

RAJAPALYAM RAJUS' COLLEGE

DEPARTMENT OF PHYSICS

S. No.	Subject Name / Subject code	Curriculum Outcome
I-B.Sc PHYSICS		
1	Mechanics and Properties of Matter / SPHJC11	<p>The most crucial subject Mechanics in Physics is TO</p> <ul style="list-style-type: none"> ➤ Understand the basic concepts of mechanics and apply it to various physical problems. ➤ Analyse the different properties of matter ➤ Acquire fundamental knowledge in Newtonian mechanics of linear motion ➤ Understand the basic concepts of rotational motion of Bodies ➤ Gain the knowledge of gravitational force between bodies including planets ➤ Analyze the elastic and viscous properties of materials ➤ Understand the concepts of surface tension and its Implications.
2	Programming in C / SPHJS11	<p>The most important benefit of the C programming language, is that it is recognised worldwide and used in multitude of applications</p> <ul style="list-style-type: none"> ➤ Understand and use different programming statements. ➤ Understand and use different loop control structures in Programming ➤ Understand and apply different functions in Programming ➤ Apply the knowledge of program techniques to develop C-Programs for solving simple problems in Physics.
3	Solar Energy / SPHJS12	<p>Solar power is a very important energy source in the move to clean energy production.</p> <ul style="list-style-type: none"> ➤ Understand the basics of fossil fuels, renewable energy, their sources and applications. ➤ Understand the importance and different methods of harvesting solar energy, and their applications. ➤ Understand the fundamentals of wind energy, their applications, and methods of tapping wind energy.

		<ul style="list-style-type: none"> ➤ Understand the importance of ocean energy, methods of tapping them and use in daily life. ➤ Apply the modern energy harvesting techniques in daily life.
4	Thermal Physics and Acoustics / SPHJC21	<p>While branch of Physics, thermodynamics, deals with how heat is Sure, thermal energy is usually the most important component of internal energy</p> <ul style="list-style-type: none"> ➤ Acquire knowledge on the fundamental laws of thermodynamics ➤ Understand the basic principles of thermodynamic potential ➤ Describe the basic knowledge on kinetic theory of gases ➤ Understand the concepts on the black body radiation ➤ Analyse the basic concepts on energy distribution.
5	Astrophysics / SPHJS21	<ul style="list-style-type: none"> ➤ Astrophysicists seek to understand the universe and our place in it. Astrophysics is the physics of stars and other distant bodies in the universe to ➤ Understand the different planets, their composition and their surroundings. ➤ Understand the formation of objects like comets, meteors, etc. ➤ Understand the properties of Sun, activities in Sun and their planets. ➤ Understand the formation of stars and their life. ➤ Understand the origin of the universe and different properties.
6	Medical Physics / SPHJS22	<p>Medical Physics is a branch of Applied Physics, pursued by medical physicists</p> <ul style="list-style-type: none"> ➤ Understand and operate cardio graphic instruments. ➤ Understand the principles of artificial organs, and their applications. ➤ Understand the principles and working of biomedical instruments, and use them appropriately. ➤ Understand the effects of exposure to radiation, and apply this for the use safety instruments. ➤ Operate hazard monitoring instruments, analyse them and take necessary safety measures.
II-B.Sc PHYSICS		
1	Electricity	Electromagnetism has important scientific and

	and Electromagne tism / SPHJC31	<p>technological applications:</p> <ul style="list-style-type: none"> ➤ Describe the properties of static charges. ➤ Understand the basic concepts of thermoelectricity and their related experiments. ➤ Design LCR circuits and AC bridges. ➤ Understand the fundamentals of magnetism. ➤ Apply the knowledge on electromagnetism in solving real world problems.
2	Optics and Spectroscopy / SPHJC41	<p>Optical spectroscopy has been used for centuries for determining the chemical composition of materials and making decisions by sensing properties and converting them into an optical signature</p> <ul style="list-style-type: none"> ➤ Understand the basic concepts of waves and their types. ➤ Acquire the basic concepts on acoustics and analyze the acoustical demand of building ➤ Describe the optical interference mechanism. ➤ Acquire the knowledge on creating the optical diffraction Phenomena ➤ Apply the basic concepts of polarization phenomena
III-B.Sc PHYSICS		
1	Atomic Physics and Quantum Mechanics / SPH8C51	<p>The structure and properties of atoms are the basis of Chemistry, and hence of Biology, Atomic Physics underlies the study of Astrophysics and Solid State Physics.</p> <ul style="list-style-type: none"> ➤ Study the behaviour of atoms under the influence of electric and magnetic fields. ➤ Understand and analyse the time dependent Schrodinger wave equation. ➤ Learn the basic concepts on bound states in an arbitrary potential ➤ Understand the fundamental concepts on theory of relativity. ➤ Understand the basic concepts on vector atom model. ➤ Learn the concepts on fine structure of atomic spectral lines.
2	Nuclear Physics / SPH8C52	<p>Nuclear Physics is an important pursuit because the study of the nucleus of the atom is at the heart of our ability to understand the universe.</p> <ul style="list-style-type: none"> ➤ Acquire the knowledge on nucleus and nuclear models.

