Physics Education: Scope and Career

Sarveshwar Kasarla

Assistant Professor of Physics, Institute of Science, Nagpur.

Abstract:

Students offer Physics as one of the majar subject in Science discipline to plan and develop theircareer.In India the university curriculum offers three majar subjects at graduation level.Few Universities offer Honourary programs for few subjects.This article mainly deals with the Scope of the Physics subject and Career opportunites after graduation.

Introduction:

India is a well populated country and is making a significant mark in the areas of Science education and continual professional development. In Science streamUniversities offer Bachelor of Science Programme involves theory and laboratory courses.The eligibitycriterion for entry to this program is 10+2(Intermediate)and three years duration. The student may opt any of the combination of three subjects as per his/her interest from the subjects and availability sanctioned subject group at the Institute or study center. The most popular subject combination is Physics, Chemistry, Mathematicsand Chemistry, Botany Zoology.The other subjects may be listed as, Biochemistry,Biotechnology, Computer Science, Electronics, Environmental Science,Geology,Geography,Microbiology,etc.Open Universities offer more choices in selecting the these combinations.During B.Sc.(General) program all the three subjects have equal weightage of Lectures(Theory) and Practicals(Laboratory Course) at all the three years except Mathematics where only Lectures and tutorials contribute towards teaching and learning only.English and a regional languge is mandatory at first year of the course.Few Universities offer B.Sc.(Honours) where one of three subject is continued as a major and other two will be droped by choice.The students are counseled by the teachers during entry to this program.

Physics is one of the most demanding subjects offered by majority of science students, the scope and career opportunities are listed in this article.The main objective of the B.Sc.(Physics) is to give learner a strong background knowledge and to develop professional skills to enhance the employability The curriculum of Physics in all universities may differ slightly.The aim is to cover the general course content, skills acquired after learning Physics and employment opporunities available in the society.

Physics:

Thebranch of Science which deals with study of matter, energy, and the interaction between them.Physics is the oldest and most basic pure science.Since matter and energy are the basic constituents of the nature, its discoveries find applications throughout the natural sciences. Physics may be divided broadly into classical physics and modern physics.

Classical Physics:

Classical physics (developed before the beginning of the 20th century).The traditional brancheslike mechanics, sound, light, heat, and electricity and magnetism are well known. Mechanics deals with bodies acted on by forces and bodies in motion and may be divided into statics (study of the forces on a body or bodies at rest), kinematics (study of motion without its causes), and dynamics (study of motion and the forces that affect it); mechanics may also be divided into solid mechanics and fluid mechanics (further include hydrostatics, hydrodynamics, aerodynamics, and pneumatics). Acoustics, the study of sound, is also a branch of mechanics because sound is due to the motions of the particles of air or other medium through which sound waves can travel. Ultrasonics, the study of sound waves of very high frequency, beyond the range of human hearing. Optics, the study of telescopes,colours of thin films ,light(not only with visible light but also concerned with infrared and ultraviolet radiation), (includethe phenamana of reflection, refraction, interference, diffraction, dispersion and polarization of light). Heat and thermodynamics deals with the pressure - volume changes that take place in a gas when its temperature changes, working of refrigerator, etc. Electricity and magnetism (include Electrostatics deals with electric charges at rest, electrodynamics with moving charges, and magnetostatics with magnetic poles at rest.

Modern Physics:

Modern physics is mostly concerned with the interaction of matter and energy under extreme conditions It include atomic and nuclear physics (studies matter on the smallest scale at which chemical elements can be identified). The high-energy physics (or physics of elementary particles)is on an even smaller scale, being concerned with the most basic units of matter; this branch of physics is also known as because of the extremely high energies necessary to produce many types of particles in large particle accelerators.

The two chief theories of modern physics present a different picture of the concepts of space, time, and matter from that presented by classical physics. The quantum theory is concerned with the discrete, rather than continuous, nature of many phenomena at the atomic and subatomic level, and with the complementary aspects of particles and waves in the description of such phenomena. The theory of relativity is study of description of phenomena that take place in a frame of reference that is in motion with respect to an observer.The special theory of relativity deals with relative uniform motion in a straight line and the general theory of relativity with accelerated motion and its connection with gravitation. As development continued, Modernphysics further gave rise to Astrophysics, Solid state physics,Nuclear Physics,Plasma Physics etc.

Learning Physics involve the process of deep understanding the physical phenomena and their applications.The cause-effect relationships in our life very well understood by learning Physics. This makes a complex problem to appear simple.Physics is exciting in many ways and the thrill lies in carrying out new experiments to disclose the secrets of nature. Transforming physical laws and theories into some useful applications require great effort.

The American Physical Society (APS) describes the skillset that physics majors cultivate: "Given that physics is one of the broadest scientific disciplines, in the course of receiving a physics degree most students develop expertise with a great variety of scientific instruments and techniques. These kinds of 'hard skills' are what make physicists so attractive to employers in physics, engineering and computer science fields."Some of the particulars they mention:Physics learner develop Research and problem solving, Fluency in using scientific equipment, Refined mathematical and numerical skills, Programming,Modeling and simulation,Quality control protocol.Also he develops soft skills such as developing strategic written and oral communication skills, Learning to work as a team, being a good listener.

Employment:

Once your degree completed, you may seek information about the available vacancyand apply for the job.Seek all the information about the organization you want to enter.This could help you to make your interview better.The various jobs fit well for Physics graduate are ;Process engineer, Applications engineer,Fieldengineer,Optical Analyst,

Research analyst,Research assistant, Quality Controllofficer,Fire engineer, Lab technician, Web developer, Programmer, Physics teacher,

Physics and Society:

The invention of electricity,steam engine, nuclear power,had a great impact on human civilization. Physics and Technology has transformed the life style of entire mankind.The contribution of physics in the development of alternative resources of energy is significant. We are consuming the fossil fuels at such a very fast rate that there is an urgent need to discover new sources of energy which are cheap. Production of electricity from solar energy and geothermal energy is a reality now, but we are still yet to achieve the goals . Another example of physics giving rise to technology is the IC Technology (IC) . The development of newer ICs and faster processors made the IT industry to grow leaps and bounds in the last two decades. Computers have become affordable now due to improved production techniques and low production costs.

Conclusion:

The ultimate purpose of technology is to serve entire society. Awareness about science and technology is growing in our society. Things are going to be more beautiful if we develop an understanding of the laws of physics.

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