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 2005 Classical Physics and Advanced Technologies (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/phys2005/) **Legacy Code:** 301393
This subject explains in depth aspects of classical mechanics related to forced and damped oscillations. Physical waves are introduced and formalized by describing applications of the wave equation to mechanical systems and electromagnetic radiation. Interference and diffraction are detailed using electromagnetic fields (physical optics). Main technological applications of mechanical oscillations and electromagnetic waves are also explained, such as the atomic force microscope, laser, optical tweezers and the zeta-sizer.
Level: Undergraduate Level 2 subject
Pre-requisite(s): PHYS 1006
Equivalent Subjects: LGYA 6024 - Applied Instrumentation in Nanotechnology
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 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
Pre-requisite(s): PHYS 1006 - Physics 2
Restrictions: Please see the Subject Details page for any restrictions for this subject

PHYS 7001 A Cosmic Perspective (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/phys7001/) **Legacy Code:** 301247
The subject explores and challenges scientific as well as cultural perspectives on the cosmos, from its composition, expansion and the development and endings of the stars and planets, to life, its limits, evolution and mass extinctions on Earth. The subject also considers the development of consciousness, astrology vs astronomy, expanding horizons, space travel and space exploration.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

PHYS 7002 Space Instrumentation, Technology and Communication (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/phys7002/) **Legacy Code:** 301248
The Space Instrumentation, Technology and Communication subject is focussed on the application of space technology in industrial settings. Its main objective is to provide a sound knowledge of the underlying principles which form a thorough basis for careers in space technology, satellite communications and related fields. This subject gives the student grounding in the technologies used in space science. By considering the underlying scientific principles and case studies of the instrumentation used in space, students will not only understand the current state of the art in space science, but also the foundations of the field in order to be able to stay current in this fast-moving field. Content includes but is not limited to: Imaging, Detectors, Principles of Communication, and Principles of Space Technology.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

PHYS 7003 Space Science, Planetary Science and Meteorology (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/phys7003/) **Legacy Code:** 301249
This subject examines the six key priorities of the Australian Space Agency: communication, space debris monitoring, navigation and positioning, Earth observation, space technology research and development, and remote asset management. Students will examine the Sun and Solar System, planetary science, meteorology, and the physics of rockets and satellites. Students will explore the interconnections between the Earth land, ocean, atmosphere, and life of our planet in the era of modern satellite technologies. These include the critical review of our understanding about the cycles of water, carbon, rock, and other materials that continuously shape, influence, and sustain Earth and its inhabitants. Students will also be able to design new models of the cyclical interactions between the Earth system and the Sun, Moon and will discover the fundamental processes which define our Universe and our planet.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

PHYS 9001 Higher Degree Research Thesis - Physics (10,20 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