



VIVEKANANDA COLLEGE

TIRUVEDAKAM WEST, MADURAI DISTRICT - 625 234, TAMIL NADU

Vision & Mission and PEOs, PSO's & POs

DEPARTMENT OF PHYSICS

Choice Based Credit System (CBCS)

and

**Learning Outcomesbased Curriculum Framework
(LOCF)**

DEPARTMENT OF PHYSICS

Vision

- ❖ Inculcating the basic and up to date knowledge in physical science to the first generation students from rural areas – by student centered learning methods and a mixture of traditional, current, and integrative pedagogical techniques
- ❖ The department has dedicated itself for a lifelong learning through academic and social programs

Mission

- ❖ Prepare the student in assets of physics and the principles of analytical methods required for the competitive physics tests in the competitive world
- ❖ Kindle the knowledge of students to pursue higher studies and research programs. Making the students self employable with the Physics knowledge gained during their degree course of study
- ❖ To provide the tools and skills for advancing our knowledge about the universe and for providing solutions to challenges we face as individuals, communities, and societies

Programme Educational Objectives (PEOs)

A Graduate of B.Sc. Physics programme after three years will be

PEO1	Utilising the physics concepts in the day to day life for better living. Applying the physics theories in the work places and homes to make better decision and choice.
PEO2	Succeed in obtaining employment appropriate to their interests, education and will become a valuable physicist
PEO3	Technical Proficiency- Succeed in obtaining employment appropriate to their interests, education and will become valuable physicist.
PEO4	Professional Growth-Continue to develop professionally through life-long learning, higher education, research and other creative pursuits in their areas of specialization.
PEO5	Management Skills-Improve leadership qualities in a technical and social response through innovative manner.

Programme Outcomes (POs)

On completion (after three years) of B.Sc. Physics programme, the students are expected to

P.No.	Programme Outcome	Description
PO1	Disciplinary Knowledge and Critical Thinking	Take informed actions after identifying the assumptions that frame our thinking and actions, checking out degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from perspectives.
PO2	Effective Communication and Digital Literacy	Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
PO3	Social Interaction and Problem Solving	Elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO4	Effective Citizenship and Social Responsibility	Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering and life training.
PO5	Professional Ethics and Human Values	Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO6	Environment and Sustainability	Understand the issues of environmental contexts and Sustainable development.
PO7	Self –directed and life – long learning	Acquire the ability to engage in independent and life – long learning in the broadest context socio- technological changes

Programme Specific Outcomes (PSOs)

At the end of the programme the student will

PSO1	Gain a wide spectrum of skills which will enable them to solve both theoretical and experimental problems.
PSO2	Secure jobs in the field of Education, and in industries which require scientific knowledge.
PSO3	Understanding the importance of renewable and non renewable energy and its applications.
PSO4	Acquire the skill to gauge the physical properties of materials.
PSO5	Be able to make effective use of ICT tools.

Course Outcomes (Cos)

Part III : Core Theory	Course Code: 06CT11
Course Title : MECHANICS	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Know the basic concept of Kinematics, acceleration and Newton's laws of motion	K1, K2, K3
CO 2	Understanding two and three dimensional motions	K1, K2, K3
CO 3	Applying conservation of momentum in particle system	K1, K2, K3
CO 4	Define and applications of angular momentum, angular velocity and force	K1, K2, K3
CO 5	Know about the basic concepts of fluids and its applications	K1, K2, K3

K1- Remembering **K2** – Understanding **K3** – Applying

Part III : Core Theory	Course Code: 06CT12
Course Title : ELECTROMAGNETISM	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Know the basic concept of charge, Super position Principle, Electric Field, Gauss's law, Coulomb's theorem and applications electric Field	K1, K2, K3
CO 2	Understanding the potential Difference, relation between Electric field and Electric Potential, capacitors, Types and applications of capacitors	K1, K2, K3
CO 3	Define and applications of Ohms law	K1, K2, K3
CO 4	Applying the magnetic induction using Biot - Savat Law and Ampere's circuital law for Hemholtz Tangent Galvanometer, Ballistic Galvanometer.	K1, K2, K3
CO 5	Discuss the basic concept of LCR series and parallel resonant circuit and ac & dc motors	K1, K2, K3

