Ph. D. Experimental physics

Preface

Physics is the natural science that involves the study of matter and its motion through space and time, along with related concepts such as energy and force. One of the most fundamental scientific disciplines, the main goal of physics is to understand how the universe behaves.

Experimental or applied physics is physics which is intended for a particular technological or practical use. It is usually considered as a bridge or a connection between physics and engineering.

"Applied" is distinguished from "pure" by a subtle combination of factors such as the motivation and attitude of researchers and the nature of the relationship to the technology or science that may be affected by the work. It usually differs from engineering in that an applied physicist may not be designing something in particular, but rather is using physics or conducting physics research with the aim of developing new technologies or solving an engineering problem. This approach is similar to that of applied mathematics. In other words, applied physics is rooted in the fundamental truths and basic concepts of the physical sciences but is concerned with the utilization of these scientific principles in practical devices and systems.

Applied physicists can also be interested in the use of physics for scientific research. For instance, the field of accelerator physics can contribute to research in theoretical physics by enabling design and construction of high-energy colliders.

The Ph.D. in Experimental Physics aims to provide a graduate able to master the basics and methodology of scientific Experimental Physics Research, the continuity to add new knowledge to Experimental Physics, apply analytical and critical methodology in Experimental Physics and related fields, integrate specialized and related knowledge in developing and inferring the interdisciplinary relationships, show deep awareness of the ongoing problems and modern theories in Experimental Physics, determine the professional Experimental Physics problems and find innovative solutions for them, master a wide array of professional skills in Experimental Physics, develop new methods, tools and techniques for professional Experimental Physics practices, use suitable technological tools to enhance Experimental Physics profession, communicate effectively and lead a working team in different professional contexts, make discussions in light of available Experimental Physics information, employ and develop the available resources efficiently and search for new ones, show awareness of community development and environmental conservation, behave in a manner reflecting commitment to integrity and credibility, and continue self-development and transfer professional Experimental Physics experiences to others.

Program Aims

Experimental Physics Ph.D program aims are:

1- To provide students with a broad education in fundamental aspects of Experimental Physics and higher level of knowledge and understanding of subjects.

2- To develop in students the ability to apply their physical knowledge and skills to the solution of theoretical and practical problems in Experimental Physics and related disciplines.

3- To prepare a graduate able to guide the development in Experimental Physics in an industrial, economic, environmental and social context.

3- To provide students with experience in thinking, computing, problem management and information technology

Program Courses

Selective Courses (4 courses)

Code No.	Course Title	No. of Units	No. of hours/Week		
			Lect.	Lab.	Exer.
Phys721 **ف721**	**الخواص الفيزيائية للجوامد** **Physics Properties of Solids**	2	2	-	-
Phys722 **ف722**	**انتقال الطورى** **Phase Transformation**	2	2	-	-
Phys723 **ف723**	**طرق التحليل الطيفي** **Spectroscopic Methods of Analysis**	2	2	-	-
Phys724 **ف724**	**أجهزة أشباه الموصلات الإلكترونية البصرية** **Semiconductor Optoelectronic Devices**	2	2	-	-
Phys725 **ف725**	**فيزياء السطوح** **Surface Physics**	2	2	-	-
Phys726 **ف726**	**طرق متقدمة في فحوصات البنية التركيبية** **Advanced Methods of Structural Investigations**	2	2	-	-
Phys727 **ف727**	**موضوعات مختارة في فيزياء المواد المكثفة (الجوامد)** **Selected Topics in Condensed Matter Physics**	2	2	-	-
Phys728 **ف728**	**مقدمة في تصادم الأيونات الثقيلة عند الطاقات العالية** **Introduction to High Energy Heavy-Ion Collision**	2	2	-	-
Phys729 **ف729**	**تفاعلات نووية مباشرة** **Direct Nuclear Reaction**	2	2	-	-
Phys730 **ف730**	**نظرية التركيب النووي** **Nuclear Structure Theory**	2	2	-	-
Phys731 **ف731**	**معجلات و مصادمات** **Accelerators and Colliders**	2	2	-	-

Phys732 **ف732**	**قياسات ضوئية** **Optical Measurements**	2	2	-	-
Phys733 **ف733**	**قياسات لونية** **Color Measurements**	2	2	-	-
Phys734 **ف734**	**معالجة وتحليل الصور** **Image Processing**	8	8	-	-

4- The thesis

Code No.	Course Title	No. of Units	No. of hours/Week		
			Lect.	Lab.	Exer.
	The thesis	52	0	52	0

7- متطلبات الالتحاق بالبرنامج :

M.Sc. degree in Physics from any Egyptian University or equivalent degree from Arabic or foreigner University.