CHRIST NAGAR COLLEGE

A CMI Educational Institution
Affiliated to the University of Kerala

MARANALLOOR, THIRUVANANTHAPURAM

PROGRAMME OUTCOMES

PROGRAMME SPECIFIC OUTCOMES

COURSE OUTCOMES

BSC PHYSICS & COMPUTER APPLICATIONS

PROGRAMME OUTCOME (PO)

On completion of a UG Programme from Christ Nagar College, students should be able to demonstrate the **programme outcomes** listed below:

PO1:PROFESSIONALISM AND ETHICS- Demonstrate accountability and professionalism that is rooted in ethical, altruistic, moral, and humanistic principles.

PO2:LEADERSHIP AND SOCIAL ACUITY - Capable of taking responsibilities as a leader and demonstrate responsiveness to the regional and national environments developing abilities to manage challenges for nation building.

PO3:DIGITAL COMPETENCE: Able to use technology and skills to process information and data for the benefit of the society.

PO4:COMMUNICATION AND TEAM WORK- Interact effectively with stakeholders, fostering an environment of team work, mutual respect and shared decision making skills.

PO5:CRITICAL THINKING - Foster in students an inquisitive mind to analyze and develop capacity to become an active leaner through critical thinking.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO 1	Providing deep knowledge in Physics so that students are able to analyse and apply the knowledge of Physics in an innovative, dynamic and challenging environment for design and development of new products **(Understand, Apply)**.
PSO 2	Making students capable to solve practical, design and analysis problems to completethe challenge to fabricate, test and develop the products with more innovative technologies **(Analyse, Understand and Apply)**
PSO 3	Design solutions for complex Physics problems and design systems that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations **(Understand and apply)**.

COURSE OUTCOMES

BSc PHYSICS AND COMPUTER APPLICATIONS

SEMESTER 1

COURSE CODE	COURSE NAME		COURSE OUTCOME
EN1111.3	LANGUAGE SKILLS	CO1	**Define** the tenets of soft skills and the four-fold skills. (**Remember**)
		CO2	**Explain** elements of basic communication through micro and macro skills (**Understand**)
		CO3	**Develop** conversational skills through dialogue writings. (**Apply**)
		CO4	**Analyse** the students' ability as a critical reader and writer. (**Analyze**)
		CO5	**Create** expertise in business and professional writing to endorse employability. (**Create**)
HN1111.3	HINDI GADYA SAHITYA	CO1	**Recollect** the main works of the prescribed fiction writers (**Remember**)
		CO2	**Observe** the craft of the fiction writers (**Understand**)
		CO3	**Research** how the resource language is used as a medium in creative writing (**Understand**)
		CO4	**Analyze** the character sketches in the prescribed works (**Analyze**)
		CO5	**Judge** the novel on the basis of subject and relevance among contemporary Hindi novels (**Understand**)
ML1111.3	PROSE LITERATURE	CO1	**Identify** major literary figures in Malayalam literature (**Remember**)
		CO2	**Compare** the characteristics of novel and short story (**Understand**)
		CO3	**Explain** various genres of Malayalam prose writing (**Understand**)
		CO4	**Choose** correct usage of vocabulary (**Apply**)
		CO5	**Analyze** social life through the study of personal history (**Analyze**)
PC1121	MECHANICS, THERMODYNAMICS AND PROPERTIES OF MATTER	CO1	**Understand** and **Analyze** the dynamics of rigid bodies and **Apply** these concepts to solve the mechanics of the systems. (**Understand, Analyse, Apply**)
		CO2	**Discuss** the basic thermodynamic conceptsand working of heat engines and refrigerators and **Solve** the problems related to various thermodynamic systems (**Understand, Apply**)
		CO3	**Analyze** and **Apply** the concept of elasticity in explaining the bending of structures. (**Analyze, Apply**)

