ANNAI VELANKANNI COLLEGE

(Accredited with B++ by NAAC and approved by UGC under section 2(f) & 12(B) status)

THOLAYAVATTAM - 629 157

KANYAKUMARI DISTRICT

Programme Outcomes, Programme Specific Outcomes and Course Outcomes

DEPARTMENT OF TAMIL

Program	Course	Course outcomes	Specific outcomes
I BA	Ikkala Illakiankal	• To help the learners to understand the different aspects of literature	• To make the students to understand the nuances of Tamil literature
	Nanool Ezhuthathikaram	• To enable the students to understand the themes from drama, short , and prose in literature	• To make the student to learn various techniques used in literary text
	Nattuputaviyal	• To get know the culture and traditions from Tamil literature	• To enable the students to understand the cultural aspects from literature
II BA	Yapilakanam	• To sensitise the students with Tamil grammar and its usage in Tamil literature	• To make the students to understand the important of the usage of tamil grammar

	Sanga Illakiam	• To make the students to understand the culture and tradition of Tamil people.	• To enable the students to know the great Tamil culture through Literature
	Penniam	• To enable the students to understand women empowerment and development via literature	• To sensitise the students about the importance of women community
	Pechu kalai	• To develop communication skills among the learners	• To learn strategies of communication to speak effectively in the classroom.
III BA	Kappia Illakiam	• To make the students to understand the literary aspects of Tamil epics.	• To enable the students to understand the nuances of literary capabilities used in epics
	Ilakkiya Varalaru	• To make the learners to understand historical background of Literature.	• To acquaint the learners with influencing factors of history in literature
	Thamizhaka Varalarum Pandadum	• To enable the students to know the culture and tradition of Tamil people	• To sensitise the learners with ancient Tamil culture and tradition through literature.
	Tholiyal	• To make the students to ponder over the creative aspects of the subject	• To enable the student to get to know the significance of methods used in literature
I MA	Illkiayamum Kavithaiyum Naadakamum	• To make the students to understand the various aspects in prose, drama and novels	• To invoke the creativity among the learners to write on their own
		• To make the learners to	• To enable the learners to have a broad

	Ulagatamil	understand the importance of Tamil language throughout the world	spectrum understanding of the manifestation of Tamil language in media
	Ara Illakiam	• Learners would understand the social and moral values from literature	• To make the learners to understand the ethics, and moral values from texts
II MA	Tholkappium Porulathigaram	• To enable the students to understand the literary text and its contextual meaning	• To make the learners to know the in-depth meaning of the literary texts.
	Urai Marapu	• To make the learners to know the importance of Tamil literary creed, and grammar	• To enable the learners to understand the significance of literary principle
	Mandidavial Adipadaikal	• To make the learners to get to know the foundation of human development through the evolution of literature	• To enable the students to broad their knowledge horizon via literary text.

DEPARTMENT OF ENGLISH

2.6.1 Program outcomes and specific outcomes

S.N	Program	Program outcomes
1	BA English	• To educate the student in both the artistry and the utility of the English Language through the study of literature. • To make students aware of the different communicative skills and make them effectively communicate in written and spoken modes. • To provide students with the critical faculties necessary in an academic environment, while at job and in an increasingly complex and interdependent world.
2	MA English	• To understand how British and American literary traditions developed, becoming familiar with significant writers, their works, and the connections between them • To understand the structure of language and its change over time and across social situations and groups • To understand the movements and traditions of Composition and Rhetoric Studies
3	MPhil English	• To be able to think creatively and critically and to write effectively within all these areas of English Studies • Know how to conduct original research and integrate criticism (secondary sources) into your own analyses

Programs	Course	Course outcomes	Specific outcomes
I BA	Indian Writing in English	Students are exposed into rhetorical approach to literary study.	Students could identify the various forms of poetry from diverse cultures and historical periods.
	British Fiction	Prose and poems enabled the students to understand better about the figure of speech and literary devices.	Fundamental enquiry into the novels and plays
	American Literature	To understand the historical evolution of American Literature	Students learnt the literary aspects of American Literature through poems and fiction
	Literary Forms	To understand the different forms of literary terms and their importance in literary texts.	Students will understand the concepts deeply and apply over the literary texts.
II BA	British Poetry	Familiarized the importance of historical movements that influenced literary tastes and standards in British Poetry.	Students would learn British literature with their critical thinking
	Caribbean Literature	To make the students aware of socio-cultural perspectives on Caribbean writings	Learners will have a sound knowledge on different stages of Caribbean literature
	History of English Literature	To enable the student to understand the national changes and transformation in English literature	Student would learn the aspects of historical movements and transitions.

	British Drama	To make the students understand the historical and political contexts in which drama is based.	Learners will have clear idea of literary techniques used in drama.
III BA	Canadian Literature	To enable the students to learn Canadian literature and it society.	Accustomed the students with various dramatic devices and techniques used in different genres.
	Women's writing	To make students to understand the importance of women scenario in the contemporary world.	Students are learnt multi-dimensional approach to women's writing.
	Shakespeare	To make the students to learn the classics of English literature.	Students would develop a sense of literary appreciation among the learners through Shakespearean texts.
	African Literature	To enable the students learn the diversity of literature through African Literature.	Students will learn the diversity and the multi dimensional literary competence to express their thoughts.
I MA	Romantic Period	To enrich the students with classic texts belong to Romantic period	Students are exposed to different concepts and the application of theories
	Indian Writing in	To make the students learn Indian texts with regional contexts	Learners will develop critical sensibilities of Indian literature.

	English		
	American Literature	To enrich the students with historical and literary background of texts with theories.	Students would learn the nuances of American literary writings.
	African Literature	To enable the learners to develop multi-dimensional approach to Non-native literature.	Students are exposed to various genres of writings and socio-economic and cultural precept of different nations.
II MA	Shakespeare	To enrich the students with classical texts of Shakespeare and their relevance in today's context.	Students will learn new dimension in Shakespearean texts
	Commonwealth Literature	To make the learners to understand the subaltern voices of Commonwealth Literature.	Learners will develop a multi-dimensional approach to non-British literature.
	Postcolonial writing	To make the students to understand the nuances of postcolonial writings in Literature	Students will be encouraged to develop a sense of integrated approach to postcolonial Literature
	Research Methodology	To enable the students to understand the research techniques.	Students are exposed to various rules and techniques followed while writing a research article.
MPhil	Critical Theory	To make the research students to have an overall idea of literary theories in English Literature.	Research students will learn the literary theories on how to apply those theories in writing.
	Research Methodology	To enable the students to understand the research techniques.	Students are exposed to various rules, techniques and nuances of writing followed while writing a research article.

DEPARTMENT OF MATHEMATICS

PROGRAM OUTCOMES AND SPECIFIC OUTCOMES

S. N	Program	Program outcomes
1	B.Sc Mathematics	Think in a critical manner. Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand. Formulate and develop mathematical arguments in a logical manner.
2	M.Sc Mathematics	Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses. Encourage the students to do research in different areas.
3	M.Phil Mathematics	To be able to think creatively and critically and to do the research effectively within all these areas of maths Studies. Know how to conduct original research

COURSE OUTCOME

Programs	Course	Course outcomes	Specific outcomes
I B.Sc	**Analytical Geometry of 3D**	Students will able to describe the various forms of equation of a plane,	Students will able to Define skew lines Calculate the Shortest distance between two

	and Vector Calculus	straight line, Sphere, Cone and Cylinder. Find the angle between planes, Bisector planes,Perpendicular distance from a point to a plane, Image of a line on a plane, Intersection of two lines. Define coplanar lines and illustrate. Compute the angle between a line and a plane, length of perpendicular from a point to a line	skew lines. Find and interpret the gradient curl, divergence for a function at a given point. Interpret line, surface and volume integrals Evaluate integrals by using Green's Theorem, Stokes theorem, Gauss's Theorem
	Differential Equations	Students will able to Extract the solution of differential equations of the first order and of the first degree by variables separable, Homogeneous and Non-Homogeneous methods. Find a solution of differential equations of the first order and of a degree higher than the first by using methods of solvable for p, x and y. Compute all the solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable	Students will able to Form partial differential equations. Find the solution of First order partial differential equations for some standard types. Use inverse Laplace transform to return familiar functions. Apply Laplace transform to solve second order linear differential equation and simultaneous linear differential equations.

