

## **1. National Academic Reference Standards for Physics**

Physics is the study of energy and behavior of single atom and its components. Physics is the foundation upon which the other physical sciences are based such as; astronomy, chemistry and geology. The beauty of physics lies in the simplicity of the fundamental physical theories and assumptions that can alter and expand our view of the world around us. Like all sciences, physics is based on experimental observations and quantitative measurements. The main objective of physics is to use a limited number of fundamental laws that govern natural phenomena to develop theories that can predict the results of future experiment.

Physicists are expected to become investigators in industrial or research institutions. They can also have careers as air navigators and instrument manufacturers, scientific reporters, technical consultants and university staff members. They can also be employed in information technology companies, educational institutions and health care organizations.

### **1.1. The Attributes of a Physicist**

**In addition to the general attributes of basic sciences graduates, the physics graduates must be able to:**

- 1.1.1. Demonstrate a good basic knowledge of structural and functional aspects of physical systems at many spatial scales, from single molecule to the whole system.
- 1.1.2. Connect fundamental ideas about the physical behavior of matter and energy to system's structure and function.

### **1.2. Knowledge and Understanding**

**In addition to the general knowledge acquired by Basic Sciences graduates, the physics graduates must know and understand the:**

- 1.2.1. Characteristics and physical properties of matter.
- 1.2.2. Static and dynamic properties of fluids.
- 1.2.3. The Basics of Electricity.
- 1.2.4. Concepts of electromagnetism.
- 1.2.5. Principles of heat transfer and thermodynamics.
- 1.2.6. Theoretical and practical aspects of optics, nuclear physics and other related branches.
- 1.2.7. Application of advanced physical techniques.
- 1.2.8. Basics and mechanisms of energy transfer.

### **1.3. Practical and Professional skills**

**In addition to the general skills acquired by Basic Sciences graduates, the physicist must be able to:**

- 1.3.1. Apply mathematical tools and techniques to analyze and interpret experimental results.
- 1.3.2. Implant comprehensive physical knowledge and understanding as well as intellectual skills in research tasks.
- 1.3.3. Use the national standards for laboratory equipment which are essential for practical research work.
- 1.3.4. Present theoretical and experimental results in understandable forms such as tables and graphs.

### **1.4. Intellectual skills**

**In addition to the general skills acquired by Basic Sciences graduates, the physicist must be able to:**

- 1.4.1. Utilize theories of physics to interpret physical phenomena.
- 1.4.2. Apply appropriate physical principles to create and analyze system components.
- 1.4.3. Choose optimum solutions for physical problems based on analytical thinking.