K1- Remembering **K2** – Understanding **K3** – Applying

Part III : Core Theory	Course Code: 06CT21
Course Title : THERMODYNAMICS & STATISTICAL MECHANICS	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Outline the heat transmission and black body spectrum	K1,K2,K3
CO 2	Understanding the behavior of real gases	K1, K2,K3
CO 3	Applying laws of thermodynamics in day to day life	K1, K2,K3
CO 4	Understanding the basic concept of Maxwell laws and its applications	K1 ,K2,K3
CO 5	Know the need of quantum statistics	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Core Theory	Course Code: 06CT22
Course Title : OPTICS AND SOUND	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Know the basic concept of Total Internal Reflection, The Doppler effect, interference and its application	K1, K2,K3
CO 2	Understanding the Diffraction, types and its application	K1, K2,K3
CO 3	Define and applications of Polarization	K1, K2,K3
CO 4	Applying the Oscillating systems to natural phenomena	K1, K2,K3
CO 5	Discuss the Properties of Sound Waves	K1, K2,K3

K1- Remembering

K2 – Understanding

K3 – Applying

Part III : Core Theory	Course Code: 06CT31
Course Title : PRINCIPLES OF ELECTRIC CIRCUITS	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Know the different combinations of resistive circuits and network theorems	K1, K2,K3
CO 2	Understanding the concept of alternating current and voltage and complex numbers	K1, K2,K3
CO 3	Analyse the RC circuit for ac	K1, K2,K3
CO 4	Analyse the RL circuit for ac	K1, K2,K3
CO 5	Analyse and Applying ac to RLC resonance and passive filters	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Core Theory	Course Code: 06CT32
Course Title : SPECTROSCOPY	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Know the basic concepts of various atom models	K1, K2,K3
CO 2	Understanding the different quantum numbers and dipole moments	K1, K2,K3
CO 3	Analyse the rotational spectrum of various types of molecules	K1, K2,K3
CO 4	Applying infrared spectroscopy to harmonic and anharmonic oscillators	K1, K2,K3
CO 5	Analyse and Applying Raman spectroscopy to various types of molecules	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Core Theory		Semester – IV
Course Title : ANALOG ELECTRONICS		
Course Code: 06CT41	Hours Per Week : 4	Credit: 4
CIA Marks : 25	ESE Marks : 75	Total Marks : 100

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Know the basic concepts of Junction diode and Zener diode	K1, K2,K3
CO 2	Understanding the characteristics of BJT and JFET	K1, K2,K3
CO 3	Analyse the Transistor circuits as amplifier	K1, K2,K3
CO 4	Applying Transistor circuit as oscillators and Understanding the basics of op-amp	K1, K2,K3
CO 5	Analyse and Applying AM in communication system	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Core Theory	Course Code: 06CT42
Course Title : NUMERICAL METHODS	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	To find the roots of transcendental equations by different methods	K ₁ ,K ₂ ,K ₃
CO 2	Understanding the solutions of linear algebraic equations	K ₁ ,K ₂ ,K ₃
CO 3	Analyse the importance of interpolation in different fields	K ₁ ,K ₂ ,K ₃
CO 4	Applying familiar with the numerical differentiation and integration by various methods	K ₁ ,K ₂ ,K ₃
CO 5	Analyse the solution of ordinary differential equations	K ₁ ,K ₂ ,K ₃