		coefficients. Solve simultaneous linear equations with constant coefficients and total differential equations.	
II B.Sc	**Abstract Algebra**	Students will able to Define Vector Space, Quotient space Direct sum, linear span and linear independence, basis and inner product. Discuss the linear transformations, rank, nullity.	Students will able to Find the characteristic equation, eigen values and eigen vectors of a matrix. Prove Cayley- Hamilton theorem, Schwartz inequality, Gramschmidt orthogonalisation process. Solve the system of simultaneous linear equations.
	Statistics -II	Students will able to Define Moments Skewness and Kurtosis. Fit a straight line. Calculate the correlation coefficient for the given data. Compute Rank correlation for the given data.	Students will able to Define attributes, consistency of data, independence of data. Find index numbers for the given data. Define Probability, Conditional probability. Derive Baye's theorem.
	Trignometry Fourier series and Laplace Transforms	Students will able to Expand sinnθ, cosnθ and tannθ by using Demoivre's theorem. Expand cosnθ, sinnθ and tannθ in	Students will able to Find Fourier series expansions for given functions. Find Cosine and Sine series expansions for given functions. Find the Laplace transform of

		terms of θ. Define hyperbolic functions. Define inverse hyperbolic functions.	various functions
III B.Sc	**Complex Analysis**	Students will able to Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers. Calculate exponentials and integral powers of complex numbers. Write equation of straight line, circle in complex form Define reflection points, concyclic points, inverse points. Understand the significance of differentiability for complex functions and be familiar with the Cauchy-Riemann equations.	Students will able to Determine whether a given function is analytic. Define Bilinear transformation, cross ratio, fixed point. Write the bilinear transformation which maps real line to real line, unit circle to unit circle, real line to unit circle. Find parametrizations of curves, and compute complex line integrals directly. Use Cauchy's integral theorem and formula to compute line integrals. Represent functions as Taylor, power and Laurent series. Classify singularities and poles. Find residues and evaluate complex integrals, real integrals using the residue theorem.
	Number Theory	Students will able to Illustrate the Division and Euclidean Algorithm. Describe the properties of prime numbers. Show that every positive integer can be expressed as product of prime power in unique way. Write a formula for the number of positive integers less than n that are relatively	Students will able to Find the Sum, product of all the divisiors of N. Find the smallest number with N divisors. Solve the system of linear congruences. State Chinese Remainder Theorem, Fermat's and Wilson's theorem

		prime to n. Define congruences and describe the properties of congruences	
	Graph theory	Students will able to Describe the origin of Graph Theory. Illustrate different types of graph theory. Explain independent sets and covering sets and some basic theorems. Discuss degree sequences and operations on graphs. Explain connectedness and components and some theorems.	Students will able to Derive some properties of planarity and Euler's formula. Find chromatic number and chromatic polynomials for graphs. Prove Five colour theorem. Explain basic properties of directed graphs.
	Dynamics	Students will able to Define Projectile, impulse, impact and laws of impact.Prove that the path of a projectile is a parabola. Find the direct and oblique impact of smooth elastic spheres.	Students will able to Define Simple Harmonic Motion and find its Geometrical representation.Find the Composition of Simple Harmonic Motion and the differential equation of a central orbit.Find the law of force if the orbit is given and vice versa.
	Numerical Methods	Students will able to Define Basic concepts of operators Δ,E, ∇. Find the difference of polynomial. Solve problems using Newton forward formula and Newton backward formula. Derive	Students will able to Derive Simpson's 1/3 ,3/8 rules using trapezoidal rule. Find the solution of the first order and second order equation with constant coefficient. Find the summation of series finite difference techniques. Find the solution of ordinary

		Gauss's formula and Stirling formula using Newton forward formula and Newton backward formula. Find maxima and minima for differencial difference equation	differential equation of first by Euler,Taylor and Runge-Kutta methods
	Astronomy -II	Students will able to understand the sky, moon linking with maths	For the young scientists in maths, this subject is a great succeeding interest one.
	Operations Research -II	Students will able to Define nature and feature of Operations Research. Find the replacement period of equipment that fails suddenly/gradually. Define EOQ. Find inventory decisions costs using deterministic inventory problems with no shortages /with shortages. Find EOQ problems with price breaks	Students will able to Define CPM and PERT. Define basic components of Network and find critical path. Define queue charecteristics , transient and steady state. Define Kendal notations solution of queue models (M/M/1):(∞/FIFO), (M/M/1):(N/FIFO). Define Two persons sum games ,maximin-minimax principle, saddle points.Find graphical solution of 2×n and m×2 games. Find general solution of m×n rectangular games
I M.Sc	**Algebra -II**	Students will able to Define Vector Space, Quotient space Direct sum, linear span and linear independence, basis and inner product. Discuss the linear transformations,	Students will able to Find the characteristic equation, eigen values and eigen vectors of a matrix. Prove Cayley- Hamilton theorem, Schwartz inequality, Gramschmidt orthogonalisation process. Solve the system of simultaneous linear equations

		rank, nullity.	
	Analysis -II	Students will able to Define countable, uncountable sets. Write Holders and Minkowski inequality. Define and recognize the concept of metric spaces, open sets, closed sets, limit points, interior point. Define and Illustrate the concept of completeness	Students will able to Determine the continuity of a function at a point and on a set. Differentiate the concept of continuity and uniform continuity. Define connectedness. Describe the connected subset of R. Define compactness.
	Classical Mechanics	Students will able to learn and link this subject with physics	Students will able to do the research area in problematic as well as theoretical.
	Differential Geometry	Students will able to Find Maxima and minima of function of two variables. Explain subtangent and subnormal. Find angle of intersition of two curves. Find circle, radius and centre of curvature.	Students will able to Solve Basic Integral Calculus problems. Explain properties of definite integrals. Prove reduction formulae and solve some problems by using this formulae. Evaluate double and triple integrals. Apply change variable method to find the value of double and triple integral.
	Graph theory	Students will able to Describe the	Students will able to Derive some properties of

		origin of Graph Theory. Illustrate different types of graph theory. Explain independent sets and covering sets and some basic theorems. Discuss degree sequences and operations on graphs. Explain connectedness and components and some theorems.	planarity and Euler's formula. Find chromatic number and chromatic polynomials for graphs. Prove Five colour theorem. Explain basic properties of directed graphs.
	Partial Differential Equations	Students will able to Extract the solution of differential equations of the first order and of the first degree by variables separable, Homogeneous and Non-Homogeneous methods. Find a solution of differential equations of the first order and of a degree higher than the first by using methods of solvable for p, x and y. Compute all the solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable coefficients. Solve simultaneous linear equations with constant	Students will able to Form partial differential equations. Find the solution of First order partial differential equations for some standard types. Use inverse Laplace transform to return familiar functions. Apply Laplace transform to solve second order linear differential equation and simultaneous linear differential equations.

		coefficients and total differential equations.	
II M.Sc	**Functional Analysis**	Students will able to understand various functions characterization and properties	Students will able to do the lot in the area of analyzation in Functional.
	Complex Analysis	Students will able to Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers. Calculate exponentials and integral powers of complex numbers. Write equation of straight line, circle in complex form Define reflection points, concyclic points, inverse points. Understand the significance of differentiability for complex functions and be familiar with the Cauchy-Riemann equations.	Students will able to Determine whether a given function is analytic. Define Bilinear transformation, cross ratio, fixed point. Write the bilinear transformation which maps real line to real line, unit circle to unit circle, real line to unit circle. Find parametrizations of curves, and compute complex line integrals directly. Use Cauchy's integral theorem and formula to compute line integrals. Represent functions as Taylor, power and Laurent series. Classify singularities and poles. Find residues and evaluate complex integrals, real integrals using the residue theorem.
	Advanced Algebra - II	Students will able to Define subgroup, center, Normalizer of a subgroup. Find cycles and transpositions of a given permutations. Prove Lagrange's theorem ,Euler's theorem and Fermats theorem.	Students will able to Prove a group has no proper subgroup if it is cyclic group of prime order. Define normal subgroups , quotient groups and index of a subgroup. Define homomorphism ,kernel ofa homomorphism,isomorphism. Prove Cayley's theorem , the fundamental

		Define cyclic groups .	theorem of homomorphism for groups Define rings , zero divisors of a ring , integral domain , field and prove theorems
	Topology - II	Students will able to prove all analysis ideas in Topologysets	Students will able to do research in many areas of Topology
M.Phil	**Advanced Algebra**	Students will able to Prove Cayley- Hamilton theorem, Schwartz inequality, Gramschmidt orthogonalisation process. Solve the system of simultaneous linear equations.	Students will able to Define normal subgroups , quotient groups and index of a subgroup. Define homomorphism ,kernel ofa homomorphism,isomorphism. Prove Cayley's theorem , the fundamental theorem of homomorphism for groups. Define rings , zero divisors of a ring , integral domain , field and prove theorems
	Advanced Analysis	Students will able to Define countable, uncountable sets. Write Holders and Minkowski inequality. Define and recognize the concept of metric spaces, open sets, closed sets, limit points, interior point. Define and Illustrate the concept of completeness	Students will able to Determine the continuity of a function at a point and on a set. Differentiate the concept of continuity and uniform continuity. Define connectedness. Describe the connected subset of R. Define compactness
	Graph Theory	Students will able to Describe the origin of Graph Theory. Illustrate different types of graph theory.	Students will able to Derive some properties of planarity and Euler's formula. Find chromatic number and chromatic polynomials for graphs.

		Explain independent sets and covering sets and some basic theorems. Discuss degree sequences and operations on graphs. Explain connectedness and components and some theorems.	Prove Five colour theorem. Explain basic properties of directed graphs.

