

# PHYSICS AND ASTRONOMY (PHYS)

## PHYS 0001 Foundation Physics 1 (WSTC Prep) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys0001/>) **Legacy Code:** 700144

This subject replaces 700026 - Physics (UWSCFS) from Term 1 2014. This subject provides a brief introduction to the essentials of Physics. This subject is focused on skills and knowledge that students from a variety of science, construction and engineering courses need in their first year of study. Students cover introductory topics in Mechanics, Energy and Power, Electricity and waves.

**Level:** Undergraduate Level 0 Preparatory subject

**Equivalent Subjects:** PHYS 0002 - Foundation Physics 1 (UWSC)

**Incompatible Subjects:** PHYS 0006 - Physics (UWSCFS) PHYS 0005 - Physics (UWSC)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PHYS 0002 Foundation Physics 1 (WSTC) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys0002/>) **Legacy Code:** 900079

This subject provides a brief introduction to the essentials of Physics. This subject is focused on skills and knowledge that students from a variety of science, construction and engineering courses need in their first year of study. Students cover introductory topics in Mechanics, Energy and Power, Electricity and Waves.

**Level:** Undergraduate Level 0 Preparatory subject

**Equivalent Subjects:** PHYS 0001 - Foundation Physics 1 (WSTC)

**Incompatible Subjects:** LGYB 1383 - Physics (WSTC) PHYS 0006 - Physics (WSTC Prep)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PHYS 0003 Foundation Physics 2 (WSTC Prep) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys0003/>) **Legacy Code:** 700145

This subject provides students with the background knowledge and skills in physics needed for Engineering courses. Students will cover more advanced content in Mechanics, Electricity, Magnetism and waves.

**Level:** Undergraduate Level 0 Preparatory subject

**Pre-requisite(s):** Students enrolled in 7066 Diploma in Engineering Extended must have passed PHYS 0001 Foundation Physics

**Equivalent Subjects:** PHYS 0004 - Foundation Physics 2 (UWSC)

**Incompatible Subjects:** LGYB 1383 - Physics (UWSC) PHYS 0006 - Physics (UWSCFS)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PHYS 0004 Foundation Physics 2 (WSTC) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys0004/>) **Legacy Code:** 900080

This subject provides students with the background knowledge and skills in physics needed for Engineering courses. Students will cover more advanced content in Mechanics, Electricity, Magnetism and waves.

**Level:** Undergraduate Level 0 Preparatory subject

**Pre-requisite(s):** PHYS 0002

**Equivalent Subjects:** PHYS 0003 - Foundation Physics 2 (UWSCFS)

**Incompatible Subjects:** PHYS 0005 - Physics (UWSC) PHYS 0006 - Physics (UWSCFS)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PHYS 0006 Physics (WSTC Prep) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys0006/>) **Legacy Code:** 700026

This subject serves as an introduction to the fundamentals of physics with appropriate applications in a wide range of engineering areas.

**Level:** Undergraduate Level 0 Preparatory subject

**Equivalent Subjects:** PHYS 0005 - Physics (UWSC)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PHYS 1002 Physics 1 (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys1002/>) **Legacy Code:** 300828

Physics is the study of the fundamental nature of matter, energy, space-time, and motion. It uses conceptual, mathematical and experimental tools to achieve this understanding. In this subject, we survey mechanics, electromagnetism, optics and thermal physics, and briefly consider relativity, quantum physics and nuclear physics. Conceptual, mathematical and experimental understanding of physics will be developed, and the use of the tools of physics (e.g. estimation, uncertainty, dimensional analysis) will be introduced. This subject provides non-specialists (e.g. students in other majors and aspiring secondary teachers) with a good basic overview of the subject, and prepares specialist students for further study.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** PHYS 1003 - Physics 1 PHYS 1004 Physics 1 (WSTC)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PHYS 1004 Physics 1 (WSTC) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys1004/>) **Legacy Code:** 700035

