PROGRAMME OUTCOMES
PROGRAMME SPECIFIC OUTCOMES
COURSE OUTCOMES

M.Sc Physics

Outcomes

At the end of Post Graduate Program at St. Thomas College (Autonomous), a student will have obtained:

PO1	Attained profound Expertise in Discipline
PO2	Acquired Ability to function in multidisciplinary domains
PO3	Attained ability to exercise Research Intelligence in investigations and Innovations
PO4	Learnt Ethical Principles and be committed to Professional Ethics
PO5	Incorporated Self-directed and Life-long Learning
PO6	Obtained Ability to maneuver in diverse contexts with Global Perspective
PO7	Attained Maturity to respond to one's calling

Program Specific Outcomes

At the end of M.Sc Physics at St. Thomas College (Autonomous), Thrissur, a student will have developed:

PSO1	Understand the advanced concepts of Classical Mechanics Electrodynamics, Solid State Physics and Spectroscopy.
PSO2	Recognize the significance of mathematical modelling, computation simulation technique and acquire ability to solve problems using mathematical methods.
PSO3	Acquire systematic understanding of the theoretical basis of topics Quantum Mechanics, Statistical Mechanics, Nuclear and Particle Physics.
PSO4	Understand and apply the various concepts of Electronics, Microprocessors,Microcontrollers, Experimental Techniques, Laser Systems and Optical Fibres.
PSO5	Apply and verify theoretical concepts through laboratory experiments. Understand the current research activities.

Course Outcomes

M.Sc Physics

Phy1c01- Classical Mechanics

At the end of this course, a student will have developed ability to:

CO1	Understand the necessity of Lagrangian, and Hamiltonian formalism for solving problems in physics and analyse which of these strategies is most useful for a given problem.
CO2	Understand the classical background behind the quantum mechanics and analyse it using canonical transformations and Hamilton – Jacobi method
CO3	Understand and apply the theory of rigid body motion in several areas of physics
CO4	Understand the theory of small oscillations and apply it to several areas of physics.
CO5	Describe the classical applications in the field of nonlinear dynamics and chaos

M.Sc Physics

Phy1c02- Mathematical Physics -1

At the end of this course, a student will have developed ability to:

CO1	Understand and apply the concept of Vector Calculus in different coordinate system
CO2	Understand the aspects of Matrices & Tensor
CO3	Understand about Second order differential equations
CO4	Understand and analyze different Special functions
CO5	Understand and apply the concepts of Fourier Series, Fourier Transform & Laplace Transform

M.Sc Physics

Phy1c03- Electrodynamics And Plasma Physics

At the end of this course, a student will have developed ability to:

CO1	Understanding the basics of time varying fields and radiations
CO2	Understanding the propagation of plane electromagnetic waves through different media
CO3	Analyze the propagation of electromagnetic waves through a transmission line and wave guides.
CO4	Understand the concept of relativistic electrodynamics
CO5	Understand the plasma physics and antenna fundamentals

M.Sc Physics

Phy1c04- Electronics

At the end of this course, a student will have developed ability to:

CO1	Understand the different types of FET and it's applications and digital MOSFETs
CO2	Understand the construction and working of different type of microwave and photonic devices
CO3	Understand the features of operational amplifier and properties of it
CO4	Understand the applications of OPAMP and uses of it
CO5	Analyze the digital- electronics and vice versa of counters and flip flop

M.Sc Physics

Phy1a01- Ability Enhancement Course (Aec)

At the end of this course, a student will have developed ability to:

CO1	Analyze the current research programmes in various fields of physics
CO2	Understand the idea of writing seminar reports
CO3	Understand how to present a seminar

M.Sc Physics

Phy2c05- Quantum Mechanics – I

At the end of this course, a student will have developed ability to:

CO1	Understanding the fundamental mathematical aspects, formulation and development of quantum mechanics
CO2	Understanding the dynamical aspects of quantum mechanics
CO3	Understanding the development of angular momentum and how it is suitable for various applications
CO4	Applied the knowledge about potential into various environments
CO5	Understanding how Invariance Principles and Conservation Laws are influencing operators and wave functions

M.Sc Physics

Phy2c06- Mathematical Physics - II

At the end of this course, a student will have developed ability to:

CO1	Understand the basic elements of complex mathematical analysis, including the integral theorems and apply it to obtain the residues of a complex function and use this basic concepts of complex functionsto evaluate definite integrals
CO2	Understand the applications of group theory in all the branches of Physics problems.
CO3	Understand and apply the calculus of variables method to solve problems in several areas of physics
CO4	Understand and analyze the basic concepts of integral equations and how to solve mathematical problems involving integral equations of interest in Physics.
CO5	Understand the applications of Green Functions

M.Sc Physics

Phy2c07- Statistical Mechanics

At the end of this course, a student will have developed ability to:

CO1	Understanding the statistical basics of thermodynamics
CO2	Analyze the three ensembles of statistical mechanics
CO3	Understanding the formulation of quantum statistics
CO4	Apply the quantum statics to Ideal Bose systems
CO5	Apply the quantum statics to Ideal Fermi systems and understand the Ising model

M.Sc Physics

Phy2c08- Computational Physics

At the end of this course, a student will have developed ability to:

CO1	Develop proficiency to write programs using repetitive control structures, selection statements, built in objects, especially the object-oriented concepts of Python and the usage of data structures like lists, dictionaries.
CO2	Gain a complete understanding in creation of arrays and matrices, its operations and plotting of visually appealing graphs using Python
CO3	Create a problem solving capability using basic techniques of numerical analysis and able to select suitable method for solving various physics problems.
CO4	Learn how to apply advanced python programming to visualize physical problems/ real world problems.