Department of Physics

Sr.No.	Program	Program objectives	Program specific objectives
1	B Sc. Physics	PO1. CRITICALTHINKING The curriculum is designed in such way that students should acquire the ability to observe the concepts accurately and think impartially, scientifically, independently and draw rational conclusions. PO2. EFFECTIVE COMMUNICATION The medium of instruction for this course is in English. English is an international language therefore students should become habitual to communicate in English while studying physics. PO3 SOCIAL INTERACTIONS In this course students are made aware of environment related issues. P04 EFFECTIVE CITIZENSHIP In this program students are made aware of the pollution problems such as waste water management, water treatment etc. Also they made aware of significance of energy, water, food, fuels,	PSO1 To provide the basic principles of all branches of physics, knowledge of laws of Physics and make them independent for the effective application of it. POS 2 To provide knowledge of laboratory skills so that students can prepare for the experimental setup, actual working of equipments, obtain experimental data and interpretation of it and interpret using theoretical principles. PSO3 To make the students self sufficient in understanding and handling the various issues that may arise while studying physics.

		general hygiene and cleanliness etc. PO5 ETHICS In this program students made alert regarding misuse of electricity, maintenance of electrical and electronic appliance and nuclear weapons PO6 ENVIRNMENT AND SUSTAINABILITY Being Physics students they become well conversant with various pollutants their sources and their impact on bio- system. So they become well-informed with protection and conservation of environment. PO7 SELF DIRECTED AND LIFE LONG LEARNING Program curriculum inculcates the curiosity and problem solving approach which makes them self directed and learning becomes a continuous process throughout the life.	

Courses offered – Under graduate Physics

Sr.No	Class	Course	Course Outcomes
1	B.Sc. Physics Semester I	Mechanics & Relativity SMPH11	Students learn about a basic knowledge about mechanics and solving the physical problems.
2		Properties of Matter and Acoustics SMPH12	The students learn about modulus of elasticity , viscosity and sound
3		Practical-I SMPHP1	The students learn about modulus of elasticity, viscosity and surface tension of liquids. They get the experimental knowledge about these practicals.
4	Semester II	Thermal Physics & Statistical Mechanics SMPH21	The students can learn and understand about heat and temperature of the molecules get knowledge about the distribution of gas molecules in various states.
5		Optics SMPH22	The students can learn about dispersion , deviation , interference polarization, diffraction and laser applications
6		Practical II SMPHP2	The students learn about properties of light and heat using spectrometer, grating, lee's disc and Newton's law of cooling.

7	Semester III	**Electricity** **SMPH31**	Students learn about a basic knowledge about electricity and various methods of analyzing electric circuits with d.c. and a.c. sources. This paper does not require any special prerequisite except the basic ideas on electricity at the school level and learners are expected to gain knowledge to design and characterize electric circuits

8		Skill Based Maintenance of electrical Appliances SSPH3A	This course enable the students to understand the operations and safety handling of certain commonly used domestic appliances. The paper needs a basic knowledge in electricity and magnetism and the learners are expected to gain knowledge to design and trouble shoot electrical circuits
9		Practical III SMPHP3	To learn physical concepts through experiments. The students learn about resonance frequency using series and parallel circuit, comparison of magnetic moments using Tan A & Tan B position. Comparison of capacitances using B.G. Calibration of ammeter and voltmeter using potentiometer.
10	Semester IV	Electro Magnetism SMPH41	The Students understanding of magnetic effects of electric currents and the basics of electromagnetic waves. The paper does not need any special pre requisite except the basic ideas on electricity and magnetism at the school level and the learners are expected to know the device applications of electromagnetic induction.
11		Skill Based –Maintenance of electronic equipments & Photography SSPH4A	This course is to provide a basic understanding of the commonly used electronic equipments.

12		Practical IV SMPHP4	To learn physical concepts through experiments. The students get experimental knowledge through these practicals. The practicals are done using potentiometer and spectrometer.
13	Semester V	Basic Electronics	Students understanding of circuit analysis semiconductor diode and transistor circuits and the basics of operational amplifier. Thepaper does not need any special pre requisite except the basic ideas on Electricity and Electronics at the school level and the learners are expected to gain knowledge to analyse and design electronic circuits
14		Programming in C^{++}	This course is to provide knowledge about the basics of Computer programming in C++ and to solve problems by writing programs. The paper does not need any special prerequisite and the learners are expected to come out with the ability to apply the computer language **C++ to** solve problems .
15		Atomic Physics	This course provides an introductory account about the atomic structure and the impact of X-rays. This paper does not need any special prerequisite except the basic understanding of materials at the school level and the learners are expected to know the various atom models and the importance of X-rays in exploring the atomic structure

16		Elective I Spectroscopy	This course facilitates an understanding of atomic and molecular spectra and the instrumentations .The paper needs a basic knowledge about atomic structure and the learners are expected to gain knowledge to identify materials with the help of various spectra
17		Elective II Communication Electronics	This course enable the students to understand various modulation and demodulation techniques used for communication. The paper needs a basic knowledge in electronics and mathematics and the learners are expected to come out with the ability to choose proper modulation techniques .
18		Practical V Non Electronics	The students understand the concepts of non-electronic experiments using B.G, spectrometer and potentiometer.
19		Practical VI Electronics	The students understand the concepts of electronic experiments using op-amp, Zener diode, oscillator and transistors.
20	Semester VI	Digital Electronics	This course provides an understanding of Boolean algebra and digital circuits. The paper need a basic knowledge in solid state electronics and the learners are expected to gain knowledge to design electronic circuits

21		Quantum Mechanics	This course is to introduce wave- particle duality of matter and the formation of Quantum mechanics. The paper need a basic knowledge in Mathematics and Modern physics and the learners are expected to know the application of basic equations in quantum mechanics to various states
22		Nuclear Physics	This course is to provide the basics of atomic nucleus and nuclear reactions. The paper needs a basic knowledge in modern physics and the learners are expected to know the impact of nuclear reactions to the environment.
23		Solid State Physics	This paper is to introduce crystals and nano particles and to provide an understanding about different types of materials .The paper needs a basic knowledge of elements of modern physics and the learners are expected to get some ideas on Materials Research.
24		Energy Physics	This course is to provide an understanding of the present energy crisis and various available energy sources .The paper does not need require any special prerequisite and the learners are expected to know the use of alternate energy sources
2525		Practical VII Non Electronics & Electronics	The students understand the concepts of non-electronic & electronic experiments using B.G, spectrometer, potentiometer op-amp, Zener diode, oscillator and transistors.

		Practical VIII Computer programming with C++	This course is to provide knowledge about the basics of Computer programming in C++ and to solve problems by writing programs and doing practicals.

Program offered – Post Graduate

Sr. No	Program	Program objectives	Program specific objectives
1	M Sc. Physics	PO1. CRITICAL THINKING It is intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing or evaluating information gathered from or generated by observations, experience, reflection, reasoning or communication as a guide to belief and action. The students of physics are progressively trained along these lines. PO2. EFFECTIVE COMMUNICATION It is two ways information sharing process which involves successfully delivering the intended message. Thus the students can deliver their knowledge of physics to the society using English or other suitable relevant language. PO3 SOCIAL INTERACTIONS This programe enable the students to understand the	PSO1 To develop the post graduate department on the modern lines of education and training levels. PSO2 To impart the advanced practical and theoretical knowledge to the students and develop the scientific skills among them to be useful in the concerned field. PSO3 To trained students and make them eligible for accessing integrated multidimensional fields. POS4

		operations and safety handling of certain commonly used domestic appliances. The paper needs a basic knowledge in electricity and magnetism and the learners are expected to gain knowledge to design and trouble shoot electrical circuits P04 EFFECTIVE CITIZENSHIP In this program students are made aware consumption of electricity, usage of technology etc. They are also made aware of importance of	Anticipation of new/upcoming areas in academics as well as in technology.
		energy ,general hygiene and cleanliness etc. PO5 ETHICS It includes practice of moral principles that govern the person's behavior or conducting an activity. During the teaching of this course, various physical properties are discussed and also their beneficial and/or adverse effects on the human race/living world are also discussed. PO6 ENVIRONMENT AND SUSTAINABILITY It is state in which the demands placed in environment can be made without reducing its capacity to all the people to leave well now in future. In post graduate teaching a special course entitled energy physics which especially stresses these issues considering the environmental friendly processes and products is discussed with the students.	

		PO7 SELF DIRECTED AND LIFE LONG LEARNING Program curriculum inculcates the curiosity; critical thinking and problem solving approach so as to reach the rational conclusions among the students making them self directed and thus learning becomes a continuous process throughout their life.	

Courses offered –Post graduate Physics

Sr.No	Class	Course	Course Outcomes
1	M.Sc Physics Semester-I	Classical Mechanics PPHM11	The course aims to provide fundamental understanding of Classical Mechanics; students learn the concept of Gibbs and Helmholtz energies, Fundamental Principles and Lagrangian Formulation, Motion Under a Central force : Two body problem, Rigid Body Dynamics, Rigid Body Dynamics, mechanics of Small Oscillations,etc
2		Mathematical Physics I PPHM22	The student can understand the physical problems by applying mathematical concepts using vector, matrices, Fourier integral and special functions
3		Integrated Electronics PPHM13	The students get knowledge in electronics by various devices like FET, OP-Amp, timer 555, and electronic measurement and control
4		Nonlinear Dynamics PPHM14	The students get knowledge and understand the nonlinearity of the physical properties by studying bifurcations, chaos and fractals

5		Practical General Physics Experiments I PPHL11	The students understand the concepts of non-electronic experiments using B.G, spectrometer and potentiometer.
6		*Practical Electronics Experiments – I* PPHL12	The students understand the concepts of electronic experiments using op-amp, Zener diode, oscillator and transistors.
7	M.Sc Semester- II	***Mathematical Physics II PPHM21***	The student can understand the physical problems by applying mathematical concepts using complex analysis, Group theory, Tensor analysis, partial differential equation and special functions
8		Condensed Matter Physics PPHM22	Students are make to aware of Crystallography and crystal binding, Lattice vibrations, Free electron theory, Energy bands and Semiconductor crystals, Dia, Para, Ferro and Anti ferro magnetism, Dia, Para, Ferro and Anti ferro magnetism
9		Microprocessor & Micro Controller PPHM23	This course gives the idea about 8085 programming in microprocessor and 8051 microcontroller.

