# EARTH SCIENCES (EART)

**EART 2001 Climate Change Science (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart2001/) Legacy Code:** 300837
A factual understanding of the energy balance of the globe, how this impacts on climate and how climate has varied in the past, is essential for any person working in the climate change area. This subject will introduce students to the concept of energy balance and climate, our understanding of how climate works, and how it has changed through time. Topics in basic atmospheric science will give students a critical understanding of current environmental concerns and debates about radiative forcing (the greenhouse effect), climate change, ozone depletion, photochemical pollution and acid precipitation.
**Level:** Undergraduate Level 2 subject
**Equivalent Subjects:** LGYA 6248 - Atmospheric Science
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 2004 Soils and Substrates (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart2004/)**
This subject provides you with a basic understanding of soil formation and erosion processes, soil physical, chemical and biological properties, and the diversity and classification of soils in the Australian landscape. These basic principles, along with alternative substrates, are explored in relation to the sustainable management of soils and substrates for horticultural and agricultural production and for environmental management and other land uses. The practical sessions are designed to reinforce the lecture material and include field description and analysis of soil profiles and properties, soil sampling principles and practice, laboratory measurement of soil and substrate physical and chemical properties essential/important for plant growth, soil/substrate biology.
**Level:** Undergraduate Level 2 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 3001 Biological Adaptation to Climate Change (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart3001/) Legacy Code:** 300909
This subject investigates how organisms respond to variation in climate and what can be done to reduce their vulnerability to anthropogenic climate change. The subject makes use of a novel conceptual framework that defines 'vulnerability' as a function of the 'exposure' and 'sensitivity' of organisms to climate change. Therefore, we will begin by exploring how organisms are exposed to climate change, from regional climatic changes acting at the scale of populations, to local climatological effects acting at the scale of individuals. Next, we will examine what determines the sensitivity of organisms, focusing on the physiological, behavioural, and life-history traits that affect the ability of organisms to cope with and adapt to climate change. Then, we will show how exposure and sensitivity combine to determine the vulnerability of organisms, including in both managed and natural ecosystems. Finally, we will discuss the 'mitigation' and 'adaptation' strategies that can prevent the worst of the potential impacts from becoming realised and help protect our biodiversity in the face of anthropogenic climate change.
**Level:** Undergraduate Level 3 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 3005 Statistical Hydrology (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart3005/) Legacy Code:** 300991
This subject covers the principles of statistical hydrology. It explores at-site flood frequency analysis, regional flood frequency analysis, trend analysis of hydrological data, linear regression analysis and multivariate statistical techniques to solve hydrological problems.
**Level:** Undergraduate Level 3 subject
**Pre-requisite(s):** EART 4001
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 3006 Science of the Anthropocene (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart3006/) Legacy Code:** 301212
The subject explores how the earth has been irreversibly altered through human activities. Topics include-the composition of the ocean, land, and atmosphere, and the impacts humans have had on these systems. The subject looks at the detection and control of modern pollutants with a focus on field sampling and modelling of selected environmental systems. These topics will be brought to life in a two-day field trip to sites of significant anthropogenic impact.
**Level:** Undergraduate Level 3 subject
**Equivalent Subjects:** EART 3002 Environmental Geochemistry
EART 3003 Environmental Geochemistry
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 3007 Land Degradation and Contamination (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart3007/) Legacy Code:** 301273
This subject will examine current interdisciplinary topics on land degradation and contamination in both urban, peri-urbanand rural environments. The effects of the various human induced land degradation and contamination processes and pollutants in terrestrial environments will be explored and how impacts can be ameliorated and managed. The focus is on both the science of environmental pollutants and on the remediation strategies currently available. Topics include; basic concepts of soils, study of the processes, common soil pollutants, persistent organic contaminants and pesticides, acidification of soils, quantitative risk assessment, land reclamation, and landfill sites
**Level:** Undergraduate Level 3 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 3008 Soils and Substrates (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart3008/) Legacy Code:** 301446
This subject provides you with a basic understanding of soil formation and erosion processes, soil physical, chemical and biological properties, and the diversity and classification of soils in the Australian landscape. These basic principles, along with alternative substrates, are explored in relation to the sustainable management of soils and substrates for horticultural and agricultural production and for environmental management and other land uses. The practical sessions are designed to reinforce the lecture material and include field description and analysis of soil profiles and properties, soil sampling principles and practice, laboratory measurement of soil and substrate physical and chemical properties essential/important for plant growth, soil/substrate biology.
**Level:** Undergraduate Level 3 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 7001 Advanced Hydrogeology (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart7001/) Legacy Code:** 301014
This subject covers occurrence of groundwater, groundwater movement, groundwater hydraulics, water wells, quality of groundwater, groundwater modelling and groundwater management. The objectives of this subject are to enable students to learn the associated concept of groundwater and apply the learnt concepts in solving groundwater problems in advanced engineering practice.
**Level:** Postgraduate Coursework Level 7 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 7002 Advanced Statistical Hydrology (10 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart7002/) Legacy Code:** 301013
This subject covers at-site flood frequency analysis, regional flood frequency analysis, trend analysis of hydrological data, linear regression analysis and multivariate statistical techniques to solve advanced hydrological problems.
**Level:** Postgraduate Coursework Level 7 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 9001 Higher Degree Research Thesis - Hydrology (80 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart9001/) Legacy Code:** 800079
**Level:** PhD and Research Masters Level 9 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**EART 9002 Higher Degree Research Thesis - Soil Science (80 Credit Points)**
**Subject Details (https://hbook.westernsydney.edu.au/subject-details/eart9002/) Legacy Code:** 800077
**Level:** PhD and Research Masters Level 9 subject
**Restrictions:** Please see the Subject Details page for any restrictions for this subject