



WARWICK

Physics at Warwick

UNDERGRADUATE STUDY **ENTRY 2018**



Physics at Warwick



“Welcome to the Department of Physics at the University of Warwick. Physics is a practical subject full of beautiful ideas. If you study physics as an undergraduate, you will be exploring deep questions about the nature of the universe and developing many useful skills.

This booklet should give you a feeling for what studying with us is like. We look forward to hearing from you and answering any further questions you may have about our courses and the University.”

Danny Steeghs
Head, Undergraduate Admissions



Honours Degree Courses offered by the Department of Physics

Mathematics and Physics and Physics and Business Studies are taught jointly with the Department of Mathematics and the Warwick Business School respectively.

PHYSICS
F300 (BSc)
and F303 (MPhys)

**MATHEMATICS
AND PHYSICS**
GF13 (BSc) and
FG31 (MMathPhys)

**PHYSICS AND
BUSINESS STUDIES**
FN31





Introduction

Physics is about ideas and skills. An important idea is that systems can be understood by identifying a few fundamental quantities, such as energy and momentum, and the universal principles governing them. One of the joys of physics is seeing how a simple principle, established after studying one problem, can go on to explain seemingly unrelated phenomena. For example, the laws of thermodynamics were discovered in the 19th century by people trying to design better steam engines. They turned out to apply to everything in the universe from the big bang onwards. Einstein himself is quoted as saying that thermodynamics “is the only theory of universal content which I am convinced ... will never be overthrown”.

Physics teaches us ways of thinking about and tackling problems. This is just as true when studying the laws governing interactions between individual particles, as it is when studying the implication of these laws for complicated systems made up of many particles. In all cases, the process involves making measurements, trying to solve models of what might be happening, and, hopefully, celebrating when a coherent picture emerges.

Studying physics gives a good general preparation for many different careers. Our graduates work in nearly all parts of the public and private sectors including IT, finance, journalism, and management. Some of our graduates also go on to postgraduate study in physics, usually working towards the research degree of PhD.

Physics at Warwick

Our main entry streams are the Physics course, and the Mathematics and Physics course which is taught jointly with the Department of Mathematics. The courses are designed to challenge you intellectually and to help you to develop general transferable skills.

The courses are built around a flexible curriculum, which, particularly after the first year, allows you to choose a sizeable proportion of your modules from lists of options. You might choose to concentrate on particular areas in physics (and mathematics if you are on the joint course) or try to keep your studies as broad as possible. The need to make choices about which modules to take will encourage you to think about physics in the context of science as a whole, and to develop your own ideas about the relative importance of the various strands within the discipline.

Physics Degree

The structure of the course reflects the structure of the subject. You will take core lecture modules (concentrated mainly in the first two years), which introduce and develop the fundamental concepts, such as those of quantum theory and electromagnetism, and cover the mathematics used in physics.

You will also choose modules from lists of options. These are largely concerned with seeing how the basic concepts can explain the phenomena we observe. Examples include the light emitted and absorbed by stellar matter, and the response of the liquids, solids and gases, which we meet on a daily basis, to the mechanical, electrical and thermal forces acting on them.



As a physics graduate, you should be a practical person. The laboratory work in the course helps you to develop important experimental skills and goes together with other more general skills training in computing, communication and problem solving.

A feature of Warwick is that Departments keep many of their modules open to students from other disciplines. You can opt to take modules in related sciences including mathematics, computing and statistics, or from outside of science altogether. There are modules in business studies, modern languages, philosophy, and other areas. ◀



Teaching

We provide a supportive and friendly environment in which to study. You will learn not just from the lectures and laboratories but also from interacting with others on the course, research students and your friends from outside physics.

Lectures

Lectures are an effective way of presenting information to a large group of students. The 50-minute lectures introduce the material, which you then study further on your own.

The core modules in the first year are supported by weekly classes, at which you and your fellow students meet in small groups with a member of the research staff or a postgraduate student. These classes have two main purposes: to discuss any problems of understanding, which arise from the lectures, and to go through any written work associated with the module. They also provide an important indirect route back to the lecturer for your comments about the lectures.

Laboratories

The laboratory modules teach the essential skills of experimental physics. In broad terms every scientist needs to know how to carry out an investigation, assess its significance and report the results clearly and concisely. As well as developing the techniques of experimental physics, time spent in the laboratory helps illustrate the theoretical aspects of the subject presented in the lectures.

Projects

In your final year, you will work on a research-style project. This is often a very satisfying part of the degree course. It gives you the opportunity to develop your own ideas in a particular field of interest. Usually you will work in a pair, within one of our research groups and alongside postgraduate students and other members of staff. Sometimes the project work can involve interacting with people from other disciplines or from industry.

Personal Tutor

Your personal tutor will be an important contact with the academic staff in the Department. During the first two years, you will meet your personal tutor at weekly tutorials in the first two terms to discuss coursework and to reflect on your studies and planning for future years. Normally your tutor would also be the first person to see about any problem. In the case of more serious worries, your personal tutor will direct you to the University's Senior Tutor, who runs the University's team of professional counsellors and the student support services.