10		Numerical Methods & C^{++} Programming PPHM24	The students can understand the numerical problems by studying various methods and also get the knowledge to write C++ programs for physics problems .
11		Field Work PPHT21	This course includes visit the various places and understand the reality of the studied matters inside the classroom.
12		Practical General Physics Experiments II PPHL21	The students understand the concepts of non-electronic & electronic experiments using B.G, spectrometer, potentiometer op-amp, Zener diode, oscillator and transistors.
13		*Practical Electronics Experiments – II* PPHL22	The students understand the concepts of electronic experiments using op-amp, Filter, Phase shift oscillator, code converter and analog computation.
14	M.Sc Semester- II	QuantumMechanics I PPHM31	This course imparts knowledge about wave functions and Schrodinger equations and matrix mechanics, Heisenberg uncertainity principle and different operators and certain solvable systems and various pictures involved in quantum mechanics. Basics of quantum mechanics are essential. Methods of solving some microscopic problems using quantum mechanical ideas are studied.
15		Electromagnetic Theory PPHM32.	The scope of this course is to impart the knowledge of Maxwell's equation, propagation of electromagnetic waves through various media including waveguides.

16		Statistical Mechanics PPHM33	The basic concepts involved in statistical mechanics, classical and quantum statistics, applications of quantum statistics, phase transition in certain physical problems is expected to study. The theory of statistics and quantum ideas are prerequisites. Postulates of quantum mechanics, Maxwell-Boltzmann distribution law, theory and applications of quantum statistics are studied.
17		Research Methodology PPHM34	Literature collection, activities involved in the research problem, method of writing the thesis, knowledge about Origin and Latex are expected to learn. Different methods of analysis and computer knowledge are prerequisites. The outcome of the course is how to collect literatures, write the research article and thesis.
18		Practical Advanced Physics Experiments I PPHL31	It is expected to provide hands on experience in understanding the advanced physics experiments Gouy's method, elliptical fringes, Hall probe into Gauss meter, and Phototransistor characteristics. Basic skills and knowledge about the experiments is required. Experiments in magnetism, electricity, and the theory behind the experiments are also studied.
19		Practical Microprocessor Experiments PPHL32	This course provide hands on experience on microprocessor experiments. Learners are expected to give a detailed knowledge of arithmetic operation, data manipulation, interfacing experiments, ADC & DAC conversion etc…

20	M.Sc. –II Semester IV	QuantumMechanics I I PPHM41	The course provides knowledge on the theory of angular momentum, various approximation methods, and theory of scattering and relativistic quantum theory. The various aspects studied in the course quantum mechanics I is essential. This course is capable of solving many problems that cannot be exactly solved
21		Spectroscopy PPHM42.	This course gives detailed knowledge about various types of spectroscopy. The structure of different chemical compounds can be determined by studying these types.
22		Nuclear and Particle Physics PPHM43	This course imparts knowledge about the elementary particles, nuclear structure, nuclear reactions with the help of various nuclear models.
23		Elective –Study Tour PPHE4L	This course includes visit the various places and understand the reality of the studied matters inside the classroom.
24		Practical Advanced Physics Experiments I PPHL41	It is expected to provide hands on experience in understanding the advanced physics experiments Hall effect, Hysteresis, Ultrasonic diffraction etc… Basic skills and knowledge about the experiments is required. The theory behind the experiments is also studied.
25		Practical C^{++} Programming PPHL42	The course provides knowledge about the C++ programming and the course is able to solve many tedious physical problems numerically.

26		Project PPHL41	This course makes the students to aware of research skills by doing research in different fields in physics

Programs offered –Ph.D.

Sr. No	Program	Program objectives	Program specific objectives
1	Ph.D Physics	PO1. To provide an excellent and high class environment for working in frontline research areas as per the national and International standards and adding the real values to the academic, medicinal and industrial sectors of development.	It develops the sense of curiosity and courage to question the existing information and knowledge. It aims at exploring and following newer methods to improve the existing solutions to the problems. It involves exercising imagination and innovative ideas.

Department of Chemistry

Programme Under graduate

Sl.No	Programme	Program objectives	Program specific objectives
1	B Sc. Chemistry	**PO1. CRITICALTHINKING** The curriculum is designed in such way that students should acquire the ability to observe the concepts accurately and think impartially, scientifically, independently and draw rational conclusions. **PO2. EFFECTIVE COMMUNICATION** The medium of instruction for this course is in English. English is an international language therefore students should become habitual to communicate in English while studying chemistry. **PO3 SOCIAL INTERACTIONS** In this course students are made aware of environment related issues. They are made aware of optimal use of fertilizers, water, fuels and drugs. In this program students made alert regarding misuse of food adulteration, chemical technology, poisons, fungicides, pesticides and chemical and nuclear weapons	**PSO1** To provide the basic principles of all branches of chemistry, knowledge of chemical principles and make them independent for the effective application of it. **POS 2** To provide knowledge of laboratory skills so that students can prepare for the experimental setup, actual working of equipments, obtain experimental data and interpretation of it and interpret using theoretical principles. **PSO3** To make the students self sufficient in understanding and handling the various issues that may arise while studying chemistry.

		P04 EFFECTIVE CITIZENSHIP In this program students are made aware of the pollution problems such as waste water management, water treatment etc. Also they made aware of significance of energy, water, food, fuels, general hygiene and cleanliness etc. **PO5 ENVIRNMENT AND SUSTAINABILITY** Being Chemistry students they become well conversant with various pollutants their sources and their impact on bio- system. So they become well-informed with protection and conservation of environment. **PO6 SELF DIRECTED AND LIFE LONG LEARNING** Program curriculum inculcates the curiosity and problem solving approach which makes them self directed and learning becomes a continuous process throughtout the life.	

Courses offered – under graduate Chemistry

Sl.No	Programme	Course	Course outcomes
1	**I .B.Sc.**	Paper I Physical Chemistry(SMCH12)& Inorganic	This course includes basic laws regarding states

	Chemistry (I & II sem)	chemistry (SMCH11)	of matter, structure of atom, surface chemistry, Catalysis and thermodynamics. Students are also made aware of mole concept, derivations and periodic properties of the elements, depictions and problem solving, including the preliminary theories of bonding, oxidation and reduction.
		Paper II Organic Chemistry (SMCH22) & Inorganic chemistry (SMCH21)	Students are enable to understand fundamental concepts of organic and inorganic chemistry which govern the structure, bonding, properties, structural effects, acid-base theories, preparation methods, reactivity and stereochemistry of organic molecules.
		Paper III **Practical** ChemistryI Volumetric analysis I (SMCHP2) **Practical** II Volumetric Analysis II (SMCHP2)	Chemistry practical course is intended to achieve the basic skills required for understanding the concepts, authenticating the basic laws and principles of chemistry & helps in the development of practical skills of the students. The practical syllabus includes preparation, qualitative and qualitative analysis.
2	**II.B.Sc. Chemistry (III & IV**	Organic Chemistry SMCH31	Students learn the basics of organic chemistry and some organic compounds. The reaction mechanism in which they study different types

	sem)		of reagents, reactions and their mechanisms also studied. They learn about carbon related compounds, difference between organic and inorganic compounds and their applications in various fields.
		Agro Chemistry SSCH3A	Students are learning about the need of agriculture and the chemicals used in agriculture. They learn about fertilizers, pesticides, insecticides etc. They also get the knowledge about the types of soil and fertility of soil.
		Herbal Medicine SNBO3B	Students learn about various medicinal plants and their medicinal value. They are trained for the home remedy and herbal remedy of various diseases. Morphology of some medicinal plants was studied. They get idea about herbal hair care and skin care and how to prepare some herbal oil and shampoo.
		Physical Chemistry SMCH41	Students learn concepts of Helmholtz free energy & Gibbs free energy as well as free energy of chemical reactions & physical transformation. Students also study different modes of concentration, distillation

			of solutions of liquid in liquid, partially immiscible liquids & distillation of immiscible liquids. Students introduced to volumetric analysis wherein they study non- instrumental volumetric analysis which comprises with the study of various titrations, indicators used in it & some theoretical aspects related with titrations.
		Chemistry in Medicine SSCH4A	Students are introduced to various medicines, their role & structural aspects. Students also study different medicines used to cure various diseases and their effect on living beings. The selectivity of various medicines to different substrates, heterocycles, their preparation & reactions are also studied. They also study chemical toxicology to know adverse effects of chemicals.
		Food and nutrition SNBO4A	Students learn about various food sources and their nutritive values. The various diseases caused by the deficiency of nutrition were known to the students. The concept of malnutrition and under nutrition was learnt by

