Program –Bachelor of Science (B.Sc.)

Program outcomes

Students taking admission to this program of B.Sc. or expected to get equipped with following outcomes

1. Inculcating scientific awareness and thinking among the students.
2. Explaining the basic scientific principles, objectives and methods.
3. Understanding the issues related to nature and environmental context and sustainable development and to handle the unexpected situation by critically analyzing the problem.
4. Ability to communicate with others in regional language and in English.

Course outcomes- B.Sc. Zoology

Program	**Program Objectives**	**Program Specific Objectives**
B.Sc. Zoology	Inspire the students for pursuing higher studies in Zoology and for becoming an entrepreneur and also enable students to get employed in the Biological research Institutes, Industries, Educational Institutes and in the various concerning departments of State and Central Government based on subject Zoology. To become aware of environmental crisis.	**PSO1**. To provide thorough knowledge about various animal sciences from primitive to highly evolved animal groups. **PSO2**. To make the students aware of applications of Zoology subject in various Industries. **PSO3**. To equip the students with skills related to laboratory as well as field based studies. **PSO4**. To make the students aware about conservation and sustainable use of Biodiversity. **PSO5**. To inculcate interest and foundation for further studies in Zoology. **PSO6**. To address the socio-economical challenges related to animal sciences. **PSO7**. To facilitate students for taking up and shaping a successful career in Zoology.
Sr. No.	**Course**	**Course Outcomes**
1	F.Y.B.Sc. Zoology	**CO1.** Exposure to diversity in animal groups and to understand the process of Evolution and industries based on the zoological areas are covered. **CO2.** The practical course is aimed to equip the students with skills

		required for animal identification, morphological, anatomical, technical description, classification and also applications of zoology in the various industries.
2	S.Y.B.Sc. Zoology	**CO1.** The level of the theory and practical courses are one step ahead of the first year B.Sc. courses based on content of first year syllabus. **CO2**. The course intends to inform the students in Animal Systematics, Animal Diversity and applied field of Zoology such as Fisheries, Apiculture, Sericulture, etc.
3	T.Y.B.Sc. Zoology	**CO1.** Detailed studies of the various disciplines of the zoology subject and other branches of zoology such as Genetics, Animal Physiology, Molecular biology, Biochemistry, Micro technique, Animal systematic and Diversity, General Embryology, Histology. Cell Biology, Biodiversity, Entomology, Biological Techniques, etc. **CO2**. The students will also learn about use of various technical skills in the biological sciences to be helpful during research in the zoology subject.

Course outcomes- B.Sc. Botany

Programs offered

Sr. No.	Program	Program Objectives	Program Specific Objectives
1	**BSc Botany**	**PO1.Critical Thinking**: The curriculum made for the betterment of the students, enhance the ability and thinking power. **PO2. Effective Communication: the complete medium of program is in English so students will communicate in the same.** **PO3.Social Interaction**: Due to continuous field visits in the interior regions students interact with the social activities for their study. **PO4.Effective Citizenship:** Being the botanist students have to communicate with many people, they become more familiar as well as interactive **PO5.Ethics**: The subject teach students about the ethical approach, not to cut the plants. **PO6.Environment and Sustainability**: conservation practices are studied for sustainable development **PO7.Self-directed and Life-long Learning**: each and every aspect of	**PSO1.**To provide thorough knowledge about various plant groups from primitive to highly evolve. **PSO2.**To make the students aware of applications of different plants in various industries. **PSO3.**To highlight the potential of these studies to become an entrepreneur To equip the students with skills related to laboratory as well as field based studies **PSO4.**To make the students aware about conservation and sustainable use of plants **PSO5.**To create foundation for further studies in Botany **PSO6.** To address the socio-economical challenges related to plant sciences **PSO7.** To facilitate students for taking up and shaping a successful career in Botany

		the module teaches lifelong learning	

Courses offered- Under graduate Botany

Sr. No.	Class	Course	Course Outcomes
1	**F. Y. B. Sc Botany (Annual Pattern)**	111: Plant Diversity, Plant Morphology and Anatomy	To provide thorough knowledge about various primitive plant groups.
		112: Industrial Botany	To make the students aware of applications of different plants in various industries To highlight the potential of these studies to become an entrepreneur
		Practical	To get acquainted with the subject in live form and visits to industries
3	**S. Y. B. Sc Botany Semester I**	211: Taxonomy of Angiosperms and Plant community	To provide thorough knowledge about various highly evolved plant groups and their community structure
		212: Plant Physiology	To study the different metabolic process for synthesis of food material
	S. Y. B. Sc Botany Semester II	221: Plant Anatomy and Embryology	Internal structure will be observed for further studies as well as to study the developmental pattern of plant
		222: Plant Biotechnology	To study the techniques of multiplication and Nano techniques

