

# CIVIL ENGINEERING (CIVL)

## CIVL 1001 Surveying for Engineers (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil1001/>) **Legacy Code:** 300738

This is a core subject which provides students with basic skills that are required to carry-out Surveying. After the completion of this subject, students will be able to carry-out required preliminary surveying for most of the civil and construction engineering projects. This subject will also serve as a foundation for most of the subjects that follow in the course.

**Level:** Undergraduate Level 1 subject

**Pre-requisite(s):** MATH 1016

**Equivalent Subjects:** CIVL 1002 - Surveying for Engineering CIVL 1003 - Surveying for Engineers (WSTC AssocD)

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

## CIVL 1003 Surveying for Engineers (WSTC AssocD) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil1003/>) **Legacy Code:** 700120

This subject provides students with basic skills that are required to carry out surveying. After the completion of this subject, students will be able to carry out required preliminary surveying for most of the civil and construction engineering projects. Offerings of alternate subjects are dependent on there being sufficient student enrolment numbers. If enrolments are low, the College may cancel delivery of the alternate subject.0

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** CIVL 1001 - Surveying for Engineers

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

## CIVL 2002 Environmental Engineering (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2002/>) **Legacy Code:** 300737

This subject teaches the fundamental theory and methods of environmental engineering required for students studying civil engineering and other disciplines. Students will explore a wide range of issues including water quality and treatment, waste management, and air and noise pollution in order to solve environmental issues in a sustainable manner. To provide experience in real world professional applications of their learning students will generate a portfolio in addition to participating in a group project, labs and a field trip.

**Level:** Undergraduate Level 2 subject

**Equivalent Subjects:** CIVL 4006 - Environmental Engineering

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

## CIVL 2003 Fluid Mechanics (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2003/>) **Legacy Code:** 300762

This subject provides a basic understanding of fluid mechanics principles. Fluid mechanics is the study of the properties and movements of fluids, and key to understanding many of our engineering systems involving fluids, such as power generation, lubrication, irrigation and navigation. While the main focus is on incompressible fluids, effects of compressible fluids are also discussed. The theories learned in classes are reinforced in laboratory sessions. Students analyse fluid systems and apply principles in designing basic pipes and open-channels.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** MATH 1016 AND

ENGR 1011 OR

ENGR 1028

**Equivalent Subjects:** CIVL 2015 - Water Engineering CIVL 2004 - Fluid Mechanics (WSTC Assoc Deg)

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

## CIVL 2004 Fluid Mechanics (WSTC AssocD) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2004/>) **Legacy Code:** 700111

The subject provides a basic understanding of fluid mechanics principles. While the main focus will remain on incompressible fluids, effects of compressible fluids will also be discussed. The theories learned in classes will be reinforced in laboratory sessions. Offerings of alternate subjects are dependent on there being sufficient student enrolment numbers. If enrolments are low, the College may cancel delivery of the alternate subject.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** MATH 1017 AND

ENGR 1012

**Equivalent Subjects:** CIVL 2003 - Fluid Mechanics

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

## CIVL 2007 Introduction to Structural Engineering (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2007/>) **Legacy Code:** 300733

This subject covers the basic concepts in analysing and designing simple structural members. It consists of the fundamentals of structural analysis, concrete structures and steel structures

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** MECH 2003

**Equivalent Subjects:** CIVL 2006 - Introduction to Structural Engineering CIVL 2008 - Introduction to Structural Engineering (WSTC Assoc Deg)

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

## CIVL 2008 Introduction to Structural Engineering (WSTC AssocD) (10 Credit Points)

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2008/>) **Legacy Code:** 700115

This subject covers the basic concepts in analysing and designing simple structural members. It consists of the fundamentals of structural analysis, concrete structures and steel structures. Offerings of alternate subjects are dependent on there being sufficient student enrolment numbers. If enrolments are low, the College may cancel delivery of the alternate subject.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** MECH 2004

