Physics

Physicists help answer some of the most important questions facing society: ‘What is the most sustainable energy source for our growing world?’ and ‘How do you cure cancer with radiation?’

What is physics?
Physics is the science of matter and energy and the way they interact. It deals with the physical properties, processes or laws governing the interactions of matter and energy, including the study of the natural world.
The study of physics is traditionally grouped into areas including acoustics (sound), optics (light), mechanics, thermodynamics, and electromagnetism. These areas have expanded to include atomic and nuclear physics, solid-state physics, and computational physics.

What do physicists do?
Physicists work in many areas including acoustics, biophysics, thermal physics, geophysics, teaching, and laser technology as well as other areas of technical development.
They may specialise in three broad roles:
— Theoretical physicists—develop theories or models of how particular aspects of the world work
— Experimental physicists—test these theories, determining their limits and suggest new approaches
— Applied physicists—apply these findings in practical settings, such as within industry and through the introduction of new technology.

Physicists study the behaviour of the physical world and then find practical ways to apply new knowledge gained from research.
They observe and measure phenomena from the smallest subatomic particle through to the universe as a whole. They develop theories and models to explain these phenomena and then use computers to explore and test their theories. In practical ways they can build equipment to make new types of measurement, or develop new materials, products and processes for use in industry, medicine, defence and other areas of research and development.

Where do they work? Who will employ me?
Based on the wide range of specialties in physics, RMIT graduates work in many different industries and organisations. You can be employed as a scientific officer, technical officer, or researcher in many different areas including materials development, defence technology, medical science, acoustics testing in the building industry, or advanced computer modelling. Some work in industrial research and development laboratories at large manufacturing companies such as AMCOR while others work in small specialised firms and consultancies, as teachers, or even as patent specialists.

Physicists are also employed in government research facilities such as CSIRO, Defence Science and Technology Organisation (DSTO), the Aeronautical and Maritime Research Laboratories and the Australian Nuclear Science and Technology Organisation (ANSTO). ANSTO is Australia’s main supplier of radioisotopes for use in medicine and industry. The Bureau of Meteorology recruits physicists each year to work in areas such as forecasting and atmospheric monitoring.
Physicists are also in demand in many areas to operate precision electronic instrumentation, such as scanning electron microscopes used widely in technical development and in major hospitals.

If you are considering a career in physics, you may be interested in...
— Bachelor of Science (Applied Sciences)
— Bachelor of Science (Dean’s Scholar) (Honours)
— Bachelor of Science (Applied Science) and Bachelor of Business (Management) double degree
— Bachelor of Science (Physics) and Bachelor of Engineering (Electronic and Communication Engineering) (Honours) double degree

www.rmit.edu.au/appliedsciences
Physics at RMIT

The applied sciences degree at RMIT allows you to major in one of four fields: applied sciences, applied chemistry, biological sciences or physics.

The physics major incorporates theory and practice to prepare you for a variety of challenging and rewarding careers. It provides options to focus on optics, acoustics, medical physics, computational physics or materials physics.

There is a lot of emphasis on laboratory practice and experimentation. What you learn is often linked to RMIT research projects which include collaboration with industry, other universities, and research and government organisations. This provides opportunities for graduates to gain up-to-date and relevant skills. You can undertake a research project or a work placement in final year.

What you will study

If you decide to major in physics as part of your science degree, you will start to study courses towards your major in second semester of first year. However, if you change your mind the degree is flexible enough to allow you to switch majors in second year.

Depending on the subjects you have studied at VCE level, below is an example of some of the courses you will study towards your physics major.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Name</th>
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<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Cell structure and function (VCE) or Biology (non-VCE)</td>
<td>Chemistry of materials 1 (VCE) or Chemistry principles (non-VCE)</td>
<td>Modern physics (VCE) or Physics for leaders (non-VCE)</td>
<td>Scientific skills and communication</td>
</tr>
<tr>
<td>2</td>
<td>Calculus 1</td>
<td>Mechanics</td>
<td>Thermodynamics and electromagnetism</td>
<td>Science elective</td>
</tr>
<tr>
<td>3</td>
<td>Calculus 2</td>
<td>Materials and thermal physics</td>
<td>Optics and radiation physics</td>
<td>Science elective</td>
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<tr>
<td>4</td>
<td>Mathematics for physicists</td>
<td>Electromagnetics and quantum physics</td>
<td>Student elective</td>
<td>Science elective</td>
</tr>
<tr>
<td>5</td>
<td>Quantum and statistical physics</td>
<td>Applied physics</td>
<td>Professional scientist</td>
<td>Student elective</td>
</tr>
<tr>
<td>6</td>
<td>Photonics and nuclear physics</td>
<td>Solid state physics</td>
<td>Science project</td>
<td>Science elective</td>
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</tbody>
</table>

"Throughout my studies I have been able to apply my skills and knowledge in real-life work environments. During my undergraduate program I completed a work placement at the Australian Synchrotron where I was placed with the Accelerator Science research group."

"This allowed me to learn a lot about how research groups operate as well as practical scientific skills that are relevant to my work to this day."

Stephanie Keehan
Doctor of Philosophy (PhD) (Physics)