This subject provides an introduction to physics for science and medical science students as well as providing a basis for further study of more advanced physics for students pursuing courses in nanotechnology, chemical, physical and mathematical sciences. It provides a foundation to understand the physical principles which underlay scientific instrumentation and analysis. Topics covered include systems of units; Introductory mechanics, Newton's laws, work, conservation of energy and momentum; Electricity, electrostatics, DC and AC circuits and components, introductory electromagnetism; Waves and optics, electromagnetic radiation, reflection, refraction, image formation, polarisation, interference and diffraction.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** LGYA 3630 - Engineering Physics PHYS 1001 - Physics 1 LGYA 5727 - Physics 1D PHYS 1003 - Physics 1 PHYS 1002 - Physics 1

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PHYS 1006 Physics 2 (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys1006/>) **Legacy Code:** 300829

This subject develops a deeper understanding of physics for students pursuing courses in nanotechnology, chemical, physical and mathematical sciences. Topics covered include Mechanics: Equilibrium, stress and strain, harmonic oscillators, rotational motion, moment of inertia. Gravitation, types of force in nature. Thermal Physics: temperature, specific & latent heat, heat transfer, kinetic theory of gases, first law of thermodynamics, isothermal, isobaric & adiabatic processes. Introduction to Modern Physics: special relativity, time dilation, length contraction, momentum, mass, rest energy, velocity addition. Basic quantum theory, Planck's hypothesis, wave nature of matter, quantum mechanical view of atoms. Nuclear physics, radiation, half-life, nuclear reactions.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** LGYA 6150 - Physics 2

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PHYS 2004 The Cosmos in Perspective: Information and Life (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys2004/>) **Legacy Code:** 300966

From the Big Bang to the end of the Universe, from our own Solar System to the farthest superclusters of galaxies, our knowledge of the Universe is growing at an amazing rate. This subject will explore the cosmos at scales from planets to the edge of the visible universe. We develop an appreciation of the processes of science, and an understanding of how astrophysicists know what they know. We will consider cultural perspectives on the cosmos, including that of indigenous Australians. We will consider our place in the cosmos: the requirements for life to exist, and the possibility of other life in the Universe.

**Level:** Undergraduate Level 2 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PHYS 3001 Astroinformatics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys3001/>) **Legacy Code:** 300916

Modern astronomy is strongly driven by large datasets, which require advanced computing procedures to analyse. Students will learn about the science of stars, planets and galaxies; the use of computers in science; and how to formulate and solve challenging problems in modern science using high-level computer skills. These skills are highly transferable to other occupations.

**Level:** Undergraduate Level 3 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PHYS 3006 Classical Physics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys3006/>) **Legacy Code:** 301262

This subject covers the key components of classical physics to the advanced level expected of a physics major. Newtonian mechanics will focus on realistic problems, in three dimensions and in the presence of friction and drag. Electromagnetism introduces Maxwell's equations, and applies them in the presence of matter. Thermodynamics is presented rigorously, focusing on the most general forms of the first and second laws. We will also introduce the basic elements of statistical physics. Fluids and waves will introduce the basic equations of fluids, and in particular the full (PDE) wave equation and its solution.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** PHYS 1006

**Incompatible Subjects:** CHEM 2003 Classical Physics and Applied Technologies

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PHYS 3007 Quantum Physics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys3007/>) **Legacy Code:** 301392

The subject builds on quantum concepts that have been introduced in earlier subjects such as Physics 1,2, Nanotechnology and Chemistry. It aims at developing the student's understanding of quantum principles as they apply to hard and soft matter systems, including atoms, molecules and extended arrays such as metal and semiconductors as well as biological tissue

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** PHYS 1006 - Physics 2

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PHYS 3008 Biomedical Physics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys3008/>) **Legacy Code:** 301459

Students completing this subject will be able to apply the principles and practice of physics to advanced biomedical applications, to critically analyse data regarding, and solve problems involving the physics of living systems, and to work with a range of advanced instrumentation. This subject will provide advanced training in biomedical physics and prepare students for career pathways in medical and biomedical physics. The subject content includes concepts of diffusion and Brownian motion; applications of thermodynamics to biological systems and the origin of life; biomolecular self-assembly; nuclear magnetic resonance and magnetic resonance imaging; atomic force microscopy; molecular dynamics simulations; biophotonics; and nuclear and radiation physics in biomedical sciences.

**Level:** Undergraduate Level 3 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PHYS 9001 Higher Degree Research Thesis - Physics (80 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/phys9001/>) **Legacy Code:** 800121

**Level:** PhD and Research Masters Level 9 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject