

## Applied Physics

Our Applied Physics programme offers a balance between the fundamentals of physics and their applications. This programme prepares students for the industrial world where theories and concepts in physics are turned into practical applications. Apart from basic physics, students will learn industry related subjects such as semiconductors, microprocessors, instrumentation, lasers, spectroscopy, materials science and non-destructive testing. In the final year project, some of the theories learned will be put into practice and students will be required to visit factories and attend seminars. Through industrial exposure, students will be well prepared for the job market.

## Geophysics

Geophysics is dedicated to studying the Earth's structure and motion. The main thrust in the programme includes atmospheric science, environmental geophysics, oceanography, rocks and minerals such as petroleum and natural gas. It involves the application of physical laws and principles to a study of the Earth and other astronomical bodies. Geophysical studies employ physical measurements and mathematical models to explore and analyze the structure and dynamics of the solid earth and similar bodies, and their fluid content. During the course, students are required to work as a team in a one-week field camp, aiming for intensive training on various geophysical techniques.

## Pure Physics

Pure Physics is the first programme established in the School of Physics. It provides the foundation for all the other physics programmes. The scope of pure physics encompasses classical mechanics, solid state physics, thermodynamics and statistical mechanics, optics, electromagnetism, and modern physics. Through the Pure Physics programme, we provide you the all-round training in Physics from our pool of research-orientated academic staff. This kind of training in the lecture halls and laboratories lays the strong foundation in Physics which prepares you for your future career. The programme is most relevant to someone who wishes to be a physicist. If you have the passion for Physics, and you appreciate its challenges and prospects, then this should be your choice.



## Medical Physics

Medical Physics is a rapidly expanding discipline which involves the application of physics-based principles and techniques to matters of medical diagnosis and treatment. The subject focused on the use of ionizing radiations in both the diagnostic and therapeutic applications, in particular the diagnostic radiology, computed tomography, radiotherapy and nuclear medicine; new physical techniques in medical instrumentations, e.g. magnetic resonance imaging, ultrasound and medical lasers; medical imaging and applications of computers in medicine. A Medical Physicist is involved in the calibration, maintenance, usage and radiation safety of the various medical instruments used in hospitals and industries.

## Engineering Physics

The thrust of the programme is in materials and devices for information and communication i.e. with emphasis on photonics. Engineering physicists are trained to solve complex engineering problems in a quantitative manner by drawing and synthesizing information from different fields. They are also trained to develop scientific innovations into practical devices. In order to develop such skills students are exposed to a broad knowledge of physics and mathematics as well as an understanding of engineering methods. Students are also taught the methods employed by professional engineers in some of the engineering courses. The design abilities required by a practicing engineer are developed in laboratory work as well as related courses throughout the programme. In this programme, students are required to complete a project that involves the presentation of solutions to a real design problem, normally a practicing engineering physicist is likely to encounter.

# Undergraduate Programme



## General Information

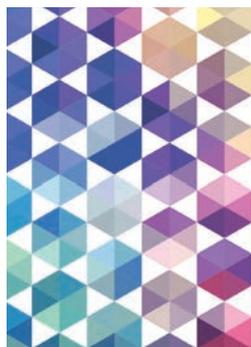
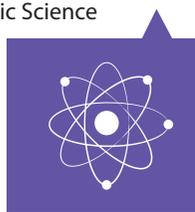
The School of Physics was set up when the University was established in 1969.

The main objective is to produce competent, knowledgeable, creative, and innovative Physics graduates for the nation's rapid growth and progress. To achieve this goal, the School of Physics is offering various relevant programmes and providing many state-of-the-art facilities and know-how for the study of physics and its related disciplines.

Apart from lectures, the School of Physics holds regular scientific seminars presented by invited speakers (local and abroad), our own staffs and research students. Outside the campus, we maintain an astronomical observatory in Pantai Acheh, Pulau Pinang designed for applied astronomy research.

After the completion of undergraduate study, the students can pursue their higher degrees in the School of Physics. Among the postgraduate research areas of thrust are:

- Applied, Engineering Physics and Renewable Energy
- Computational, Theoretical and High Energy Physics
- Condensed Matter Physics and X-Ray Crystallography
- Geophysics, Astronomy and Atmospheric Science
- Medical Physics and Radiation Science



## Undergraduate Programmes

The School of Physics offers a four-year degree with the following five major academic programmes:

- Pure Physics
- Applied Physics
- Geophysics
- Medical Physics
- Engineering Physics

The School of Physics also offers a minor program in astronomy with an objective to provide a general and historical perspective of astronomy and trace its path to modern astronomy, crossing different civilizations Industrial Training Programme. Industrial training, which is optional, is encouraged. Industrial training lasts for 18 weeks, done in semester 2 of the 4th year of study. The purpose of industrial training is to strengthen the relationship between the University and the private and public sectors and provide exposure to working-life for student nearing their completion of undergraduate study. Students will be directly exposed to the real working environment.

## Facilities

The School of Physics houses many scientific facilities and laboratories to support the ongoing teaching and research activities. Some of which are:

- First and Second Year Teaching laboratories
- Computer and CAI laboratories
- Microprocessor laboratory
- Engineering Physics laboratory
- Workshop for Engineering Physics
- Medical Physics laboratory
- Radiation Biophysics laboratory
- X-Ray Crystallography laboratory
- Geophysics laboratory
- Solid State laboratory
- Energy laboratory
- Theoretical Physics laboratory
- Nano-Optoelectronics Research and Technology laboratory (N.O.R Lab)

In these laboratories, students get hands-on experience in handling and using scientific instruments.



## Why Study Physics?

- Fundamental knowledge of science and engineering.
- Innovative and creative thinking.
- Avenue for breakthrough and discovery.
- Role player in leading technology.
- Enhance problem solving reasoning, numeracy and practical skills.

## Why School of Physics, USM?

- Study in APEX University in attractive and conducive environment - a university in a garden.
- 5 outstanding academic programmes.
- Excellent and experienced academic staff.
- State of the art facilities.
- Good track record of employability.

## Taking Physics – Where would you position yourself in future?

- Medical Physicist
- Geophysicist
- Astrophysicist
- Academician
- Scientist
- Consultant
- Engineer
- Researcher
- Entrepreneur
- Teacher



## How to join the programme?

- Apply directly via online through USM website: <https://pohon.usm.my>
- Minimum requirement:
  - STPM or Matriculation or equivalent qualifications with CGPA 3.00
  - 'B' in Physics & One Other Science Subject (Biology, Chemistry or Mathematics)
  - 'B' in Additional Mathematics at SPM if NO Mathematics at STPM

For further enquiries, please contact:

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