		<ul style="list-style-type: none"> ➤ Understand different types of nuclear reactions and nuclear reactors. ➤ Understand the designing of particle accelerators and detectors.
3	Analog Electronics / SPH8C53	<p>Analog circuits and digital circuits, circuits working and the difference between Analog circuit and Digital circuit</p> <ul style="list-style-type: none"> ➤ Understand the basic concepts of semiconductor diodes. ➤ Understand the basics of characteristics transistors. ➤ Analyse the characteristics of transistor amplifiers. ➤ Design the different types of oscillators using transistors. ➤ Understand the basic concepts of Field Effect Transistor and OPAMP
4	Bio-Medical Instrumentation / SPH8S51	<p>Biomedical Instrumentation helps physicians to diagnose the problem and provide treatment. To measure biological signals and to design a medical instrument, concepts of electronics and measurement techniques are needed.</p> <ul style="list-style-type: none"> ➤ Understand and operate cardio graphic instruments. ➤ Understand the principles of artificial organs, and their applications. ➤ Understand the principles and working of biomedical instruments, and use them appropriately. ➤ Understand the effects of exposure to radiation, and apply this for the use safety instruments. ➤ Operate hazard monitoring instruments, analyse them and take necessary safety measures.
5	Classical and Statistical Mechanics / SPH8C61	<p>Classical mechanics has many important applications in other areas of science</p> <ul style="list-style-type: none"> ➤ Apply the Lagrangian and Hamiltonian's formalism for solving the macroscopic physical problems ➤ Understand the basic concepts of canonical transformations and Poisson's brackets ➤ Understand the basic concepts in small oscillation ➤ Gain the basic knowledge on classical statistics ➤ Understand the basic concepts of quantum statistics
6	Material Science / SPH8C62	<p>Materials scientists do everything from fundamental research on the chemical properties of materials to developing new materials and modifying formulations of existing materials</p>

		<ul style="list-style-type: none"> ➤ Understand the structural behaviours of materials. ➤ Understand the fundamental concepts of elementary lattice dynamics ➤ Learn the concepts of semiconducting and magnetic properties of solids ➤ Understand and analyse the dielectric properties of materials. ➤ Get the basic theoretical knowledge on superconducting materials ➤ Understand the internal atomic arrangement of atoms in crystals ➤ Acquire the knowledge on the properties and applications of Nonmaterial ➤ Learn the basic characteristics and applications of advanced materials ➤ Analyse the different mechanical behaviour of materials ➤ Understand the different techniques to characterize the materials.
7	Digital Electronics / SPH8C63	<ul style="list-style-type: none"> ➤ Digital electronic circuits are main thing in digital electronics which is usually made from large assemblies of logic gates. ➤ Understand the binary number systems. ➤ Apply the basic binary arithmetic and solve the problems ➤ Design the registers and counters using digital logic circuits ➤ Design the circuits on amplitude, frequency modulation and their demodulation. ➤ Understand the basic principles and types of optical fibers and design the optical receiver circuit.
8	Opto Electronics / SPH9S61	<p>Optoelectronics concerns the study and application of electronic devices</p> <ul style="list-style-type: none"> ➤ Understand concepts of Photodiodes ➤ Apply the Optical fibers telecommunications, sensors, fiber lasers, bio-medicals and in many other industries.

PROGRAM EDUCATIONAL OBJECTIVE:

Programme outcome in B.Sc PHYSICS :

- Apply theories, principles and concepts of physics into practice
- Be familiarized with the emerging areas of Physics and its applications
- Develop scientific temper which would benefit the society at large through scientific innovations and inventions
- Acquire jobs in diverse fields such as science, engineering, education, etc.,
- Work as teams, to start new ventures and also to pursue research and higher education
- Understand the issues of environmental contexts and sustainable development
- Acquire the ability to engage in independent and life-long learning in the broadest context socio- technological changes.

PROGRAMME OUTCOME:

POs describe what students are expected to know or be able to do by the time of graduation from the programme;

At the end of the programme, the students will

- ❖ Be able to identify, formulate and solve the complex problems in the fields of theoretical & experimental Physics, condensed matter physics and electronics
- ❖ Recognize the need for and have an ability to engage in life-long learning and be able to demonstrate a knowledge of contemporary issues
- ❖ Be able to design a system, component, or process to meet desired needs with in realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- ❖ Be able to communicate effectively in oral and written form

- ❖ Be able to plan,. Execute and report the results of a complex extended experiment or investigation, using appropriate methods to analyze data and to evaluate the level of its uncertainty.