		Practical based on theory course	To equipped the students with skills related to laboratory as well as field based studies
4	**T. Y. B. Sc. Botany Semester III**	331: Cryptogamic Botany	Interpret the performance characteristics & life cycles of various lower plants
		332: Cell and Molecular Biology	To develop the mind from the cellular to molecular level.
		333: Genetics and Evolution	Analyze the evolution with genetically characteristics for future aspects
		334: Spermatophyta and Paleobotany	Evaluate the performance of various line of evolution with respect to live and fossil forms
		335: Horticulture and Floriculture	To develop the skills to become entrepreneurship for small scale startup
		336: Computational Botany	Apply optimization, numerical methods, statistical methods to solve problems
	T. Y. B. Sc. Botany Semester IV	341: Plant Physiology and Biochemistry	To study the different metabolic process for synthesis of food material in details
		342: Plant Ecology and Biodiversity	To make the students aware about conservation and sustainable use of plants
		343: Plant Pathology	Design different post harvest methods to cope over diseases.
		344: Medicinal and Economic Botany	To make the students aware about conservation and sustainable use of plants
		345: Plant Biotechnology	To study the techniques of multiplication and Nano techniques
		346: Plant Breeding and Seed Technology	Evaluate the performance of multiplication technique and seed storage technique

Course outcomes- B.Sc. Chemistry

	Program	Program objectives	Program specific objectives
1	B Sc. Chemistry	PO1. CRITICALTHINKING The curriculum is designed such way that students should acquire and ability to observe accurately and objectively. They should be able to solve the problems and also think scientifically, independently and draw rational conclusions. PO2. EFFECTIVE COMMUNICATION The medium of instruction for this course is English. English being the language of world students become habitual to communicate in English using language of 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. P04 EFFECTIVE CITIZENSHIP In this program students are made aware of pollution problems waste water management, water treatment etc. They are also made aware importance of energy and water, food, fuels, general hygiene and cleanliness etc. PO5 ETHICS In this program students are made alerts regarding misuse of food adulteration, chemical technology, poisons, fungicides, pesticides and chemical and nuclear	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. PSO 2 To provide thorough knowledge of laboratory skills so that students can prepare for the experimental setup, actual working of equipments, obtain experimental data and interpretation of it. This then interpreted using theoretical principles. PSO3 To make the students self sufficient in understanding and handling the various issues that may arise related to chemistry.

		weapons PO6 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 versed 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 Chemistry

Sr.No	Class	Course	Course Outcomes
1	F.Y.B.Sc. Chemistry (Annual Pattern)	Paper I Physical & Inorganic Chemistry	This course enables students to understand basic laws regarding states of matter, surface chemistry, thermodynamics and structure of atom. Students are also made aware of mole concept, derivations, depictions and problem solving and periodic properties of the elements including the preliminary theories of bonding.
		Paper II Organic & Inorganic Chemistry	Students are made aware of fundamental concepts of organic and inorganic chemistry which governs the structure, bonding, properties, structural effects, acid-base theories, preparation methods, reactivity and stereochemistry of organic molecules.
		Paper III Practical chemistry	Chemistry is an experimental subject; practical course is intended to achieve the basic skills required for understanding the concepts and authenticating the basic laws and principles of chemistry &helps in development of practical skills of the students.
2	S.Y.B.Sc. Chemistry (semester Pattern)	Physical & Analytical Chemistry CH211	Students are made aware about kinetics of chemical reactions, photochemical laws, and distribution law and extraction process. Students are introduced to analytical chemistry in which they are made aware of inorganic qualitative analysis and analysis of organic compounds (Qualitative & Quantitative). Along with it they also study error in quantitative analysis & ways to minimize them.
		Organic & Inorganic Chemistry	Students are made aware of stereochemistry of different stereoisomers & organic reaction mechanism in which they study different types of reagents, reactions and their mechanisms.