		CO4	**Discuss** the properties of fluids and **Illustrate** their application. **(Understand, Apply)**
		CO5	**Discuss** different modes of transmission of heat and **Apply** it to our day-to-day life. **(Analyse, Apply)**
PC1171	**COMPUTER FUNDAMENTALS AND ORGANIZATION**	CO1	**Describe** the basic hardware components of computer system **(Understand).**
		CO2	**Compare** different memory units, storage devices and various architectures of control unit **(Understand)**
		CO3	**Illustrate** the concept of instruction set **(Understand)**
		CO4	**Discuss** input-output organization and different modes of data transfer **(Understand)**
		CO5	**Discuss** transfer Modes **(Understand)**
MM1131.6	**CALCULUS, INFINITE SERIES AND VECTOR ALGEBRA**	CO1	**Recall** basic concepts, techniques and standard results of differentiation, integration and vector algebra. **(Remember)**.
		CO2	**Illustrate** special points of a function, curvature, Leibintz theorem, Rolle's theorem, mean value theorem and reciprocal vectors. **(Apply)**
		CO3	**Compute** mean value of function, length of curve, surface area of revolution and volume of revolution using integration. **(Apply)**
		CO4	**Calculate** limit of various series, approximation of error in Taylor series, scalar triple product, vector triple product and distance using vectors. **(Apply)**
		CO5	**Explain** reduction formulae, infinite and improper integral, plane polar coordinates and integral inequalities. **(Analyze)**

SEMESTER 2

COURSE CODE	COURSE NAME		COURSE OUTCOME
EN1211.3	**ENGLISH GRAMMAR, USAGE AND WRITING**	CO1	**Identify** grammatical items and sentence structures of English grammar. **(Remember)**
		CO2	**Change** sentences using basic rules of English grammar. **(Apply)**
		CO3	**Test** grammatical competence at application level. **(Analyze)**
		CO4	**Find** error in sentences and correct them **(Evaluate)**
		CO5	**Develop** writing skills for special purposes and academic writing. **(Create)**
ML1211.3	**DRISYAKALASAHITHYAM**	CO1	**Identify** major visual art forms of kerala **(Remember)**
		CO2	**Compare** the characteristics of attakkatha and thullal **(Understand)**
		CO3	**Explain** the development of screenplay **(Apply)**
		CO4	**Explain** the development of screenplay **(Apply)**
		CO5	**Evaluate** various art forms **(Evaluate)**

HN1211.3	HINDI PADYA SAHITYA	CO1	**Recollect** the major works of the prescribed poets (**Remember**)
		CO2	**Relate** the contributions of the poets (**Understand**)
		CO3	**Analyze** the craft used in ancient & modern poetry (**Analyze**)
		CO4	**Develop** the creative writing skills of students (**Apply**)
		CO5	**Classify** the meaning and characteristics of modern poetry (**Understand**)
PC1221	INTRODUCTION TO PROGRAMMING	CO1	**Explain** algorithms, flowchart and basic structure of C programming (**Understand**)
		CO2	**Construct** C programs using operators and control structures (**Apply**)
		CO3	**Apply** the concepts of arrays, pointers and functions in C language (**Apply**)
		CO4	**Illustrate** the use of string functions in C language (**Apply**)
		CO5	**Explain** the different file handling functions in C-language (**Apply**)
PC1241	ENVIRONMENTAL STUDIES	CO1	**Recognize** the role of an individual in conservation of natural Resources. (**Remember, Understand**)
		CO2	**Trace** the concept of an ecosystem. (**Understand, Apply**)
		CO3	**Explain** the causes, effects and control measures of pollution. (**Evaluate, Apply**)
		CO4	**Analyze** the biodiversity in our world. (**Analyze,Understand**)
		CO5	**Prepare** a project report based on an environmental issue. (**Understand, Analyse, Create**)
MM1231.6	ANALYTIC GEOMETRY, INTEGRATION, DIFF. EQUATIONS & MATRICES	CO1	**Recall** basic concepts of differentiation, integration, vectors and complex numbers. (**Remember**).
		CO2	**Explain** theorems of partial differentiation, differentiation and integration of vectors, chain rule, Taylor's theorem for many variable functions, space curves, vector functions of several arguments, surfaces-scalar and vector fields. (**Apply**)
		CO3	**Determine** combinations of grad, curl and div of a vector field, vector operators on sum and product of vectors, de Moivre's theorem, trigonometric identities, hyperbolic functions, double and triple integrals and general properties of Jacobians (**Apply**)
		CO4	**Compute** total differential and total derivative, stationary values under constraints, gradient of scalar field, curl and divergence of a vector field, n^{th} roots of unity, solution of polynomial equations, complex logarithm and powers and areas and volumes. (**Apply**)
		CO5	**Analyze** exact and inexact derivative, stationary values of many variable functions, cylindrical and spherical polar coordinates, applications to differentiation, integration and multiple integrals, change of variables in multiple integrals and some special infinite integrals. (**Analyze**)