K1- Remembering

K2-Understanding

K3-Applying

Part III : Core Theory	Course Code: 06CT51
Course Title : SOLID STATE PHYSICS	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Understanding various crystal structures and familiarize with different X-ray diffraction methods	K1, K2,K3
CO 2	Recognize different types of imperfections in crystals	K1, K2,K3
CO 3	Understanding dielectric properties of materials	K1, K2,K3
CO 4	Familiarize with different types of magnetic materials and their applications	K1, K2,K3
CO 5	Understanding the basic concepts of superconductivity and its applications	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Core Theory	Course Code: 06CT52
Course Title : DIGITAL ELECTRONICS	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	To learn the Digital Electronic fundamentals and circuits such as Number system and Codes, Combinational circuits and Data Processing circuits	K1, K2,K3
CO 2	To know more about Arithmetic circuits, Clocks and Timing circuits	K1, K2,K3
CO 3	To gain in-depth knowledge about Flip-flops, Registers and Counters, A/D and D/A convertors	K1, K2,K3
CO 4	To gain knowledge about Communication systems and Types of Modulation	K1, K2,K3
CO 5	To learn about Microprocessor, Arithmetic operators like Addition and Subtraction	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Elective Theory	Course Code: 06EP51
Course Title : OBJECT ORIENTED PROGRAMMING WITH C++	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Learn the most widely used OOP language, the need, principles and applications of OOP.	K1, K2,K3
CO 2	Know about the basic concepts like Tokens, Expressions, Control structures and Functions in C++.	K1, K2,K3
CO 3	Familiarize the concepts such as Classes and Objects	K1, K2,K3
CO 4	Understanding about Constructors, their types, Destructors, Operator overloading and Type conversions	K1, K2,K3
CO 5	Learn salient features as Inheritance, its types and Virtual Base Class.	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Core Theory	Course Code: 06CT61
Course Title : NUCLEAR PHYSICS	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Understanding nucleus, its structure, detectors of nuclear radiation and particle accelerators	K1, K2,K3
CO 2	Expose of radioactivity, range and its measurements	K1, K2,K3
CO 3	Expand knowledge about artificial transmutation of elements and Classification of neutron	K1, K2,K3
CO 4	Study more about nuclear fission and fusion and nuclear reactors	K1, K2,K3
CO 5	Understanding about the Elementary particles	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Elective Theory	Course Code: 06EP61
Course Title : QUANTUM MECHANICS & RELATIVITY	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Understanding the Particle Properties of Waves and the photoelectric effect	K1, K2,K3
CO 2	Study the properties of Waves though de Broglie wave	K1, K2,K3
CO 3	Familiarize with Schrodinger's Wave equation and to Applying for simple models.	K1, K2,K3
CO 4	Study the Postulates of quantum mechanics and the free particle and the square well in three dimensions	K1, K2,K3
CO 5	Understanding the theory of relativity and to Applying for length contraction, time dilation and variation of mass.	K1, K2,K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Allied Theory	Course Code: 06AT01
Course Title : ALLIED PHYSICS – I	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Explain the basic concepts of acoustic studies	K1,K2 & K3
CO 2	Understanding the properties of matter like elasticity, viscosity and surface tension	K1,K2 & K3
CO 3	Outline theory of laws of thermodynamics	K1,K2 & K3
CO 4	Understanding the basic concept of electricity and magnetism	K1,K2 & K3
CO 5	Applying the methodology of optical activities.	K1,K2 & K3

K1- Remembering

K2-Understanding

K3-Applying

Part III : Allied Theory	Course Code: 06AT02
Course Title : ALLIED PHYSICS – II	

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Differentiate various wave phenomenon of light such as interference, diffraction and polarization	K1,K2 & K3
CO 2	Understanding the concept of spin and its implication in classification of elements	K1,K2 & K3
CO 3	Distinguish between Nuclear Fission and Fusion and their applications	K1,K2 & K3
CO 4	Understanding the significance of Lorentz transformation and Mass energy equivalence	K1,K2 & K3
CO 5	Distinguish between Junction Diode and Zener Diode and explain various logic gates	K1,K2 & K3

K1- Remembering

K2-Understanding

K3-Applying