		CH212	Students are introduced to metallurgy to understand chemical reactions and processes occurred in metallurgy. The corrosion & passivity is also included in the syllabus.
	Semester II	Physical & Analytical Chemistry CH221	Students are made aware about 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 are made to understand volumetric analysis wherein they study non-instrumental volumetric analysis which comprises of study of various titrations, indicators used in it& some theoretical aspects related with titrations.
		Organic & Inorganic Chemistry CH222	Students are introduced to various biomolecules, their role & structural aspects. Students also study different oxidizing and reducing reagents, their selectivity to different substrates, heterocyclic, their preparation & reactions. Students are introduced to organometallic chemistry & use of organometallic compounds in synthesis of organic as well as inorganic compounds. They also study chemical toxicology to know adverse effects of chemicals.
	S. Y. B.Sc. Chemistry (Annual Pattern)	Practical course	Students are trained to determine the rate constant of chemical reactions, heat of solution, heat of neutralization, critical solution temperature of partially miscible system & distribution coefficient. Students are trained for quantitative analysis of different samples such as Na_2CO_3 in washing soda, Aspirin in APC tablet, Aluminum in Alum, strength of H_2O_2, Copper in Brass & iodimetric methods. Students are trained for organic & inorganic qualitative analysis. They are also trained for preparation of organic compounds & chromatographic techniques like TLC.
3	T. Y. B.Sc. Chemistry Semester III	CH-331 Physical Chemistry	Students are introduced basic concept of physical chemistry. They also learn methods to determine order of reaction, Arrhenius equation, and graphical evaluation of energy of activation. Students learn principle and applications of rotational, vibrational, Raman and electronic spectroscopy. Students will get familiar with phase rule, phase diagram of one and two component systems.
		CH-332 Inorganic Chemistry	Students are made aware of the principles of various theories of bonding like Sedgwick model, Werner's theory VBT, CFT, MOT. They are also made aware of the principles of isomerism, nomenclature and structures of inorganic complexes.
		CH 333 Organic chemistry	It is the basic course in organic chemistry. Students are introduced with concepts like acidity, basicity of organic molecules, electrophile, nucleophile and good and bad leaving groups. Students are introduced with stereochemistry of de substituted 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.
		CH 334 Analytical Chemistry	Students are made aware of quantitative chemical analysis using the techniques like gravimetry, polarography, AAS, FES and spectrophotometry at the levels of macro, micro and trace analysis of metals and non-metals from industrial and natural samples.
		CH-335 Industrial Chemistry	This course enables the students to learn use of agrochemicals like pesticide, insecticides, fungicides, fertilizers and their environmental impact. Study of food industry makes them aware of food adulteration, storage and processing of food. This course also provides opportunity to study agrochemicals, food chemicals on industrial scale. Students also learn manufacturing of basic chemicals such as Ammonia, Sulphuric acid and Nitric acid. Syllabus further comprises study of petrochemicals and eco- friendly fuels, where in students study processing of petrochemical fuels, properties of fuels and applications of fuels, on conventional energy. Syllabus also includes study of cement and glass industry. Properties, manufacture and applications of different types of cement and glass.
		CH-336 (C) Biochemistry	Students are introduced to the properties and character of fundamental components of living organism such as proteins, carbohydrates, lipids, vitamins and hormones. Students are expected to get familiarize with cell types, cell organelles and various techniques used in biochemical studies.
	T. Y. B.Sc. Chemistry Semester IV	CH-341 Physical Chemistry	The course aims to give fundamental understanding and applications of electrochemical Cells, Nuclear Chemistry, Crystal structure and Quantum Chemistry. Students get to know thermodynamics and EMF, Chemical cell with and without transfer, application of EMF measurement such as pH determination, determination of solubility and solubility product. Basic elements of quantum chemistry are also introduced.
		CH- 342 Inorganic Chemistry	Students are made aware of chemistry of f block elements principles and applications of catalysis, organometallic chemistry and the principles and the applications of metals, semiconductors and superconductors.
		CH -343 Organic chemistry	Students are introduced with carbanions and their reactions. Retrosynthetic analysis concepts are explained to students. Rearrangement reactions are introduced with mechanistic approach. Spectroscopic techniques like PMR, U.V. and I.R. are introduced. Students learned to differentiate organic compounds with the help of these spectroscopic techniques.
		CH 344 Analytical Chemistry	The students are trained in the technique of separation, identification of purification using chromatographic techniques like TLC, GC, HPLC, electrophoresis etc. This knowledge enables them to be good analytical of Quality control chemist in various fields.
		CH-345 Industrial Chemistry	Students are expected to learn properties, ways to manufacture or process and application of different types of polymer, paints, pigments, dyes, soaps, detergents and cosmetics. Students also learn theoretical aspects of manufacturing of sugar and fermentation industry. Syllabus further includes study of Pharmaceutical industry

			where students are introduced to general aspects of drug action, manufacturing of some drugs and its usage and lastly there is topic which discusses problems caused by industry such as pollution and generation of waste and what are the ways which can prevent or minimize it.
		CH-346 (C) Biochemistry	Students need to know the significant metabolic pathways necessary for the sustenance of life. Fundamental processes associated with central dogma of molecular biology are taught. Students get acquainted with applications of genetic engineering in various fields like agriculture, industries and medicine.
	T. Y. B.Sc. Practical Chemistry (Annual)	CH- 347 Physical Chemistry Practical	Students are trained in the techniques such as pH metry, Conductometry, Potentiometry, Colorimetry, Spectrophotometry, Refractometry and G. M. Counter. They learn to use these techniques in order to understand various chemical reactions.
		CH- 348 Inorganic Chemistry Practical	Students are trained in the IQA of different mixtures of inorganic compounds, and the separation of the metal ions using chromatographic techniques and inorganic quantitative analysis using the techniques of gravimetry, volumetry, colorimetry
		CH-349 Organic Chemistry Practical	Chemistry is an experimental subject; practical course is proposed 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.

Course outcomes- B.Sc. Mathematics

Sr. No.	Program	Program Objectives	Program Specific Objectives
1	**BSc Mathematics**	**PO1**: Promotion of self study **PO2**: Promotion of thinking **PO3**: Confidence **PO4**: Creativity **PO5**: Problem Solving **PO6**: Understanding Concepts	**PSO1**: To enable the students to cultivate a mathematical way of thinking i.e. making conjectures, verifying them with further observations, generalizing them, trying to find proofs and making observations. **PSO2**: To enable the students to quantify their experiences in other subjects they study. **PSO3**: To enable the students to learn the basic structures of mathematics through unifying concepts and to motivate these structures through applications. **PSO4**: To enable the students to study mathematics for themselves. **PSO5**: To provide high quality mathematical education at all levels that will be vital for scientific and technological developments. **PSO6**: To enable the students the concept of the subjects of complex analysis, Real Analysis, Group Theory,

		PO7: Development of Writing, Listening and Teaching Skills **PO8**: Group Discussion (Skill of Team work, interpersonal skills) **PO9**: Social Values: Unity in Diversity	Number Theory etc. **PSO7**: To enable the students for plotting the functions, curves and data in 2 and 3 dimensions. **PSO8:** To enable the students to communicate the other students for discussion on the subject knowledge. **PSO9:** To live social life, mathematical knowledge is needed, because of give and take process, business, industry, transportation and communication depends upon knowledge of mathematics.

Courses Offered

Course outcomes- B.Sc. Physics

Program Offered

Sr. No.	**Program**	**Program Objectives**	**Program Specific Outcomes**
1	B. Sc. Physics	To provide in depth knowledge of scientific and technological aspects of Physics · To familiarize with current and recent scientific and technological developments · To enrich knowledge through problem solving, hand on activities, study visits, Projects etc. · To train students in skills related to research, education, industry, and market. · To create foundation for research and	1. After completion of program, students will be able to have in-depth knowledge of basic concepts in Physics. 2. Students will be able to apply the laws of Physics in real life situations to solve the problems. 3. Students develop aptitude of doing research through undertaking small projects. 4. Student will have set his

		development in Electronics · To develop analytical abilities towards real world problems · To help students build-up a progressive and successful career in Physics	foundation to pursue higher education in Physics. 5. After completing the program student will have developed interdisciplinary approach and can pursue higher studies in subjects other than Physics

Courses Offered

Sr. No.	Course	Course Outcome
1	F. Y. B. Sc. 1. Mechanics	1. Demonstrate an understanding of Newton's laws and applying them in calculations of the motion of simple systems. 2. Use the free body diagrams to analyze the forces on the object. 3. Understand the concepts of energy, work, power, the concepts of conservation of energy and be able to perform calculations using them. 4. Understand the concepts of elasticity and be able to perform calculations using them. 5. Understand the concepts of surface tension and viscosity and be able to perform calculations using them. 6. Use of Bernoulli's theorem in real life problems. 7. Demonstrate quantitative problem solving skills in all the topics covered.
	2. Heat and Thermodynamics	1. Describe the properties of and relationships between the thermodynamic properties of a pure substance. 2. Describe the ideal gas equation and its limitations. 3. Describe the real gas equation. 4. Apply the laws of thermodynamics to formulate the relations necessary to analyze a thermodynamic process. 5. Analyze the heat engines and calculate thermal efficiency. 6. Analyze the refrigerators, heat pumps and calculate coefficient of performance. 7. Understand property 'entropy' and derive some thermo dynamical relations using entropy concept. 8. Understand the types of thermometers and their usage.

	3. Physics Principles and Applications	1. To demonstrate an understanding of electromagnetic waves and its spectrum. 2. Understand the types and sources of electromagnetic waves and applications. 3. To understand the general structure of atom, spectrum of hydrogen atom. 4. To understand the atomic excitation and LASER principles. 5. To understand the bonding mechanism in molecules and rotational and vibrational energy levels of diatomic molecules. 6. To demonstrate quantitative problem solving skills in all the topics covered.
	4. Electromagnetic	1. Demonstrate an understanding of the electric force, field and potential, and related concepts, for stationary charges. 2. Calculate electrostatic field and potential of simple charge distributions using Coulomb's law and Gauss's law. 3. Demonstrate an understanding of the dielectric and effect on dielectric due to electric field. 4. Demonstrate an understanding of the magnetic field for steady currents using Biot-Savart and Ampere's laws. 5. Demonstrate an understanding of magnetization of materials. 6. Demonstrate quantitative problem solving skills in all the topics covered.
	5. Practical	1. Acquire technical and manipulative skills in using laboratory equipment, tools, and materials. 2. Demonstrate an ability to collect data through observation and/or experimentation and interpreting data. 3. Demonstrate an understanding of laboratory procedures including safety, and scientific methods. 4. Demonstrate a deeper understanding of abstract concepts and theories gained by experiencing and visualizing them as authentic phenomena. 5. Acquire the complementary skills of collaborative learning and teamwork in laboratory settings.
2.	S. Y. B. Sc.	
	Mathematical Methods in Physics I	After learning this course students will be capable to knows the 1. Complex algebra :- the basic idea of complex

		algebra is useful in physics and applied based physics course, e.g. Computer programming, 2. vector algebra:- it's plays an important role in Geometry, Mathematics and Engineering physics 3. Students understand the concept of partial differentiation equation. Such type of equation is applicable for solving various difficult problems in engineering and applied physics 4:- After completing this chapter students understands singular and nonsingular points of differential equation. Students will have developed interdisciplinary approach and can pursue higher studies in subjects, like Mathematics and Computer Science and other branches.
	Electronics I	After learning this course students will be capable to knows the 1. Understand the application of various theorem to different circuits. 2. Understand the properties and working of transistor, and operational amplifier etc.. 3. Understand the functions of operational amplifiers. 4. Design circuits using transistors and operational amplifiers. 5. Understand the Boolean algebra and logic circuits. 6. Skill of solving problems.
	Oscillations, Waves and Sound	After learning this course students will be capable to knows the 1 Solve the equations of motion for simple harmonic, damped motion and forced oscillations. 2 Understanding of Lissajous figures and to demonstate Lissajous figures experimently and its applications. 3 Describe oscillatory motion with graphs and equations, and using these descriptions to solve problems of oscillatory motion. 4 To solve LCR series circuits and its concepts in damped oscillation. Explain oscillation in terms of energy exchange, giving various examples. 5 Solve problems relating to undamped, damped and force oscillators. 6. To understand the term resonance and applications of resonance. 7 .Concept of wave motion and to know the different types of waves