			students.
		Practical course (Sem III& IV)	Students trained for quantitative estimation of different samples by various types of titrations such as acidimetry&alkalimetry, iodometry, complexometry etc. The principle and concept behind these titrations are understood by the students.
3	**III B.Sc. Chemistry (V & VI sem)**	Physical Chemistry SMCH52	In physical chemistry course they learn methods to determine order of reaction, Arrhenius equation and graphical evaluation of energy of activation. Students are introducing principle and applications of rotational, vibrational, Raman and electronic spectroscopy. Students will get familiar with electrolytic conductance phase rule, phase diagram of one and two component systems.
		Polymer Chemistry	The Students are introducing to the principles of formation of polymeric compound. They are also made aware of the principles of isomerism, nomenclature and structures of polymeric complexes.
		Organic Chemistry SMCH51	It is the basic course in organic chemistry. Students learn fundamental concepts like

			acidity, basicity of organic molecules, electrophile, nucleophile and leaving groups. Students aware with stereochemistry of disubstituted cyclohexane. Students are able to understand mechanism of organic reaction. Arrow drawing concept which is important part of reaction mechanism is explained thoroughly in this course. Students are able to identify different types of organic reactions and also they can understand reactivity profile of organic molecules.
		Pharmaceutical Chemistry	Students learn the causes and symptoms of various diseases. Differentiate the uses and side effects of different medicines.
		Personality Development	Students learn to develop self confident, self esteem, strength and weakness of themselves.
		Physical Chemistry SMCH63	The aim of the course is to give fundamental understanding and applications of electrochemical Cells, Nuclear Chemistry, Crystal structure and Quantum Chemistry. The course also includes thermodynamics and EMF, Chemical cell with and without transference, application of EMF

			measurement such as pH determination, determination of solubility and solubility product. Basic elements of quantum chemistry and crystallography are also introduced.
		Inorganic Chemistry SMCH62	Students learn chemistry of co-ordination compounds. Principles and applications of CFT, VBT. Organometallic chemistry and the principles and applications of metals, semiconductors and superconductors. It also includes the ionic solid and bioinorganic chemistry.
		Organic Chemistry SMCH61	The students introduced with carbanions and their reactions. New retro synthetic analysis concepts are explained to students. Rearrangement reactions are introduced with mechanism. Spectroscopic techniques like PMR, U.V. and I.R. are introduced. Students learned to differentiate organic compounds with the help of these spectroscopic techniques.
		Green Chemistry	The students learn water treatment, effluent management, soil and solid waste management. It also include instrumental

			method in environmental analysis minimize the environmental pollution. Students are making aware of green house effect, Global warming, energy and renewable energy sources.
		Physical Chemistry **practical**	Students are trained in the techniques such as pH metry, Conductometry and Potentiometry. They learn to use these techniques in order to understand various chemical reactions.
		Inorganic Chemistry **practical**	Students are trained in the IQA of different mixtures of inorganic compounds, and the separation of the metal ions using complexing techniques and inorganic quantitative analysis using the techniques of gravimetry and volumetry.
		Organic Chemistry **practical**	The practical course is designed to achieve the basic skills required for understanding the reactivity of organic molecules and validating the basic principles. It helps in development of practical skills of the students & understanding the importance of chemical safety and also explains the factors affecting reaction outcomes

			and yields.

Programme - Post Graduate

Sl.No	Programme	Program objectives	Program specific objectives
1	M Sc. Chemistry	**PO1. CRITICAL THINKING** It is intellectually disciplined process of actively and skilfully conceptualizing, applying, analyzing, synthesizing or evaluating information gathered from or generated by observations, experience, reflection, reasoning or communication as a guide to belief and action. The students of chemistry are progressively trained along these lines. **PO2. EFFECTIVE COMMUNICATION** It is two ways information sharing process which involves successfully delivering the intended message. Thus the students can deliver their knowledge of chemistry to the society using English or other suitable relevant language. **PO3 SOCIAL INTERACTIONS** In this post-graduate course students are made aware of environment related topics like drugs fertilizers, industrial chemicals etc. They are made aware of optimal use of these substances and are expected to spread this	**PSO1** To develop the post graduate department on the modern lines of education and training levels. **POS 2** To impart the advanced practical and theoretical knowledge to the students and develop the scientific skills among them to be useful in the concerned field. **PSO3** To train the students and make them eligible for accessing integrated multidimensional fields. **POS4** Anticipation of new/upcoming areas in academics as well as in technology.

		knowledge in the society. **P04 EFFECTIVE CITIZENSHIP** In this program students are made aware of pollution problems waste water management, water treatment etc. They are also made aware of importance of energy and water, food, fuels, general hygiene and cleanliness etc. **PO5 ENVIRNMENT AND SUSTAINABILITY** It is state in which the demands placed in environment can be made without reducing its capacity to all the people to leave well now in future. In post graduate teaching a special course entitled Green Chemistry which especially stresses these issues considering the environmental friendly processes and products is discussed with the students. **PO6 SELF DIRECTED AND LIFE LONG LEARNING** Program curriculum inculcates the curiosity, critical thinking and problem solving approach so as to reach the rational conclusions among the students making them self directed and thus learning becomes a continuous process throughout their life.	

Courses offered –Post graduate Chemistry

Sl. No	Programme	Course	Course outcomes
1	**I M.Sc. Chemistry Sem I**	Physical Chemistry I (PCHM13)	The course aims to provide fundamental understanding of physical chemistry; students learn the concept of Gibbs and Helmholtz energies, Chemical potential and Expressing Chemical equilibrium in terms of chemical potential.. Students are made aware of Chemical kinetics and reaction dynamics topics such as Reversible reactions, principle of microscopic reversibility, steady state approximation and elucidating mechanism using SSA.
		Inorganic Chemistry (PCHM12)	This is made to understand the symmetry and group theory and use this knowledge to interpret the properties like dipole moment, optical activity, and signals in IR and Raman spectroscopy. Students are also made to understand the properties of main group elements and their applications in fields like catalysis, industry, human metabolism and medicines etc. It also explains organometallic compounds of Si, Sn, Pb, Ga, As, Sb, Bi etc and their synthesis and reactions.
		OrganicChemistry I (PCHM11)	This course helps to improve basic organic concepts. The purpose of the course is to aware the students for basic organic chemistry , The main intension of the course is that to know stereochemistry of carbon compounds, how to write structure of molecules & their reactivity. Student should aware about reaction mechanism.
		Advanced Topics in Chemistry- I	The course aims to provide fundamental understanding of nano chemistry; students learn the concept of green chemistry and applications of

		PCHE 11	electrochemistry.
	I M.Sc Practicals Sem I	Organic Chemistry I (PCHL11) InOrganic Chemistry I (PCHL12) Physical Chemistry I (PCHL13)	The practical course is designed to achieve the basic skills required for understanding the reactivity of organic ,inorganic and physical validating the basic principles. It helps in development of practical skills of the students & understanding the importance of chemical safety and also explains the factors affecting reaction outcomes and yields.
	I M.Sc. Chemistry Sem II	Physical Chemistry II (PCHM23)	The course aims to provide to understand the concepts of quantum chemistry
		Inorganic ChemistryII (PCHM22)	Students are made aware of spectral and magnetic properties of d and f block elements, spectrophotometric analysis of metals like Cr, Mn, Ni and magnetic behaviour of various complexes of f block elements in MRI and as TV phosphors. Students are also made aware of a role of metal ion in biologically active compounds like Hb, Mb cytochromes and use of anticancer drugs i.e. platinum complexes.
		Organic Chemistry (PCHM21)	The main aim of this course is to study with various basic organic reactions with mechanism, reagent and ylides. This course also covers with the basic introduction to various spectroscopic methods like UV, ^{1}H-NMR, ^{13}C- NMR, IR, Mass spectrometry and their applications.
		Advanced Topics in Chemistry- I	The basic purpose of this course is to understand the importance and properties of mass spectrometry, gas chromatography and high performance liquid

		PCHE 21	chromatography. Students also familiar with concept of analytical chemistry like data handling and spreadsheets, Sampling, standardisation and calibration, separation by precipitation, distillation, extraction and ion exchange chromatography.
	I M.Sc Practicals Sem II	Organic Chemistry I (PCHL21) InOrganic Chemistry I (PCHL22) Physical Chemistry I (PCHL23)	This course makes the students to aware of different organic techniques like purification, crystallization, distillation, organic preparation and also give knowledge of separation of organic mixtures. Students are given the knowledge of basic preparation of various solutions, synthesis of various inorganic complexes and their characterization. The students are trained for handling of natural materials and their quantitative analysis which involves disintegration, separation and individual estimations. Students are trained to use the techniques such as pH metry, Conductometry, Potentiometry, colorimetry, These techniques will enable them to work as quality control chemist in various labs and such organizations.
2	**II M.Sc. Chemistry Sem III**	Organic Chemistry (PCHM31)	The main aim of this course is to learn and understand the basic concept in reaction mechanism. This course helps the students to understand the role of recent reagent, catalyst in mechanism of reaction. This course also helps to improve the thinking ability of the students towards reaction mechanism.