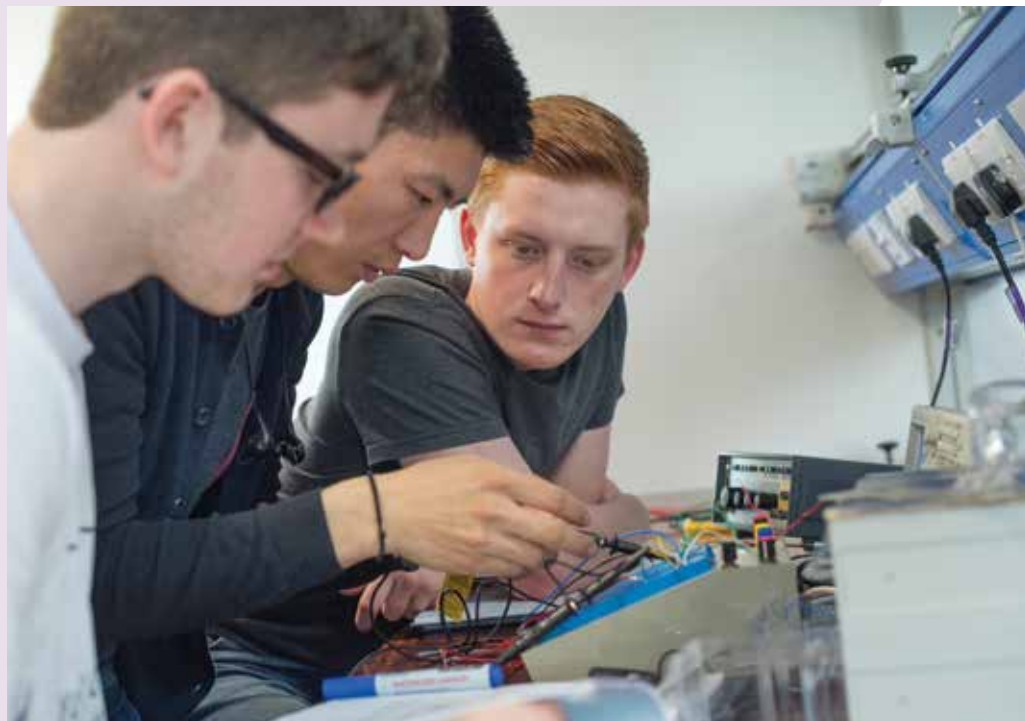
Assessment

Your performance is assessed on the basis of written examinations and coursework. In any year about 30% of the overall mark is assigned to coursework. Coursework components of a degree course include problems set in association with lecture modules, laboratory and computational projects, and modules assessed on the basis of one or more reports.

Feedback

Our staff and student representatives meet regularly on a Staff Student Liaison Committee (SSLC) to discuss any changes and improvements, which can be made to the teaching. ◀





Associated degrees

Mathematics and Physics

This course is one of the best-established Mathematics and Physics joint honours courses in Britain, admitting around 65 students a year. The course has a flavour distinct from the single honours mathematics and physics courses, as a significant proportion of the modules taught by both departments have been designed specifically for joint degree students. The general theme of the course is theoretical physics and the course benefits from the presence in both Departments of staff working in theoretical physics.

There is a large optional component to the degree, which allows you to concentrate on your strengths and interests. The flexibility of the Warwick degree makes it a sensible choice if you are still not sure whether you enjoy one subject more than the other, as it is normally possible to switch to either of the single subject degrees at a later stage.

Physics and Business Studies

If you wish to widen your studies to include business studies, possibly with a view to a career in management or finance, you can opt for the Physics and Business Studies course. In the first two years the course only differs from the physics course in that one second-year business module is compulsory. In the third year, you transfer to Warwick Business School and take all your modules on business-related topics. ◀



The physics community

Apart from teaching, the University's main role is to carry out research. The Higher Education Funding Councils have consistently ranked Warwick amongst the top universities for research in the UK and rated the Department of Physics highly as an individual Department.



The interaction with the research community within the Department brings you into contact with the latest innovations and ideas and is particularly valuable in your final year when you carry out project work.

The Department of Physics has a number of areas of research excellence including: astronomy, the physics of condensed matter, elementary particle physics, plasma physics, theoretical and computational physics.

The other departments which teach physics-based undergraduates – Mathematics, Statistics and WBS (Warwick Business School) – have all been rated highly for their research. ◀



A young man with dark hair and glasses is shown in a laboratory setting. He is wearing a white t-shirt and is looking down at a red funnel. The background is filled with various pieces of scientific equipment, including what appears to be a large camera or microscope. The lighting is warm and focused on the man and the funnel. The image is framed by a large blue triangle on the left side of the page.

Looking ahead

After graduation about 65% of our graduates move directly into employment while 35% go on to further academic training usually in physics, mathematics or computing. The 65% entering employment are made up of around 20% in the financial/accounting sector, 20% in the IT sector and 10% in engineering. The remaining 15% are spread across a range of disciplines, which in recent years have included journalism, the health service and management. ◀

warwick.ac.uk/physics

If you have any questions or need further information after reading this guide, please contact:

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