		8 Calculate the phase velocity of a travelling wave. To understand the term seismology and its study. 8 Explain the Doppler effect in sound /light and predict in qualitative terms the frequency. 9The frequency change that will occur for a stationary and a moving observer. 10 Application of Doppler effects. 11. Define the decibel scale qualitatively, and give examples of sounds at various levels. 12. The pitch, intensity, and quality of tones produced by musical instruments 13 To understand reverberation, reverberation time, stroboscope. 14. The problem solving skill in all topics.
	PH-222 Optics	1.:- acquire the basic concepts from geometrical optics like sign convention, lens maker's formula by using this concepts students will become good opticians in society , 2:- After learning this Lens Abberation, students will able to remove the different types of abberations and it is for lens maker's formula 3:-students get more idea about spectrum of different seven colours in nature due to interference of light also, due to constructively and destructively interfere of light students well undersand about the relation between intensity and amplitude of wave light , light beam spreads out after passing through an aperture 4:-the role of polarization is in electromagnetic waves,O-rays and E-rays which is appreciate in various modern optical devices that utilize electromagnetic wave , Interference and diffraction are the polarization phenomena , analyze gets the interference and diffraction phenomena.
	PH -232Practicals (S.Y.B.Sc.)	Practical course will help to student to improve the knowledge from theory course Whatever the students learned in their theory courses such as, Newtons Rings, different Circuit thermo, Logic gates ,characterization based electronic experiment waves oscillations and sound and optics. They need to verify basic concept.
3	T. Y. B.Sc.	
	Mathematical Methods in Physics II	1. There are following four Chapter Special functions in this course: 2. Curvilinear Co-ordinates

		3. The Special Theory of Relativity 4. Differential equations 5. Special functions 6. By studying this course the basic and advanced mathematical background required for other courses. After completing this course student get knowledge of basic Curvilinear Co-ordinates system, Special Theory of Relativity, differential equations and Special functions 7. Skill of solving problems
	Classical Electrodynamics	After completion of course students well known 1. Be able to understand basic laws of electrostatics Gauss laws and by using use method of images in electrostatics to solve the boundary value problems. 2. To explain the basic laws in magneto statics like Biot-Savart's law, Ampere's law etc. 3. Have understood Maxwell's laws of electrodynamics. Be able to solve Maxwell's equations in free space and write equation of plane e-m waves 4 Skill of solving problems
	Solid State Physics PH-332:	After completion of course students should 1. Understanding of various types of crystal structures and should have understood the concept of reciprocal lattice. 2. Student should have idea of various characterization techniques like x-ray diffraction, UV-visible spectroscopy, SEM, TEM, TGA etc. 3. Have understood the free electron model, band formation and origin of band gap. 4. Be able to understand the theory of magnetism and phenomena like superconductivity. 5. To understand the concept of band formation and by using band theory of solids to compare conductor, semiconductor, and insulator. 6. Skill of solving problems