		Inorganic Chemistry III (PCHM32)	This course enables to the students learn the basic of spectroscopic methods like UV, ^{1}H-NMR, IR, Massbauer spectrometry and their application. This course gives idea of structure determination of known and unknown inorganic molecules by using spectroscopic data.
		Physical Chemistry III (PCHM33)	This provide a clear idea about Group Theory of molecules
		Elective Scientific Research methodology PCHE31	The aim of this course is to furnish the students with fundamental and theoretical understanding of research and instrumentations.
	II M.Sc Practicals Sem III	Organic Chemistry III (PCHL31) Inrganic Chemistry III (PCHL32) Physical Chemistry III (PCHL33)	The practical course is designed to achieve the basic skills required for understanding the reactivity of organic ,inorganic and physical validating the basic principles. It helps in development of practical skills of the students synthesis of natural products it also helps stereochemistry and also explains the factors affecting reaction outcomes and yields
	II M.Sc. Chemistry Sem IV	Organic Chemistry IV PCHM41	This course involves organometallic chemistry which helps the students to develop their ideas in organic synthesis. This course involves the reactions like coupling reactions, multicomponent reactions, ring formation reactions, olifination which helps the students to plan synthesis of new organic molecules
		Inorganic	This course is designed to make the students aware of the chemistry of

		Chemistry IV PCHM42	Medicinal chemistry helps to introduce the drugs and their biological properties to the students.It also helps to understands pharmacokinetics and pharmacodynamics of the drugs and drug targets.
		Physical Chemistry IV PCHM43	This course covers with the basic introduction and theory of various spectroscopic methods like Rotational, vibrational, IR& Raman NMR, and their applications.
	II M.Sc Practicals Sem IV	Organic Chemistry III (PCHL41) Inorganic Chemistry III (PCHL42) Physical Chemistry III (PCHL43)	This practical course involves double stage preparation of different organic compounds .The main objective of this course is to develop technical skill of the students in laboratory.

Programme offered –Ph.D.

Sl.No	Programme	Program objectives	Program specific objectives
1	**M.Phil/Ph.D Chemistry**	**PO1. CRITICAL THINKING** To provide an excellent and high class environment for working in frontline research areas as per the national and International standards and adding the real values to the academic, medicinal and industrial	**PSO1** It develops the sense of curiosity and courage to question the existing information and knowledge. It aims at exploring and following newer methods

		sectors of development.	to improve the existing solutions to the problems. It involves exercising imagination and innovative ideas.

Computer Science

Program	Course	Course outcomes	Specific outcomes
I B.Sc Computer Science	Programming in C	• To know the proper lines of C++, Encapsulation, Inheritance and Polymorphism. • Describe the concept of inheritance and apply real world problems.	• To improve learners' write and execute the programs
	Object Oriented Programming with C++	• Explain about the basic concepts of program development statements and its syntax. • Explain the various types of arrays and its structure. • Explain the Concepts of structures and Unions.	• Apply problem-solving skills and the knowledge of computer science to solve real world problems.
	Digital Fundamentals and Architecture	• Discuss about gates and flip flops • Describe the fundamental circuits and components	• Students should have Knowledge on Digital circuits, Microprocessor architecture, and Interfacing of various components.

II B.Sc Computer Science	Java programming	• Describe the concepts of variables, conditional and iterative execution methods etc.	• Students would get knowledge on object-oriented programming in Java, including defining classes, objects, invoking methods
	Web technology	• Describe the concepts of markup languages, un order list, table, formatting, liking and frames. • Explain the JavaScript, control structure, if structure, switch, do-while and logical operators.	• Develop web page using script like Java, VB, PHP. • Develop web page using frame concepts with multi-media handling.
	Visual Basic	• Discuss about graphics handling related control and properties. • Discuss about the fundamental functions and properties of Advanced ActiveX Control.	• Students would get knowledge on various functions and methods. • To enable students to create a software package using VB
	Python	• Apply language features including strings, lists, tuples, dictionaries, regular expressions.	• To Develop classes using OO features. • To Develop internet applications using packages .

	Computer Architecuture	• To gain knowledge about the architecture of computer • To understand the concept of CPU,ALU design IO Instruction	• Evaluate & Classify various types of *organization* structure
III B.Sc Computer Science	.Net Programming Language	• Create, compile and run object-oriented C# programs using Visual Studio. • Describe the reusable .NET components via interface realization and standard design patterns.	• Develop technical project reports and present them orally among the users
	Data Communication and Computer Network	• Discussion of various networking technologies. • Explain the concepts of protocols, network interfaces and design of performance issues in local area networks and wide area networks.	• Apply different encoding and decoding mechanisms involved in different types of transmission media and to measure the transmission impairments. • Design a model internet with various categories of networks and test the transmission rate
		• Describe the basic components of an operating	• Apply page replacement policies for dynamic

	Operating system	system and their role in implementations for general purpose, real-time and embedded applications.	memory management. • To enable the students understand scheduling algorithm for processors
	Computer graphics and Multimedia	• Develop clipping algorithms for point, line and polygons. • Learn the concepts of projections, viewing and graphics pipeline	• To develop a simple animation and interaction for multimedia presentation. • To make the learners understand image types and color models
	Cloud Computing	• To inculcate knowledge on network concepts.	• To enable the students understand transmitting data
I M.Sc Computer	Design and Analysis of Algorithms	• To know effective problem solving in computing. • Ability to analyze the performance of *algorithms*	• To illustrate clever and efficient ways to • Apply important algorithmic *design* paradigms and methods of *analysis*.
	Advanced Java Programming	• Design and develop Web applications • Designing Enterprise based applications by encapsulating an application's business logic.	• Students will design and implement *programs* in the *Java programming* language that make strong use of classes and objects. • Create dynamic web pages, using Servlets and JSP
		• To learn the working knowledge of hardware	• demonstrate knowledge of the core

Science	Distributed Computing	and *software* of computer. • understand *Distributed Systems, distributed computing*	architectural aspects of *distributed systems* • design and implement *distributed* applications;
	Web Application Development	• To provide students with an introduction to client and server-based Web scripting and dynamic *Web application*.	• Implement measures to create secure web sites • To Design, create, and process a database;
	Security in Computing	• Ability to understand the structure and development methodologies of *software* systems. • To possess professional skills and knowledge of *software* design process.	• To develop students as Cyber *Security* experts, Information System Auditors.
	Open Source Technology	• Ability to develop *programs* using object oriented concepts.	• To develop web page using validated controls.
II M.Sc Computer Science	Digital Image Processing	• understand the need for *image* transforms different types of *image* transforms and their properties	• Develop any *image processing* application analyze *images* in the frequency domain using various transforms.
	Soft Computing	• Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic • Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory	• learning rules for each of the architectures and learn several neural network paradigms and its applications

	Mobile Computing	• Describe infrastructures and technologies of mobile computing technologies.	• Effectively communicate course work through written and oral presentations.
	Research Methodology	• To enable the students to understand the research techniques.	• Students are exposed to various rules and techniques followed while writing a research article.

S.No.	Program	Program outcomes
1	B.Sc. Computer Science	• Data Entry operator • They can continue their higher studies • Web designer • Software Professionals • To use current techniques and tools necessary for computing practice. .
2	M.Sc Computer Science	• Software Developers • Computer Instructor

		• Design and computer programs in the areas related to networking, algorithm, web design, IoT of varying complexity.

Department of Biotechnology

Sr.No.	Program	Program objectives	Program specific objectives
1.	B.Sc Bio-Technology	1. PO1-Students get fundamental knowledge about the science of Bio-Technology. It has tremendous potential for application in agriculture and medicine. 2. PO2-The linkage between basic and applied research and new discoveries and innovations can find direct applications in Bio-Technology. 3. PO3-The breakthrough in modern biotechnology mainly include our ability to produce useful organisms through genetic engineering & cell fusion techniques and improve bioprocess technology to purify novel molecules generated by such processes. It also involves targeting drugs, development of delivery systems & vaccines. 4. PO4-Considering this background, the UG syllabus focused on diverse areas from cell biology, Biochemistry, Immunology, and Genetics with significant lab practices which will enable the students to have hands on experience in doing experiments themselves in M.sc programme.	1. PSO1. Understand the basic concepts of cell biology, genetics, biochemistry, genetic engineering, bioprocess technology & bioinformatics. 2. PSO2. Analyse the relationships among animals, plants and microbes through biodiversity. 3. PSO3. Perform procedures as per laboratory standards in the areas of Cell biology, Genetics, Applied biotechnology, Plant Biotechnology, Animal Biotechnology, Biochemistry, Animal biotechnology, and Immunology and Microbiology. 4. PSO4. Understand the applications of biological sciences in biomedical technology and Tissue Engineering. 5. PSO5. Get knowledge about research methodologies, effective communication and skills of problem solving methods.

2.	M.Sc Bio-Technology	1. PO1-Students get knowledge and skill in the fundamentals of Life sciences & understand the interaction among various living organisms. 2. PO2-Impart the knowledge of plant & animal molecular biology & Genetic Engineering. Students understand the concept and applications of stem cells. 3. PO3-Analyse the knowledge of biostatics and how to apply them in their research studies. Students once complete their M.sc course they can join in various industries located in TICEL BIOPARK at Chennai. In Hospitals and laboratories work as Lab Technician. 4. PO4-Those have Lab experience can work as Scientist. In JNU government institutes Research Associate, Research Assistant, PDF, JRF, SRF & also work as Medical coder, Medical Transcriptionist, Clinical Research Associate. 5. PO5-In Food processing industries those who have lab practices which will enable the students to have hands on experience as a Quality controller, Quality Analyst.	