**Equivalent Subjects:** CIVL 2007 - Introduction to Structural Engineering

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

**CIVL 2012 Soil Mechanics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2012/>) **Legacy Code:** 300985

This is an introductory subject covering the use of soil, and the water in it, as an engineering material. It will provide students with a basic understanding of the physical and mechanical properties of soils, simple soil testing methods to characterise soil strength and deformation behaviour, and how to apply basic techniques to assess the hydro-mechanical response of soils subjected to loading.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** MATH 1016

**Equivalent Subjects:** CIVL 2011 - Soil Engineering CIVL 2013 - Soil Mechanics (WSTC AssocD)

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

**CIVL 2013 Soil Mechanics (WSTC AssocD) (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2013/>) **Legacy Code:** 700245

This subject is an introductory subject covering the use of soil, and the water in it, as an engineering material. It will provide students with a basic understanding of the physical and mechanical properties of soils, simple soil testing methods to characterise soil strength and deformation behaviour and how to apply basic techniques to assess the hydro-mechanical response of soils subjected to loading. Offerings of alternate subjects are dependent on there being sufficient student enrolment numbers. If enrolments are low, the College may cancel delivery of the alternate subject.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** MATH 1017

**Equivalent Subjects:** CIVL 2011 - Soil Engineering CIVL 2012 - Soil Mechanics

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

**CIVL 2016 Civil and Substructure (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2016/>) **Legacy Code:** 301220

This subject provides an overview of civil construction and associated sub-structure works comprising footings, pilings and slabs and the high costs associated with these elements. Through site surveys, site assessments and design proposals students will apply their developing understanding of bulk excavation, site drainage, service mains (electricity, gas, water, sewerage, data), roads and retaining walls to real world examples. Students will also examine public infrastructure such as ports, tunnels, bridges and highways to deepen their knowledge base. Additionally, in order to further understand the high costs involved in sub structure works, students will learn to identify problems faced on sites including rock, chemically-aggressive soils and water-logged sites.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** BLDG 1017 OR

BLDG 1014

**Co-requisite(s):** BLDG 1018 OR

BLDG 1015

**Equivalent Subjects:** CIVL 2001 Construction Technology 1 (Civil)

BLDG 2007 Construction Technology 2 (Sub-structure)

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

**CIVL 2017 Sustainable Construction Materials (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2017/>) **Legacy Code:** 301399

This subject focusses on the suitability for purpose (performance, durability, sustainability and standards and regulatory compliance) of building and construction materials. Students investigate the physical properties and behaviour of various timbers, metals, concretes, polymers, new materials and composite systems, and their durability within Australia's diverse environments. Students also consider sustainable and eco-friendly construction materials in life-cycle assessment of construction systems and materials selection at the design stage.

**Level:** Undergraduate Level 2 subject

**Incompatible Subjects:** CIVL 2009 - Material Science in Construction

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

**CIVL 2018 Water Supply Systems Design (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil2018/>) **Legacy Code:** 301424

In this subject students will examine the quality of water and the standards to be met for the supply of water that is fit for its intended use. The design of treatment processes to meet these standards as well as principles underlying the hydraulic design of the treatment systems are examined in the context of both urban and remote rural communities. Students will also explore alternative supply systems and their merits and demerits, including economic viability, in order to gain design and analysis skills with respect to various water supply systems.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** CIVL 2002 OR

ENGR 1050 AND

CIVL 2003

**Co-requisite(s):** CIVL 3011

**Equivalent Subjects:** CIVL 4014 Water and Wastewater Treatment

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

**CIVL 3002 Concrete Structures (UG) (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3002/>) **Legacy Code:** 300736

This subject covers the basic elements of structural behaviour and design with reinforced and pre-stressed concrete. Students will learn to analyse the section capacity of reinforced concrete beams, slabs, and columns, and design simple suspended structures. The subject places a strong emphasis on the process of structural design.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2007

**Co-requisite(s):** CIVL 3014

**Equivalent Subjects:** CIVL 3001 - Concrete Structures (UG)

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

**CIVL 3007 Engineering Geomechanics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3007/>) **Legacy Code:** 301001

This subject will present the application of principles of soil mechanics to the solution of foundation and geotechnical problems including the evaluation of allowable bearing capacity of shallow and pile foundations, the stability of earth retaining structures and the stability of slopes.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 3014 AND