	Quantum Mechanics	T.Y.B.Sc., Quantum Mechanics course is a foundation course. In this course, student will learn idea of wave function and application of schrodingers equations. Understand and explain the differences between classical and quantum mechanics, understand Schroedinger equation for simple potentials. Also, students will gain a basic understanding of the formalism and 'language' of quantum mechanics especially commutation brackets, various quantum mechanical operators.syudent gets skill of solving problems.
	Classical Mechanics PH-343:	After completion of course students should understand 1. All the classical concepts are useful and applicable to day today life. 2. Concept of central force and Keplers law, Poissons Bracket,Jocobi identity 3. Lagragian, Hamaltonian eqution and their application. 4. Skill of solving problems.
	PH- 343 Thermodynamics and Statistical Physics	After completion of this course, students get under the stand basic assumptions of kinetic theory of gases, coefficient of viscosity, coefficient thermal conductivity, diffusion of solid, transport phenomenon. Thermo dynamical physics students will get more clear about different law of thermodynamics and it's relation from this students will able to find different Maxwell's equations, Elementary concepts of Statistics such as probability, distribution functions, Gaussian Probability distribution etc. , Statistical distribution of system of particles, Different statistical ensembles: micro canonical, canonical and calculation of mean values in canonical ensembles, Maxwell-Boltzmann's, Bose Einstein , Fermi Dirac Statistics, .
	PH-334 Atomic and Molecular Physics	On successful completion of this course students will be able to understand about 1. 1:- The study of atomic structure has played important role in the fundamental development of physics and in the development of our understanding of the structures of the atom and matter atomic

		structures starts from Rutherford's atomic model up to Vector atomic model. The concepts of space quantization, Spectra of sodium atom Pauli Exclusion Principle, Spectral notation for quantum states Concept of atomic absorption and emission spectra, spectra associated with hydrogen atom LS and JJ coupling schemes associated with one and two valence electron system. The splitting of atomic energy levels and associated spectral lines when atoms are placed in external magnetic and electric field: Zeeman Effect, Stark Effect. The idea about x-ray spectroscopy, molecular spectroscopy. Details about the Raman Effect and Applications.
	PH-344 Nuclear Physics	On successful completion of this course students will be able to understand about The concepts Basic properties of nucleus and its application, it may be used for both constructive as well as destructive purposes.
	PH-335, Computational Physics	The main objectives of course are to introduce the basic course in computer and basic language of c programming for T. Y. B.Sc. students In this course, student will understand basic concepts of algorithms and flowcharts, programming in C language, errors in computations and various numerical analysis methods such as, obtaining roots of a function, finding integration. Also, students will get practice of programming through small programs like sorting array, graphics, finding factorial, using functions and pointers etc.
	Electronics/Advanced Electronics	The main advantages of this course is 1. Understand the basic knowledge of basic components like LED , Photodiode , Transitor

		, OP-amp, IC741, IC555, etc 2. Able to design various circuits which can be used professionally. Ie. Power supply, Electronically regulator using IC723 3. Able to understand AC, DC current/voltages concept for safety measurements. 4. Able to understand the concepts of Half Adder, Ful Adder, substractor, K-map, counters etc 5. To skill of solving problem
	Elements of Materials Science	On successful completion of the course students know the following basic concepts 1To know the general information regarding the properties of materials. 2. To solve concepts in Materials Science to solve engineering problems. 3. It is easy to select materials for design and construction for various purposes. 4. Able to identify smart materials and use of them in day today life. 5. skill of the solving problem
	PH-394- Physics Project	Project course will help to student to improve the knowledge from theory and practical course

	PH-374 ,Practical course- I	The main objectives of course are to increase the understanding depth of theoretical concept like physical properties of matter, quantum mechanics, nuclear physics, statistical mechanics, electrodynamics etc. On successful completion of this practical course students will able to understand 1. Have developed skills to plan experiments for studying the properties of matter like viscosity, Young's modulus and Thermal conductivity 2. Be able to plan and perform electronic experiments like Anderson's bridge, determination of energy gap of semiconductor etc. 3. Be able gain necessary skills to perform experiments like verification of Stephan's Law, Determination of Plank's constant and Redberg's constant. 4. Be able to plan and execute experiments for determination of M. I. of a bar by bifilar suspension method and electromagnetic pendulum. 5. Be able to analyses data from experiments of x-ray diffraction.

	PH-384 Practical Course –II	On successfully completing the course students should 1. Be able to write and execute simple programs in C language. 2. Be able to perform computer interfaced Physics experiments. 3. Be able to determine particle size by using Scherer formula from XRD. 4. Be able to plan and perform experiment to determine the thickness of cylindrical obstacle by using diffraction of laser light 5. Have acquired necessary skills to design a stable multivibrator circuit using IC-555. 6. Be able to plan an experiment to study the characteristics of FET. 7. Should be able to analyseuv-visible spectroscopic data of semiconductor thin films.