Next Steps With Physics

A pocket guide to your options at 18

IOP Institute of Physics
Physics Degree

**CORE TOPICS**
In a typical physics degree, you will spend about half of your time studying the core topics of physics, including:
- Particle physics
- Relativity
- Lasers
- Solid-state physics
- Waves and optics
- Statistical physics
- Mechanics
- Quantum physics
- Electromagnetism
- Oscillations
- Thermodynamics

**ADDITIONAL TOPICS**
You might spend the rest of your time studying one of the following:
- Astrophysics
- Cosmology
- Biophysics
- Applied physics
- Atmospheric physics
- Environmental physics
- Medical physics

Alternatively many universities offer courses which allow you to combine studying physics with a completely different subject such as music or a modern language.

**How will I study?**

Studying physics at university usually involves a combination of lectures, tutorials and practical sessions.

Lectures can be for anything between 20 – 300 students in large theatres, tutorials are classes with smaller numbers and practical sessions are taught in specialist laboratories.

The amount of practical work is different depending on the course and university, but you should expect to spend about 15% of your time on practical work.

**Maths**
You will cover mathematics as part of your degree. You will be familiar with many of the concepts; integration, differentiation and vectors and learn new areas of maths required for topics such as quantum mechanics. If the mathematical side of physics appeals to you, then you may want to consider a degree in theoretical physics.

**I chose to study Physics with Mathematics at university because I enjoyed it at A-level and didn’t want to stop learning those types of topic. I enjoy a challenge which is what this course offers but the rewards at the end are what makes everything worth it.**

Sophie, MPhys Physics with Mathematics
Degree Combinations

**BSc Physics with Music Technology**
- BSc degrees involve studying for three years (four in Scotland).
- Physics with courses involve spending about 70% of your time studying physics and the remainder studying another subject.

**MSci Physics and Philosophy**
- MSci degrees involve studying for four years (five in Scotland), which provides more opportunities to develop problem solving, presentation and communication skills.
- Physics and courses involve spending about 50% of your time studying physics and 50% studying another subject.

**MPhys Physics with Industrial Placement**
- MPhys degrees are the same as a MSci degree; these courses simply have different names at different universities.
- An industrial placement or year in industry provides the opportunity to get experience in a company or research lab during your degree. You will be employed full time and earning a salary in an industry which relevant to your chosen degree.

**Astrophysics with Year Abroad**
- Course with a year abroad usually involve spending the two years following a standard degree in a UK university and learning a foreign language if you need this for your time abroad. The third year is then spent studying abroad, before returning to the UK for your final year.
Modern Apprenticeships

Higher and degree level apprenticeships offer a combined package of work and study, meaning that you study towards a qualification with a provider chosen by your employer whilst gaining on the job experience.

Higher apprenticeships are designed to train and prepare you for a particular job or role within a company, meaning once you complete your apprenticeship you will have the qualifications and skill set that match your employer’s needs.

What do they involve?

If you decide to undertake an apprenticeship, you will spend the majority of your week working for your employer (a minimum of 30 hours a week). Depending on your employer, this could involve shadowing senior staff, conducting independent research or publishing papers on your work.

You will be paid for this work; the minimum wage for apprentices is £3.50 an hour, although many employers pay more. You will receive at least 20 days paid holiday a year and some employers offer other workplace benefits.

You are also required to study towards a qualification. There are a number of different ways this might happen, such as attending college, university or a training provider. Your employer will release you, typically for one day a week and you will be paid for the time spent studying. You will not need to pay tuition fees. These costs are met by your employer and the government.

It is important to remember that an apprenticeship can be challenging, you will be expected to achieve both academically and at work and you may also find that it will take longer to complete a degree through an apprenticeship than if you had attended university.

ENTRY REQUIREMENTS

Many employers do not ask for specific grades, however some may specify subjects. In general rather than scrutinising your academic ability, employers are looking for aptitude; enthusiasm and the skill set you have developed by choosing to study physics post 16.
Find out more

**Qubit**
Sign up to our e-newsletter Qubit and receive regular updates from the Institute of Physics on topics including what’s new in physics, exam and university guidance and careers information
iop.org/16-19

**Physics degrees**
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You can search by subject, entry requirements or location.

**Apprenticeships**
England and Ireland
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ams.careerswales.com
Northern Ireland
nidirect.gov.uk/apprenticeships
engineering apprenticeships
tomorrowsengineers.org.uk/apprenticeships

**IOP Membership**
If you’re beginning your journey into physics, whether as an apprentice, trainee or undergraduate, being an Associate Member of the IOP will allow you to be part of a community of like-minded people who share your passion for physics. Membership supports your interests and career aspirations and gives you a respected sign of professionalism and commitment to physics.

To find out more about becoming an Associate Member of the IOP, visit iop.org/associate