Courses offered – under graduate Bio-Technology

Sr.N	Class	Course	Course Outcomes

o			
.	F.Y.B.Sc. Bio-Technology (Annual Pattern)	**1.Basicsof biodiversity& conservation.**	Understand basic principle and importance of Biodiversity**.** Need and means of conservation of biodiversity.Students can able to understand difference between plants, animals & microorganisms. Get knowledge on global warming. study the sustainable use of bio resources.
		2. Cell biology	Understands the basic concept of cell structure & cell organells. Various kinds of subcellular organells and cytoplasmic matrix.The students can be familiar with Laws of Mendel and population genetics.

		3.Biochemistry I	Basic concepts of biomolecules. understand the classification, structure & functions of biomolecules. Concept behind the genetic material.
		4.Instrumentation	Structural and functional aspects of basic unit of life. Understand the basic concept of preparation of Buffers & stock solutions. Inculcate the techniques and operation of the common instruments used in bioscience laboratories.
		5.Molecular biology	Seeks to understand the mechanisms and concept of central dogma of molecular biology. Regulation of gene expression and protein synthesis.
		6.Biochemistry II:	Students are taught the detailed concepts of acids and bases.Students gain fundamental knowledge of common laboratory techniques.
	S.Y.B.Sc. Bio-Technology	**Microbiology:** .	Students gain knowledge about various applications of microorganisms in different areas

	(Annual Pattern		
		Biophysics:	Study the significant aspects and bioenergetics of the living organisms. Students feel confident in teaching working principle of various instruments used in biotechnological experiments.
		Industrial biotechnology:	Imparts the Knowledge to processes of various microbial metabolites. Knowledge of industrial scale by use of microbes. Understand commercial importance of biotechnology in a variety of industrial processes.
		Immunology:	Interactions of antigens, antibodies, complements and other immune components. Imparts in depth knowledge of tissues, cells and molecules involved in host defence mechanisms Understanding of types of immunity. Understanding of immune mechanisms in disease control, vaccination, process of immune interactions.
		Biostatistics:	Understanding the aim of the course and develop skills of mathematical statistics. Gains skills of computer in the field of biology.
	Third Ye Bio-Technology (Annual Pattern)	**Genetic engineering**:	Understanding of in vitro culturing of organisms and production of genetically engineered products. Understanding of recombinant and related techniques. This insight allows students to take into consideration about ethical issues involved in production transgenic animals and BT products.

		Plant biotechnology:	Make the students to understand the concept and applications Students gain knowledge on plant tissue culture, plant molecular biology & plant genetic engineering.Students feel confident in teaching working principle of various instruments used in plant tissue culture experiments.
		Nano biotechnology .	Students are taught the basic concepts of nanobiotechnology.Students gain fundamental knowledge of principle & instrumentation of nanoparticles. Students will gain skill to execute the nano material in the field of medicine & scientific research
		Animal biotechnology:	Imparts the Knowledge to culture animal cells in artificial media. Get Knowledge of animal cells in culture, growth of cell lines. Use in recombinant DNA technology, genetic manipulations and in a variety of industrial processes. It gives insight into various cell/tissues culture techniques.Understanding of in vitro culturing of organisms and production of transgenic animals. This insight allows students to take into consideration about ethical issues involved in production transgenic animals and BT products.
		StemCell technology:	Students are taught the detailed concepts of stem cells.Students gain fundamental knowledge of common laboratory techniques.Students will gain awareness and enhance expertise with basics of stem cells.

		Bioprocess Technology:	Introduction to industrial applications of bioprocess technology.Knowledge of industrial scale by use of microbes.Understand commercial importance of biotechnology in a variety of industrial processes.
		Clinical research:	Provides knowledge of the basic steps in the drug research. Understands concepts of toxicological, preclinical and clinical studies.Apply the knowledge to collect various Biological data

Courses offered

S.NO	Class	Course	Course Outcome
1.	F.Year M.Sc Bio-Technology	**Cell biology**	Understands the basic concept of cell structure & cell organelles.Various kinds of sub cellular organelles and cytoplasmic matrix. The students can be familiar with different types of cell & Understand the model of transport across cell membrane and cell cycle.
		Biomolecules and microbial physiology	Basic concepts of chemical foundation of biomolecules & understand the classification, structure & functions of biomolecules. Study the Concept behind the microbial architecture & metabolism.
		Molecular biology & Genetics	Seeks to understand the mechanisms and concept of central dogma of molecular biology.Study the concept & Regulation of gene expression and protein synthesis.

		Principles of Biotechnology	Familiarize students with the fundamental principles of biotechnology & its potential applications.Knowledge of industrial scale by use of microbes.
		Biochemistry & Instrumentation:	Structural and functional aspects of basic unit of life.Students Understand the basic concept of preparation of Buffers & stock solutions.Inculcate the techniques of commercial production of enzymes.Study the kinetics of enzymes.
		Bioprocess Technology	Imparts the Knowledge to processes of various microbial metabolites.Knowledge of industrial scale by use of microbes. Understand commercial importance of biotechnology in a variety of industrial processes.
		Nanobiotechnology	Students are taught the basic concepts of nano biotechnology.Students gain fundamental knowledge of principle & instrumentation of nano particles. Students will gain skill to execute the nano material in the field of medicine & scientific research.
		Plant biotechnology:	Students gain knowledge on plant tissue culture, plant molecular biology & plant genetic engineering. Make the students to understand the concept and applications. Students feel confident in teaching working principle of various

			instruments used in plant tissue culture experiments.
		Animal biotechnology	Imparts the Knowledge to culture animal cells in artificial media. Knowledge of animal cells in culture, growth of cell lines Use in recombinant DNA technology, genetic manipulations and in a variety of industrial processes. It gives insight into various cell/tissues culture techniques Understanding of in vitro culturing of organisms and production of transgenic animals.
		Stemcell technology	Students are taught the detailed concepts of stem cells. Students gain fundamental knowledge of common laboratory techniques. Students will gain skill to execute the differentiation and applications of stem cells.
		Research methodology& Biostatistics	Students gain knowledge of biostatistics and how t apply them in their research studies. Students feel confident in teaching working principle of various concepts and significance. Understanding the aim of the course and develop skills of mathematical statistics.Gains skills of computer in the field of biology.
		Proteomics and genomics	Familiarize and expose the students to an overview of proteomics. Imparts in depth knowledge of expression, sequence analysis. Understanding of recombinant DNA technology.

		Biomedical technology	Imparts the theoretical and practical Knowledge about biomedical environment. Get the Knowledge of basic concept of molecular basis of diseases. It gives insight into various cell/tissues culture techniques.
		Industrial biotechnology	Imparts the Knowledge to processes of various microbial metabolites and get the Knowledge of industrial scale by use of microbes. Understand commercial importance of biotechnology in a variety of industrial processes.

Department of Zoology

PROGRAMME OUTCOMES:

1. Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms
2. Analyse complex interactions among the various animals of different phyla, their distribution their habit and their relationship with the environment
3. Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
4. Understands the complex evolutionary processes and behaviour of animals
5. Correlates the physiological processes of animals and relationship of organ systems
6. Understanding of environmental and wildlife conservation processes and its importance, pollution control and biodiversity and protection of endangered species
7. Gain knowledge of Agro based Small Scale industries like sericulture, fish farming, apiculture, poultry farming and vermicompost preparation.
8. Understands about various concepts of genetics and its importance in human health
9. Apply ethical principles and commit to professional ethics and responsibilities in delivering his duties
10. Apply the knowledge and understanding of Zoology to one’s own life and work
11. Develops empathy and love towards the animals

12. Develops awareness on research in different fields of Zoology.

13. Gains basic knowledge on Biostatistics, Computer Applications and Bioinformatics.

PROGRAM SPECIFIC OUTCOMES

S.N	Program	Program specific outcomes
1	B. Sc. Zoology	• Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology • 2Analyse the relationships among animals, plants and microbes • Perform procedures as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics,Applied Zoology, Toxicology, Sericulture, Biochemistry, Fish biology, Animal biotechnology, and Immunology and Microbiology. • Understand the applications of biological sciences in Apiculture, Aquaculture, • Gains knowledge about research methodologies, effective communication and skills of problem solving methods • Contributes the knowledge for Nation building. • Students can impart their role in taxonomy, environment, veterinary science, forensic science, pollution control, applied Zoology, museums, media related with animals, wild life management, etc..

COURSE OUTCOME

Programs	Course	Course outcomes	Specific outcomes
I B. Sc. Zoology	Animal Diversity – Invertebrata and Chordata	• Describe general taxonomic rules on animal classification • Classify Protista up to phylum using examples • Classify Phylum Porifera to Echinodermata with taxonomic keys • Describe Phylum Nematoda and give examples of pathogenic Nematodes • Classify the Chordates from Phylum to Class level. • Perform as a good animal taxonomist • Students can able to understand difference between protozoa and metazoan and the relationship between the invertebrates and	• Students could able to identify different species of vertebrates and invertebrates at generic level. • Students can become a good taxonomists

		Chordates • gain knowledge on method of nomenclature. • study the structure, functional organization, adaptations aand economic importance of lower and higher invertebrates and chordates.	
	Ecology and Toxicology	• Understand distribution of fauna in different realms interaction • Understand the toxic materials and its effects on organisms	• Students able to be good environmentalists. • Can able to identify toxicants around the environment.
	Developmental zoology	• Basic concepts of developmental processes of animals particularly man. • Understand the sequential changes from cellular grade of organization to organ grade of organization in the development of multicellular organisms.	• Students understand the basic concepts of formation of embryo and importance of hormones in the reproduction of humans.

