

# ST. STEPHEN'S COLLEGE UZHAVOOR

(Affiliated To Mahatma Gandhi University, Kottayam)



## PROGRAMME OUTCOMES

UZHAVOOR P. O, KOTTAYAM, KERALA – 686 634

Email: [info@ststephens.net.in](mailto:info@ststephens.net.in)

Website: [www.ststephens.net.in](http://www.ststephens.net.in)

## Graduate Programme Outcomes – BSc/BCom/BA

Graduate Programmes offered by Mahatma University is Outcome-based, and the expected outcomes are as follows

<b>PO1</b>	Domain Knowledge: Enhancing the horizon of knowledge so as to enable the learners to pursue academic or professional careers.
<b>PO2</b>	Ideal Citizenship: Demonstrate empathetic social concern and equity-centered development as a responsible citizen, and the ability to act with an informed awareness of issues as well as participate in civic life through volunteering.
<b>PO3</b>	Engage in life long learning: Recognise the need and have the preparation and ability to engage in independent and life long learning in the context of an ever-changing world.
<b>PO4</b>	Social Interaction: Become competent, committed, conscious, creative and compassionate citizens, for and with others.
<b>PO5</b>	Ethics: Intercultural and ethical competency, visible through a readiness to serve humanity.
<b>PO6</b>	Global Competence: Integrates the knowledge of the world, and the skill of application, with the disposition to think and behave on a global stage.
<b>PO7</b>	Effective Communication: Develop effective communication skills and the ability to work in teams.
<b>PO8</b>	Environment Consciousness and Sustainability: Develop in the students an attitude of reconciliation between humans and nature which will help them become peacemakers, defenders of the poor and helpers of the environment.
<b>PO9</b>	Digital Competence: Ability to use techniques, skills and modern information technology tools at their study and work place.

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# **ST. STEPHEN'S COLLEGE UZHAVOOR**

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## **PROGRAMME SPECIFIC OUTCOMES B Sc Physics**

**UZHAVOOR P. O, KOTTAYAM, KERALA – 686 634**

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Bachelor of Science in Physics Programmes offered by Mahatma University is Outcome-based, and the expected PSOs are as follows

<b>PSO1</b>	Provide a comprehensive introduction to all areas of Physics.
<b>PSO2</b>	Comprehend theoretical concepts of the various physical phenomena
<b>PSO3</b>	Acquire skills for applying theories to solve real-world problems.
<b>PSO4</b>	Acquire experimental, analytical, and computational skills to solve physics problems.
<b>PSO5</b>	Motivate students to higher studies and research in different areas of basic and applied Physics.
<b>PSO6</b>	Enhance the student's academic abilities, personal qualities, and transferable skills to develop as responsible citizens.

**Name of the Programme : BSc Physics**

<b>Course Code</b>	<b>Course Title</b>	<b>Course Outcomes</b>	
<b>SEMESTER 1</b>			
PH1CR T01	Methodology and perspectives of Physics	CO1	Create awareness about the history of physics, emphasising contributions of great scientists.
		CO2	Introduce differential, integral and vector calculus, curvilinear coordinates etc.
		CO3	Study the basic principles of various measuring instruments and errors propagation.
<b>SEMESTER 2</b>			
PH2CR T02	Mechanics and properties of matter	CO1	Learn the basics of properties of matter, demonstrate how Young's modulus and rigidity modulus are defined and how they are evaluated.
		CO2	Understand the working of different types of pendulum, study the elastic behaviour of materials, surface tension and viscosity of fluids etc.
		CO3	Learn the fundamentals of harmonic oscillator model, including damped and forced oscillations.
<b>SEMESTER 3</b>			
PH3CR T03	Optics, laser and fiber optics	CO1	Use the principles of wave motion and superposition to explain the physics of polarisation, interference and diffraction.
		CO2	Understand the basics of modern optics like Lasers, Fiber optics and holography.
		CO3	Solve problems in optics by selecting the appropriate equations and performing numerical or analytical calculations.
<b>SEMESTER 4</b>			
PH4CR T04	Semiconductor Physics	CO1	Understand the fundamentals of diodes and their applications.

		CO2	Analyse the characteristics of transistor and transistor biasing circuits, integrated circuits, modulation etc.
		CO3	Gain basic ideas on construction and working of electronic devices and circuits and communication systems.
		CO4	Apply the principles of electronics in day today life.
<b>SEMESTER 5</b>			
PH5CR T05	Electricity and Electro-dynamics	CO1	Gain elaborated knowledge about electrostatics and laws governing the charge distribution.
		CO2	Realize the importance of Maxwell's equations, displacement current and wave propagation
		CO3	Study in depth the transient current response which is essential in designing as well as understanding the working of circuits.
		CO4	Solve complex problems involving linear electrical networks employing the symmetry concepts together with various network theorems.
PH5CR T06	Classical and quantum mechanics	CO1	Study different frames of references, constraints, Lagrangian and Hamiltonian formalisms etc.
		CO2	Realize the inadequacies of classical mechanics that lead to the development of quantum concepts.
		CO3	Grasp the idea of Wave Mechanics, the concept of eigenvalues, eigenfunctions and learn the basic postulates of quantum mechanics
		CO4	Formulate and solve Schrödinger's equation for many systems such as particle in a box, potential barrier, Harmonic oscillator etc.
PH5CR T07	Digital electronics and programming	CO1	Understand the fundamentals of codes and number system, binary arithmetic, logics and boolean functions.
		CO2	Study the design and working of various combinational and sequential logic circuits.
		CO3	Develop a greater understanding of the issues involved in programming language design and implementation
		CO4	Train the students the basic concepts of object oriented programming languages and provide exposure to problem solving through programming in C++
PH5CR T08	Environmental Physics and human rights	CO1	Prepare students for careers as leaders in understanding and addressing complex environmental issues from a problem oriented interdisciplinary perspective.
		CO2	Master core concepts and methods from ecological and physical sciences and application in environmental problem solving.
		CO3	Understand human rights, its protection and activities against it in a global perspective.
<b>SEMESTER 6</b>			
PH6CR T09	Thermal and statistical	CO1	Understand the central concepts and basic formalisms of specific heat, entropy, quantum theory of radiation etc.

	Physics	CO2	acquire knowledge in heat transfer, production of low temperature, liquefaction of gases etc.
		CO3	Study the statistical distribution of particles, ensembles, classical and quantum statistics etc.

PH6CR T10	Relativity and spectroscopy	CO1	Provide an idea of Galilean and Lorentz transformations and effects of special relativity which has significance in high energy Physics.
		CO2	Gain deeper understanding of interaction between matter and radiation.
		CO3	Study the principle and instrumentation of various spectrometers including NMR and ESR systems.
PH6CR T11	Nuclear, particle and astrophysics	CO1	Understand the concepts and potential applications nuclear and particle Physics.
		CO2	Apply general considerations of quantum physics to atomic and nuclear systems.
		CO3	Expand and evaluate the theoretical predictions on nuclear models and nuclear reactions.
		CO4	Understand the evolution of stars and other heavenly bodies.
PH6CR T12	Solid state Physics	CO1	Outline the importance of solid state Physics in the modern society.
		CO2	Explore the relationships between chemical bonding & crystal structure and their effects.
		CO3	Study the conduction mechanism in solids including superconductors.
		CO4	Transfer the knowledge level from theoretical physical subjects towards the understanding of basic properties of solid state matter.
PH6CB T04	Instrumentation	CO1	Explore different types of measuring instruments including mechanical, electrical and electronics
		CO2	Familiarise with different types of sensors and transducers
		CO3	Design and construction of measuring instruments using different types of transducers