves in gases
- Students will be able to learn , Physics principles that can be applied to the development of Technology.
- Familiarise with general terms in acoustics like intensity, loudness, reverberation etc, and study in detail about production, detection, properties and uses of ultrasonic waves.

Year:II

Semester:III

Subject: Main Practicals - III

Subject Code: TAG31

Course Objective:

- To Apply compensation techniques for stabilizing analog circuits against parameter variations , Design and analyze multistage amplifiers, Analyze and design solid state power amplifier circuits , Design negative feedback amplifier circuits and oscillators.

Course Outcome :

- Students can able to use Design and analyze multistage amplifiers.
- Students will be able to understand the compensation techniques for stabilizing analog circuits against parameter variations.
- Students can able to use Design negative feedback amplifier circuits and oscillators.
- Students can able to analyze and design solid state power amplifier circuits.
- Students can able to analyze and design tuned amplifier circuits.

Year:II

Semester:IV

Subject: Principles of communication

Subject Code: TAG4A

Course Objective:

- To learn the basic principles of analog and digital communication systems, common modulation schemes for continuous wave modulation including amplitude modulation, frequency modulation, and phase modulation , common digital pulse modulation schemes including delta, the common analog pulse modulation schemes including pulse- amplitude modulation, pulse-width modulation, and pulse-position modulation.

Course Outcomes :

- Students can able to use different modulation and demodulation techniques used in analog communication.
- Students can able to Identify and solve basic communication problems.
- Students can able to analyze transmitter and receiver circuits.
- Students can able Compare and contrast design issues, advantages, disadvantages and limitations of analog communication systems
- Students will be able to understand the concepts of the basic principles of analog and digital communication systems, common modulation schemes for continuous wave modulation including amplitude modulation, frequency modulation, and phase modulation .

Year:II

Semester:IV

Subject: Digital Electronics

Subject Code: TAG4C

Course Objective:

- To understand common forms of number representation in digital electronic circuits , decimal, octal, hexadecimal, and binary conversions , Boolean algebra to solve logic functions , simple logical operations using combinational and sequential logic circuits .

COURSE OUTCOMES

- Be able to manipulate numeric information in different forms
- Be able to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
- Be able to design and analyze small combinational circuits and to use standard combinational functions to build larger more complex circuits.
- Students will be able to solve , logic functions , simple logical operations using combinational and sequential logic circuits
- Be able to design and analyze small sequential circuits and to use standard sequential functions to build larger more complex circuits

Year:II

Semester:IV

Subject: Basic Physics - II

Subject Code: TBG4A

Course Objective:

- To understand the concepts of Ultrasonics, laser beam emitters, fundamental laws and their applications in measuring many physical quantities.

Course Outcomes :

- Understand basic physical concepts and vocabulary used to describe the electricity and magnetism, optics, atomic and nuclear physics.
- Apply conceptual understanding of the physics to general real-world situations.
- Students will be able to understand the applications of fundamental physics.
- Students will be able to learn about the concepts of Ultrasonics, laser beam emitters
- Apply the mathematical tools developed in Physics to various quantum mechanics problems.

Year:II

Semester:IV

Subject: Main Practicals – IV

Subject Code: TAG41

Course Objective:

- Learn the basics of gates , combinational circuits and verify their functionalities , counters , the design procedures to design basic sequential circuits , the basic digital circuits and to verify their operation.

Course Outcomes:

- Students will be able to learn the basics of gates.
- Students will be understand the basic combinational circuits and verify their functionalities
- Students will be able to use design procedures to design basic sequential circuits
- Students will be able to learn about counters , Shift registers.
- Students will be able to understand the basic digital circuits and to verify their operation.

Year:II

Semester:IV

Subject: Allied Basic Physics Practicals

Subject Code: TBG41

Course Objective:

- Determine the selectivity parameters in electrical circuits , the width of narrow slits, spacing between close rulings using lasers and appreciate the accuracy in measurements , Hares apparatus,torsional pendulum, spectrometer, polarimeter and GM counter for making measurements.

Course Outcomes:

- Students will be able to use Hares apparatus,torsional pendulum, spectrometer, polarimeter and GM counter for making measurements
- Students will be able to understand the Test optical components using principles of interference and diffraction of light
- Students will be able to understand the determine the selectivity parameters in electrical circuits
- Students will be able to understand the width of narrow slits, spacing between close rulings using lasers and appreciate the accuracy in measurements

Year:III

Semester:V

Subject: Microprocessor

Subject Code: TAG5A

Course Objective:

- To illustrate some basic concepts of microprocessors through the use of assembly language programming , the microprocessor as a programmable digital system element , the operation of microprocessors and machine language programming & interfacing techniques

Course Outcomes:

- The student will be able to analyse, specify, design, write and test assembly language programs of moderate complexity.
- The student will be able to select an appropriate ‘architecture’ or program design to apply to a particular situation
- The student will be able to calculate the worst-case execution time of programs or parts of programs.
- The student will be able to understand . the various peripheral interface circuits that are necessary for the operation of Intel-8085.
- The student will be able to understand the operation of microprocessors and machine language programming & interfacing techniques

Year:III

Semester:V

**Subject: Antennas and Television
Engineering**

Subject Code: TAG5B

Course Objective:

- To provide To describe the electromagnetic radiation with application to antenna theory and design , the basic knowledge about the fundamentals of antenna, the radio wave propagation phenomena in modern communication systems .