II B. Sc. Zoology	Cell Biology and Genetics	• Structural and functional aspects of basic unit of life i.e. cell concepts • Mendelian and non mendielian inheritance • Concept behind genetic disorder, gene mutations- various causes associated with inborn errors of metabolism • inculcate the techniques of cell and molecular biology	• Students gain knowledge on cell and molecular concepts and heredity.
III B. Sc. Zoology	Home Aquarium and Vermitechnology	• understanding the construction and maintenance of aquarium, selection, culture and breeding technique. • Get the thorough knowedge of making vermicompost and vermiculture	• Understands the self employment practice and save the human being by the way of minimizing the use of chemical fertilizers. • gains knowledge about culture practices of aquarium fishes.
	Animal Physiology and Biochemistry:	• Interactions and interdependence of physiological and biochemical	• Students will gain skill to execute the roles of a biology teacher or medical lab technicians with

		processes Students are taught the detailed concepts of digestion respiration excretion the functioning of nerves and muscles • Carving an integrated approach to chemistry reoated to the functional significance of the various organs and organ systems of animals • Students gain fundamental knowledge of animal physiology	training as they have basic fundamentals
	Sericulture and Apiculture	• Gives knowledge of silk worm rearing, mulberry cultivation, pests and diseases associated with silk worm, mulberry and various process involved in silk production. • It is an agro based cottage industry in India that enables them to get self-employment • Sericulture is a comprehensive subject	• Students can examine the scope for self employment opportunities after their graduation account or the rural based and welfare oriented nature of Sericulture and Apiculture studies. .

		that gives in depth knowledge of the study of silkworms both physiological as well as commercial purposes including the various processes involved in the formation of silk. • Students gain knowledge about various systems study of silkworms and cocoons, other defective cocoons and Reeling and significant diseases seen in the silkworms • Students feel confident in teaching Sericulture as well as executing research projects • Knowledge of rearing of honey bees and extraction of honey.	
	Immunology and Microbiology	• Imparts in depth knowledge of tissues, cells and molecules involved in host defense mechanisms • Understanding of types of immunity • Interactions of antigens, antibodies, complements and other immune components • students can know the life cycle of	• Students will learn the immune mechanisms in disease control, vaccination, process of immune interactions.

		microbes and their control measures.	
	Animal biotechnology	• Imparts the Knowledge to culture animal cells in artificial media. • Knowledge of animal cells in culture, growth of cell lines • Use in recombinant DNA technology, genetic manipulations and in a variety of industrial processes. • It gives insight into various cell/tissues culture techniques • Understanding of in vitro culturing of organisms and production of transgenic animals. • Understanding of cloning of mammals, large scale culture and production from recombinant microorganisms	• Gains skills in medical, environmental biotechnology, biopesticides, Biotechnology of aquaculture and use of animals as bioreactors • This insight allows students to take into consideration about ethical issues involved in production transgenic animals and Bt products. • Students learn about the advancement in biological techniques and their utilization in biological fields. • know the concepts of isolation, cloning and insertion of various genes into prokaryotes.
	Aquaculture	• Understands concepts of fisheries, fishing tools and site selection • Aqua culture systems, induced	• Provides knowledge of ornamental fish breeding which is highly professional and attractive avenue for youth.

		breeding techniques, post harvesting techniques	
	Biostatistics, Computer Applications and Bioinformatics	• Students become familiar with Digital knowledge • Study the descriptive and non descriptive methods of mathematics and their applications in biology incorporating computer systems. • Familiar with various Applications of Bioinformatics • understand the mathematical principles of biological systems and bioinformatics	• Learners will apply the knowledge to collect various Biological data • Get awareness about nature of the emerging digital knowledge society

Department of Business Administration

Program	Course	Course outcomes	Specific outcomes
I BBA	Commercial Correspondence	• To make the learners to understand the significance of the business correspondence	• To improve learners' managerial skill and writing skill
	Environment of Business	• To acquaint the students with environment aspects in business atmosphere	• To enable the learners to acquaint with their communication skills
	Business Mathematics	• To make the students to understand mathematical aspects in business entity	• Learners would be exposed to various mathematical techniques employed in business.
	Business Statistics	• To equip the students with basic statistical knowledge and its applications	• To make the students about the importance of statistics in business realm.
	Office Management	• To enable the learners to understand the managerial concepts in time management	• To develop the scheduling skill among the learners
	Business Organisation	• To acquaint the students about the structural aspects of an organisation	• To equip the learners with managerial and administrative skills
	Principles of Management	• To make the students to understand the different aspects of management	• To equip the learners about the managerial administrative working principle
	Organisational Behaviour	• To enable the students to know the psychological theories of the employees	• This helps the learners to understand the nuances of behavioural theories.

II BBA	Business Law	• To make the students aware of legal aspects and requirement of Business laws	• To enable the learners understand working style of a company in accordance with law
	Secretarial Practices	• To understand the secretarial practices employed by organisations	• Learners would develop social skills through interaction
	Financial Services	• To make the students to develop accounting skills and knowledge.	• To enable the students to take up administration position in companies
	Cost Accounting	• To equip the students with knowledge of auditing and cost accounting.	• This helps the learners to know the elements involved in cost accounting structure
	Introduction to Banking	• To make the learners to know the banking procedures and banking structures	• This makes the students to understand institutional structure of banking
	Managerial Skill Development	• To enable the learners to know about risk management skills	• To develop social and managerial skills
III BBA	Entrepreneurship	• To make the students to understand risk factors employed in self govern organisation	• To make the students to take leadership responsibility
	Marketing Management	• To enable the learners to understand the marketing strategies of the companies.	• To mould the learners to take up challenges in real life situations
	Case Analysis	• To make the learners to evaluate critically about the companies	• To make the students to develop their critical thinking skills
	Research Methodology	• To enable the learners to know the different methods of research	• To enable the students to do research on their own
		• To understand the various aspects of retail	• To make the students to take up

	Retail Management	management.	leadership position in companies.
	Advertising	• To get to know the different aspects of advertising	• To equip the students with advertisement skills.

DEPARTMENT OF COMMERCE

Programs	Course	Course outcomes	Specific outcomes
I Bcom	Financial Accounting	• To make the learners to understand the different aspects of accounting	• To enable the students to understand the key concepts of accounting
II Bcom	Advanced Financial Accounting	• To make the students to know about the recording transactions in accounting domain	• To enable the students to understand structural pattern and transactions
	Business Statistics	• To enable the students to apply various statistical techniques for the quantification of data	• To make the learners to understand and apply statistical methods in business
	Banking	• To provide a fundamental exposure of banking knowledge to learners	• Learners would understand the structure and the procedure of banking
	HRM	• To enable the students to get to know about the managerial aspects in HRM	• Enabling the learners to understand the critical issues and challenges in HRM
	Company Organisation	• To provide a fundamental exposure to students about the concepts of company	• Learners would understand the administrative aspects of an organisation
	Business Communication	• To equip the students effectively to acquire soft skills	• Business communication helps the learners to expertise in writing and

			speaking skill
	Business Mathematics	• To provide the basic knowledge of mathematical techniques.	• Business Mathematics makes the learners to employ learnt techniques in real life environment
	Capital Market	• To create an interest among the students about the realm of stock market	• This broadens the understanding of capital market
	Import and Export	• To create an awareness about the import and export in a trade atmosphere	• This enable the students to get to know about the legal requirements and obstacles faced by trades at national and international standards
III Bcom	Corporate Accountintg	• To provide the regulatory framework for the operation of fundamental accounting	• Students would develop an understanding of operational structures of corporate accounting
	Cost Accounting	• To acquire the techniques of cost in business concerns	• To enable the learners about the technical aspects and working principle of the cost
	Business Law	• To study the scope and boundaries of business law	• To understand the legal framework and legal requirement for business

	Management Accounting	• To familiarise the students with the basic management accounting concepts and their applications	• To develop the applications of management concepts in managerial decision making
I Mcom	Management Accounting	• To familiarise the students about the management accounting practices	• To develop a broad spectrum understanding of management practices in administration
	Advanced Business Statistics	• To acquaint students with important statistical techniques for managerial decision making	• This helps the learners about the real time application of statistics in business computing
	Office Automation	• To the students to learn modern methods of office automation	• To enable the students to cop up with office automation tools
	Modern Marketing Management	• To impart the students about the modern techniques used by modern marketing management	• It helps the learners about the working techniques and methods of current marketing scenario
	Financial Management	• To make the students acquired with the modern principles of Financial management	• To enable the students to apply the financial practices in real life realm
	Advanced Cost Accounting	• To enable the students to know about advanced methods and practices used in cost accounting	• It helps the learners to understand and employ

II MCom			accounting practices in companies.
	Computerised Accounting Package 9.0	• To impart software knowledge about the computerised accounting practices	• Students would get knowledge on various computerised practices such as voucher entries, database creation and so on
	Indirect Taxation	• To make the learners to understand the indirect taxation system in India.	• To enable the learners to understand the hidden taxation system and how it works in business
	Financial Markets	• To know the different valuation techniques, methods and practices of financial markets.	• To apply the learnt valuation techniques in contemporary financial markets.