M.Sc Physics

Phy2a02- Professional Competancy Course(Pcc)

At the end of this course, a student will have developed ability to:

CO1	Research report writing
CO2	Making of typesets

M.Sc Physics

Phy1l01 & Phy2l03- General Physics Practical

At the end of this course, a student will have developed ability to:

CO1	Understand and analyze mechanical properties of materials
CO2	Understand and analyze the thermal properties of materials
CO3	Understand and analyze the electrical and magnetic properties of materials
CO4	Understand and analyze the optical properties of materials

M.Sc Physics

Phy1l02 & Phy2l04- Electronics Practical

At the end of this course, a student will have developed ability to:

CO1	Understand the characteristics of various transistors
CO2	Understand the amplification properties of electronic components
CO3	Understand and apply the properties of OPAMPs
CO4	Understand and analyze the applications of digital ICs

M.Sc Physics

Phy3c09- Quantum Mechanics – II

At the end of this course, a student will have developed ability to:

CO1	Apply time independent perturbation theory as an approximation method
CO2	Apply variational method and WKB method as approximation methods
CO3	Apply time dependent perturbation theory as an approximation method
CO4	Understanding scattering theory in terms of quantum mechanics
CO5	Understanding the concepts of relativistic quantum mechanics

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Phy3c10- Nuclear And Particle Physics

At the end of this course, a student will have developed ability to:

CO1	Understanding the basics concepts about the nucleus and analyze its internal structure and properties
CO2	Understand and analyze the nuclear decays and their probabilities
CO3	Analysis of nuclear models and their reactions
CO4	Explain different methods for nuclear radiation detection and basic ideas for nuclear electronics
CO5	Gain the knowledge on elementary particles, their interactions, and experimental evidences for the existence of quarks

M.Sc Physics

Phy3c11- Solid State Physics

At the end of this course, a student will have developed ability to:

CO1	Understanding various crystal structures are expected
CO2	Understanding lattice vibrations and how it influencing fundamental properties of materials
CO3	Understanding different theoretical models to explain the fundamental properties of materials
CO4	Understanding how electric and magnetic properties in materials are generated and their classification
CO5	Understanding different environments in which superconducting properties in materials are generated
CO6	Understanding nanomaterials and how shape or size influencing the material properties

M.Sc Physics

Phy3e05- Experimental Techniques

At the end of this course, a student will have developed ability to:

CO1	Explain the working of vacuum unit and find its applications
CO2	Basic knowledge of thin film materials and its deposition technique and find its applications
CO3	Understanding of various particle accelerators and its application
CO4	Analysis the Materials by various nuclear techniques
CO5	Identify the Structure of the material of by X- ray Diffraction

M.Sc Physics

Phy4c12- Atomic And Molecular Spectroscopy

At the end of this course, a student will have developed ability to:

CO1	Understand various concepts in Atomic Spectroscopy
CO2	Understand the aspects of Microwave & IR spectroscopy
CO3	Understand the various aspects of linear & non-linear Raman Effect
CO4	Understand Electronic Spectroscopy of molecules
CO5	Understand the fundamental concepts of NMR, ESR and Mössbauer Spectroscopy

M.Sc Physics

Phy4e13- Laser Systems, Optical Fibers And Applications

At the end of this course, a student will have developed ability to:

CO1	Discuss theory of lasing action
CO2	Illustrate various laser systems and compare their working principle.
CO3	To outline various nonlinear process and to design various experimental techniques
CO4	To illustrate various application of lasers
CO5	Understand and explain optical fibers and its applications

M.Sc Physics

Phy4e20- Microprocessors, Micro Controllers And Applications

At the end of this course, a student will have developed ability to:

CO1	Introduction to intel 8085 and its programming
CO2	Understanding the timing and interfacing of memory and I/O devices
CO3	Gain knowledge on chips used for interfacing
CO4	Acquire the basic knowledge about microcontrollers and Programming and analyze on its applications
CO5	Understand the basic concept of AVR programming and its applications

M.Sc Physics

Phy3l05 & Phy4l06- Modern Physics Practical

At the end of this course, a student will have developed ability to:

CO1	Understand the nuclear physics experiments
CO2	Understand different experimental techniques
CO3	Understand the advanced electronics experiments
CO4	Understand the basics of lasers and fiber experiements
CO5	Understand the basics of spectroscopy

M.Sc Physics

Phy4l07- Computational Physics Practical

At the end of this course, a student will have developed ability to:

CO1	Development of numerical method for problem solving
CO2	Understanding pyhton language
CO3	Skill in writing program
CO4	Familarization with computer
CO5	Applications of python in physics problems