

Bachelor of Science (Hons) Physics

KP/JPS(A7015)05/14

Physics is a fundamental science that provides a basis for our understanding of the physical world. Whether it is an electron, X-rays or a star, there is an area of study in physics that explains it. Hence, the applications of physics are wide-ranging from electronics, medical science, to space research. This programme is designed to equip students with theoretical and practical knowledge in both the fundamentals of physics as well as in its applications in modern technologies. Students will learn to appreciate and understand physics through a hands-on approach in a laboratory setting with state-of-the-art equipment. Besides academic development, this programme also aims to equip students with the proper communication and entrepreneurial skills. Physics is a subject that develops analytical and problem-solving skills, and the ability to handle large amounts of complex information, all of which are essential for career advancement.

Objectives of Course of Study

1. To allow students to understand, analyse, practise and evaluate the knowledge and skills of a wide range of physics topics.
2. To develop logical and analytical thinking in students, complemented with specialised practical skills.
3. To create well-rounded physicist with skills that are both of value to future employment in various fields of physical sciences, e.g., private and government research & development department, medical instrument department in hospital, manufacturing & microelectronics industry, as well as the ability to be transferable to other avenues of employment.
4. To prepare students to embark on related post-graduate studies which would provide better opportunities and specialised advancement in the relevant areas, with a broad understanding of the principal areas of physics, engineering and supporting disciplines.

Programme Learning Outcomes

- A. Ability to acquire and apply fundamental laws and principles of physics.
- B. Ability to identify, formulate and solve problems in various fields of physics.
- C. Possess technical skills to conduct, analyse and interpret physics experiments.
- D. Ability to use specialized mathematical tools, programming languages and software.
- E. Ability to perform independent investigation of specific physical problems.
- F. Ability to work in groups, to manage and to interact constructively with others.
- G. Recognize the importance of life-long learning and entrepreneurship.
- H. Aware of professional, ethical and social responsibilities as a physicist.
- I. Ability to communicate scientific ideas effectively and unambiguously to professionals and community at large.

Careers

The knowledge and skills acquired from studying this programme can lead to career options both in the public and private sectors. Graduating students can look forward to various career options. In the industries, physics majors can work in companies or commercial laboratories in areas of, for example, silicon wafer fabrication, microelectronics, fiber optics and telecommunications, optical instrumentation, or medical science. Physics graduates can also work in academic institutions. Excellent graduates in physics can continue their careers by furthering their studies and/or working in a university.

Subjects

Year 1

Mathematics for Physics I and II
Electricity and Magnetism
Mechanics and Special Relativity
Physics Laboratory I and II
Electronic Circuits
Digital Electronics
Oscillations and Waves
English for Science
Mathematical Methods for Physics I
Solid State Physics
Semiconductor Physics and Devices

Year 2

Optics
Quantum Mechanics
Mathematical Methods for Physics II
Classical Mechanics
Physics Laboratory III and IV
Atomic and Molecular Physics
Electromagnetism
Computational Physics
Thermal and Statistical Physics
Major Elective I and II
Industrial Training

Year 3

Nuclear Physics
Project
Major Elective III and IV
Minor Elective
Entrepreneurship
Interpersonal Communication
Project Management

Major Electives* (Choose 4 subjects)

Microelectronic Fabrication
Microelectronic Circuit Analysis
Renewable Energy
Characterization of Semiconductor Material and Devices
Process Integration and IC Manufacturing
Optoelectronics

Minor Elective* (Choose 1 subject)

Quantum Computing
Plasma Physics

*Subject to change/availability

MQA Subjects

Bahasa Kebangsaan/Foreign Language
Pengajian Malaysia
Pendidikan Moral/Pengajian Islam

University Subjects

Co-Curriculum
Sun Zi's Art of War and Business Strategies