SEMESTER 3

COURSE CODE	COURSE NAME		COURSE OUTCOME
EN1311.3	ENGLISH FOR CAREER	CO1	**Recall** the grammatical and syntactical rules by solving remedial exercises. **(Remember)**
		CO2	**Practice** the vocabulary essential for professional communication. **(Apply)**
		CO3	**Analyze** passages for comprehension using logical and critical thinking. **(Analyze)**
		CO4	**Test** vocabulary, grammar, comprehension, and Remedial English from the perspective of career oriented tests. **(Evaluate)**
		CO5	**Construct** sentences without errors using remedial grammar. **(Create)**
PC1341	ELECTRODYNAMICS	CO1	**Discuss** the phenomena of electrostatics, related laws and their applications, potential of charges and their related equation and energy of charges. **(Apply, Evaluate)**
		CO2	**Discuss** on electrostatic field and polarisation in matter including dielectric and their related studies. **(Understand, apply)**
		CO3	**Discuss** the basic concepts and laws in magnetostatics and electromagnetic induction and their applications. **(Apply, Evaluate)**
		CO4	**Discuss** the Maxwell equations in different media and apply them to explain the nature and properties of electromagnetic waves and discuss the energy and momentum of electromagnetic waves. **(Apply)**
		CO5	**Discuss** the basic concepts and theorems related to electrical circuits and apply these concepts to solve and design various circuits. **(Apply, Create)**
CP1371	MICROPROCESSOR AND PROGRAMMING	CO1	**Define** the basic concepts and architecture of 8086 microprocessor **(Remember)**
		CO2	**Explain** about the instructions of 8086 microprocessor **(Understand)**
		CO3	**Explain** about the interrupts of 8086 microprocessor **(Understand)**
		CO4	**Develop** assembly language programs for various applications **(Create)**
		CO5	**Recognize** various advanced architectures of microprocessors. **(Remember)**
PC 1372	DATA STRUCTURES	CO1	**Distinguish** the different searching and sorting techniques. **(Analyze)**
		CO2	**Illustrate** the static and dynamic implementation of Stack and Queue data structures. **(Apply)**
		CO3	**Illustrate** the memory representation and different operations performed on linked list data structure. **(Understand)**
		CO4	**Explain** the operations performed on nonlinear data structures such trees and graphs **(Understand)**
		CO5	**Apply** the applications of stack data structure **(Apply)**

MM1331.6	THEORY OF MATRICES, VECTOR INTEGRATION, DIFFERENTIAL EQUATIONS AND FOURIER SERIES	CO1	**Define** Simple Harmonic Motion, Wave Motion, Periodic Functions and Ordinary differential equations. (**Remember**)
		CO2	**Discuss** Fourier Series, Average Value of a Function, Fourier Coefficients, Dirichlet Conditions, Complex Form of Fourier Series, Other Intervals, Even and Odd Functions, Parseval's Theorem, Fourier Transforms, Matrices and Determinants, Physical examples of line integrals Connectivity of regions - Green's theorem in a plane - Conservative fields and potentials Physical examples of surface integrals, Integral forms for grad, div and curl - Green's theorems, Other related integral theorems , Physical applications of the divergence theorem ,Stokes theorem and related theorems ,Related integral theorems - Physical Applications.(**Understand**)
		CO3	**Solve** First Order Ordinary Differential Equations, Exact ODEs. Integrating Factors - Linear ODEs - Bernoulli Equation - Orthogonal Trajectories - Homogeneous Linear ODEs with Constant Coefficients-Euler Cauchy Equations, Non-homogeneousODEs. (**Create**)
		CO4	**Explain** Row Reduction, Cramer's Rule for solving system of equations - Vectors - Lines and Planes - Linear Combinations - Linear Functions - Linear Operators - Linear Dependence and Independence - Special Matrices like Hermitian matrices and Formulas-Linear Vector Spaces - Eigenvalues and Eigenvectors-Diagonalizing Matrices - Applications of Diagonalization. (**Apply**)
		CO5	**Evaluate** Evaluating Line integrals, Line integrals with respect to a scalar Surface integral, surface integrals - Vector areas of surfaces, Volume integrals - Volumes of three-dimensional regions (**Evaluate**)

SEMESTER 4

COURSE CODE	COURSE NAME		COURSE OUTCOME
EN1411.3	READINGS IN LITERATURE	CO1	**Identify** the style and literary devices employed in poetry. (**Remember**)
		CO2	**Critique** the works prescribed for study. (**Evaluate**)
		CO3	**Analyze** literature as a cultural phenomenon. (**Analyze**)
		CO4	**Develop** novel interpretations using critical thinking. (**Create**)
		CO5	**Develop** an appreciation of literary discourse (**Apply**)