COURSE OUTCOMES :

- Be able To provide the basic knowledge about the fundamentals of antenna.
- Be able To describe the electromagnetic radiation with application to antenna theory and design.
- Be able To make the students understand the radio wave propagation phenomena in modern communication systems.
- Be able To understand the applications of the electromagnetic waves in free space.
- Be able To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver Picture tubes and television cameras.

Year:III

Semester:V

**Subject: Electrical and Electronics
Instrumentation**

Code: TAG5B

Course Objective:

- To study the basics of design of analog and digital circuits used in electronic instrumentation , basic electronic instrument terminology , the proper application of electronic instruments , the basic concepts related to the operation of Electrical and Electronic Measuring Instruments

Course Outcomes:

- Describe the working of various electrical and electronics meters.
- Describe the working of digital meters currently in use.
- Distinguish between the analog and digital meters.
- Relate and apply the appropriate measuring techniques to real time applications.
- Students will be able to understand the basic concepts related to the operation of Electrical and Electronic Measuring Instruments

Year:III

Semester:V

Subject: Medical Electronics

Code: TEGAE

Course Objective

- To study about equivalent circuit of an electrode use of differential instrumentation ,diagnostic use of the ECG , basic concepts of Bio amplifiers , the principles of physiological principles behind the usefulness of measuring the blood pressure , types of electrodes used - different lead systems - their waveforms.

Course Outcomes :

- Students will be able to Demonstrate measuring of basic medical parameters.
- They will be able to Calculate basic parameters of the equipment for using in electro diagnostic and electro therapy.
- Students learnt the principles of physiological principles behind the usefulness of measuring the blood pressure.
- Students understood the concepts of types of electrodes used - different lead systems - their waveforms.
- They Recommend problem solving and service procedures for electrical equipment.

Year:III

Semester:V

Subject: Main Practicals – V

Subject Code: TAG51

Course Objectives:

- To become familiar with the architecture and Instruction set of Intel 8085 microprocessor , practical hands on experience with Assembly Language Programming, the students with interfacing of various peripheral devices with 8085 microprocessor , ADC and DAC modules with microprocessor based system.

Course Outcomes:

- Students will become familiar with the architecture and Instruction set of Intel 8085 microprocessor.
- Students will be understand the practical hands on experience with Assembly Language Programming.
- Students will get familiarized with interfacing of various peripheral devices with 8085 microprocessor.
- Students will be able to use the Interface ADC and DAC modules with microprocessor based system.

Year:III

Semester:VI

Subject: Microcontroller

Code: TAG6A

Course Objective:

- To know 8051 microcontroller in detail, different types of Microcontroller , Programming and Interfacing with 8051 microcontroller , an in-depth understanding of the operation of microcontrollers & interfacing techniques , use various IO devices such as keypads, stepper motor, A to D and D to A converters.

Course Outcomes :

- Be able to Familiarize with different types of Microcontroller.
- Be able to know 8051 microcontroller in detail.
- Be able to learn Programming and Interfacing with 8051 microcontroller.
- Be able to develop an in-depth understanding of the operation of microcontrollers & interfacing techniques.
- Be able to Understand and use various IO devices such as keypads, stepper motor, A to D and D to A converters

Year:III

Semester:VI

Subject: Advanced Electronics

Code: TAG6B

Course Objective:

- To be familiar with recent trends in optoelectronics , the fundamentals of optoelectronics and principles of the optoelectronic devices operation , the basic concepts of smart phones , the fundamental concepts of nanoelectronics

Course Outcomes :

- Students will be able to explain Optoelectronic components
- Students will be able to explain nanoelectronics concepts.
- Students will be able to perform basic fabrication methods.
- Students will be able to explain smart phones techniques.
- Students will be to understand the fundamental concepts of Nanomaterials

Year:III

Semester:VI

Subject: Industrial Electronics

Code: TEGAB

Course Objective:

- Learn about the latest electronic devices available in industry , industrial control devices , power distribution equipment and requirements.

Course Outcomes:

- Learn about the latest electronic devices available in industry.
- Students will be able to understand the applications of electronics in industry.
- Be able to effectively provide detailed explanation to the structure and operation of common linear components.
- Use tools/test equipment to analyze electronic components.

Year:III

Semester:VI

Subject: Main Practicals – VI

Subject Code: TAG61

Course Objective:

- Design and implement 8051 microcontroller based systems , the concepts related to I/O and memory interfacing , the fundamentals of assembly level programming of microprocessors and microcontroller , test and measurement equipment to evaluate digital interfaces.

Course Outcomes:

- Students will be able to design and implement 8051 microcontroller based systems.
- Students will be able to understand the concepts related to I/O and memory interfacing
- Students will be able to understand and apply the fundamentals of assembly level programming of microprocessors and microcontroller.
- Students will be able to use standard test and measurement equipment to evaluate digital interfaces.

Year:III

Semester:VI

Subject: Project & Viva voce

Subject Code: TAG6Q

Course Objective:

- To be able to apply some of the techniques/principles you have been taught , out budget and time management for the project, electronic hardware implementation skills by learning PCB artwork design using an appropriate EDA tool , trouble-shooting of the project.

Course Outcomes:

- Students will be able to apply some of the techniques/principles you have been taught
- Students will be able to carry out budget and time management for the project.
- Students will be able to inculcate electronic hardware implementation skills by learning PCB artwork design using an appropriate EDA tool.
- Students will be able to follow correct grounding and shielding practices
- Students will be able to understand the effective trouble-shooting of the project.