PC1441	CLASSICAL MECHANICS AND THEORY OF RELATIVITY	CO1	Discuss the basic concepts simple harmonic motion and derive the equation for different situations **(Apply)**
		CO2	Discuss the fundamentals of central force, law related to orbital motion and their application **(Apply)**
		CO3	Discuss the basic concepts of Lagrangian approach, its comparison to Newtonian mechanism, D'Alembert's principle and their application. . **(Apply)**
		CO4	Explain the special theory of relativity, various transformation of coordinates with frame of reference **(Apply)**
		CO5	Understand and analyse the phenomenons related to theory of relativity. **(Apply, Analyse)**
PC1442	OPTICS	CO1	Discuss the basic concepts of superposition interference and analyse the concepts using practical systems **(Apply, Analyse)**
		CO2	Discuss electrostatic field and polarization in matter including dielectric and solve problems based on this **(Understand, apply).**
		CO3	Discuss the basic concept of diffraction,analyse the concepts and discuss the working of different optical devices. **(Apply, Analyse, Create)**
		CO4	Explain the principles, dispersion and polarization and their applications. **(Understand, Apply)**
		CO5	Discuss the basic concepts of Laser and their working principle and explain communication by fibre optics. **(Understand, Apply)**
PC1471	SOFTWARE ENGINEERING	CO1	Describe the principles of the engineering processes in software development **(Understand)**
		CO2	**Illustrate** different project estimation techniques. **(Apply)**
		CO3	**Analyze** the requirements for the software projects. **(Analyze)**
		CO4	**Design** the requirements of the software projects using function oriented and object-oriented approach. **(Create)**
		CO5	**Describe** the different levels of testing, software quality assurance and maintenance **(Understand)**
PC1472	OBJECT ORIENTED PROGRAMMING USING C++	CO1	**Explain** the concepts of OOP and the basic structure of C ++ programming **(Understand)**
		CO2	**Apply** the concept of classes, objects, friend functions, constructors, destructors and operator overloading **(Apply)**
		CO3	**Develop** C++ programs using the concept of inheritance and dynamic memory allocation **(Apply)**
		CO4	**Construct** C++ programs using the concept of polymorphism, I/O and file management and exception handling. **(Apply)**
		CO5	**Illustrate** the object-oriented programming concepts using real world examples. **(Analyze)**

MM1431.6	ABSTRACT ALGEBRA, LAPLACE TRANSFORMS, SPECIAL FUNCTIONS AND FUNCTIONS OF A COMPLEX VARIABLE	CO1	**Explain** Groups, Subgroups, Finite Groups, Cyclic Groups, Rings, Integral Domains, Fields, Gamma Function, Analytic Function. (**Understand**)
		CO2	**Discuss** Elementary Properties of Groups and Cyclic Groups, The Factorial Function, Functions of a Complex Variable, Cauchy's Theorem, The Residue Theorem, Residues at Infinity (**Understand**)
		CO3	**Solve** problems using Laplace Transforms, Elementary Functions Translation and Convolution Theorem. (**Apply**)
		CO4	**Explain** Limits of Integration Unit Step Function, Inverse Transform, Partial Fraction Expansion, Laplace Transforms of Derivatives, Inverse Laplace Transforms, Recursion Relation, Some Important Formulas Involving Gamma Functions, Beta Functions, Cauchy-Riemann Relations Methods of Finding Residues (**Apply**)
		CO5	**Evaluate** Gamma Function of Negative Numbers, Beta Functions in Terms of Gamma Functions, Definite Integrals by use of The Residue Theorem, Contour Integrals, Cauchy's Integral Formula, Laurent Series (**Evaluate**)

SEMESTER 5

COURSE CODE	COURSE NAME	COURSE OUTCOME	
PC 1541	ELECTRONICS	CO1	**Get** basic ideas about the theory of semiconductors and understand the basics of p-n junction and different diodes (**Understand, Apply**)
		CO2	**Interpret** the construction, characteristics and working of BJT and evaluate its applications in differentelectronic circuits. (**Analyse, Apply**)
		CO3	**Understand** the basics of different types of power amplifiers and oscillators and analyse their applications (**Understand, Analyse**)
		CO4	**Understand** the principles of modulation and communication and their applications in various fields (**Understand, Apply**)
		CO5	**Simplify** Boolean expressions and construct binary adder, subtractor and flip flops using logic gates (**Apply, Analyse**)

PC1542	ATOMIC AND NUCLEAR PHYSICS	CO1	**Understand** different atoms models evaluating the numerical problems related to the same (**Understand, Apply**)
		CO2	**Get** an idea about the atomic spectra. and apply these concepts to solve problems relating various atomic spectra (**Understand, Apply**)
		CO3	**Understand** and analyse different nuclear models and analysing their properties (**Understand, Analyse**)
		CO4	**Analyze** practical applications of different nuclear reactions and analysing their holocaust (**Understand, Analyse**)
		CO5	**Attain** phenomenological understanding of elementary particles, their fundamental interactions and analysis of quark model related to nuclear physics (**Understand, Evaluate**)
PC 1571	DATABASE MANAGEMENT SYSTEMS	CO1	**Explain** the concept of database, relational data model and its operation.(**Understand**)
		CO2	**Develop** skills to design an ER diagram. (**Create**)
		CO3	**Create** database and perform operations using SQL. (**Create**)
		CO4	**Illustrate** functional dependencies (**Apply**)
		CO5	**Illustrate** normalization procedures in database(**Apply**)

SEMESTER 6

COURSE CODE	COURSE NAME		COURSE OUTCOME
PC1671	COMPUTER NETWORKS & SECURITY	CO1	**Describe** about computer networks and data communication (**Understand**)
		CO2	**Explain** different models and its comparison (**Understand**)
		CO3	**Illustrate** different techniques for error detection and correction (**Apply**)
		CO4	**Determine** the different routing algorithms for routing (**Apply**)
		CO5	**Explain** the concepts of cryptography, authentication systems and various security measures in web, email and network systems. (**Analyze**)

PC1641	SOLID STATE PHYSICS	CO1	**Analyze** crystal structure and applying the theory for the elucidation of crystal structure of unknown crystal **(Understand,Apply, Analyse)**
		CO2	**Understand** different diffraction techniques and their applications. **(Understand, apply)**
		CO3	**Understand** and analyse the free electron theory of metals and their comparison to kinetic theory of gases, explaining various properties of metals thermodynamically **(Understand, Analyse, Apply)**
		CO4	**Compare** different specific heat models for metals and analysing band theories **(Analyze)**
		CO5	**Able** to understand and analyse the phenomena of superconductivity and its applications. **(Understand, Analyze)**
PC1672	OPERATING SYSTEMS	CO1	**Describe** the different types of OS, its components and services and types of system programs. **(Understand)**
		CO2	**Illustrate** the process management concepts and its scheduling algorithms. **(Apply)**
		CO3	**Demonstrate** the different memory management and protection concepts **(Apply)**
		CO4	**Illustrate** the structure and allocation methods of storage systems and I/O hardware **(Apply)**.
		CO5	**Describe** IO systems and its specifications **(Understand)**
PC1642	STATISTICAL PHYSICS AND QUANTUM MECHANICS	CO1	**Understand** information about the basics of statistical physics and their applications **(Understand, Analyse)**
		CO2	**Understand** and comparing three statistical distributions and judge which distribution applies to a given system **(Understand, Apply)**
		CO3	**Discuss** the emergence of quantum mechanics and identify the quantum mechanical concepts applicable to Physical systems **(Understand, Apply)**
		CO4	**Solve** stationary states like infinite square well, harmonic oscillator and free particle **(Apply)**
		CO5	**Apply** the concepts of Quantum Mechanics to solve problems and derive Equations of motion of Physical systems using quantum concepts **(Apply)**
PC1661.1	ASTRONOMY AND ASTROPHYSICS	CO1	**Familiarize** and appreciate the field of astronomy **(Understand)**
		CO2	**Comprehend** astronomical scales and basic concepts of positional astronomy and can understand about stellar parameters and spectral classification. **(Understand, Apply)**
		CO3	**Understand** basic information about the formation of stars, their magnitudes and luminosity and understand the structure of sun **(Remember, Understand)**
		CO4	**Describe** the classification of stars, stellar evolution, interstellar matter, galaxies etc and understand theorigin of the Planets **(Understand)**
		CO5	**Explain** Earth's motion in space;rotation and revolution,predict seasons using diagram of Earth and sun,Describe what causes seasons **(Understand, Analyse)**