CIVL 2012 OR

CIVL 2011

**Equivalent Subjects:** CIVL 3008 - Foundation Engineering

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

**CIVL 3010 Highway Infrastructure (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3010/>) **Legacy Code:** 300988

This subject focuses on two key aspects of highway infrastructure design, namely, the bridge superstructure design and the foundation soil preparation prior to construction of the highway pavement. It aims to provide students with specialised knowledge in bridge loading and structural design, methods to deal with soft and weak grounds, and building of earth embankments to support the highway pavement.

These aspects will be discussed in relation to Australian design codes.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2007 AND

CIVL 2012

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

**CIVL 3011 Hydraulics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3011/>) **Legacy Code:** 300765

The subject covers the principles of open channel hydraulics, pipe hydraulics and culvert hydraulics. Specific topics in open channel hydraulics include uniform flow, resistance equations, specific energy principle, flow types, gradually varied flow and rapidly varied flow. The purpose is to enable design of efficient open channels to meet engineering requirements. In addition, principles of pipe and culvert hydraulics are introduced, enabling analysis and design of pipe networks and culverts.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2003

**Equivalent Subjects:** -

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

**CIVL 3012 Steel Structures (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3012/>) **Legacy Code:** 300730

This subject covers the basic behaviour of steel members and structures, the appropriate methods to analyse them and the design criteria and methods used to proportion them.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2007

**Co-requisite(s):** CIVL 3014

**Equivalent Subjects:** CIVL 3013 - Steel Structures

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

**CIVL 3014 Structural Analysis (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3014/>) **Legacy Code:** 300732

This subject introduces students to the aspects of structural analysis of trusses, beams and frames. It covers the first-order elastic analysis of statically determinate and indeterminate structures. This course aims to teach students to master basic skills in structural analysis as well as skills in using computer software to analyse complex structures.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2007

**Equivalent Subjects:** CIVL 3015 - Structural Analysis

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

**CIVL 3016 Building Superstructure (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3016/>) **Legacy Code:** 301221

The aim of this subject is to provide students with an understanding of the factors that contribute to the design and construction of a building superstructure. Students will be introduced to relevant Australian Standards for common construction materials and practices. The subject also aims to develop the ability of construction students to communicate professionally with other building professionals including structural engineers. Emphasis will be given to the strength, behaviour and failure of structural members, connections and frames.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** BLDG 1017 or

BLDG 1014

**Co-requisite(s):** CIVL2016

**Equivalent Subjects:** CIVL3004

CIVL3005

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

**CIVL 3017 Construction Scheduling (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3017/>) **Legacy Code:** 301230

This subject is intended to provide students with the skills and ability to organise the resources required for a major construction project, to plan the sequence and timing of construction operations, and to assess the risk inherent in achieving a construction schedule.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** BLDG 1005 OR

BLDG 1014 OR

GEOM 2001 OR

BLDG 2002

**Equivalent Subjects:** BLDG 3005 Construction Planning

CIVL 3003 Construction Planning

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

**CIVL 3018 Hydrogeology (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3018/>) **Legacy Code:** 301397

This subject covers principles of hydrogeology. It contains concepts related to 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 concept of groundwater and apply the learnt concepts in solving groundwater problems in engineering practice.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2003

**Equivalent Subjects:** EART 3004 - Hydrogeology

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

**CIVL 3019 Wastewater Systems Design (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3019/>) **Legacy Code:** 301426

Providing clean water and sanitation is one of the United Nations Sustainable Development Goals. Students will gain knowledge and skills in designing and proposing modifications to current wastewater and sanitation practices. Students will examine conventional processes and explore how they should be modified to address emerging issues (contaminants, climate variability) and how the potential of wastewater as a resource can be realised. Students will also identify various ways smart technologies can be adopted in addressing the challenges facing wastewater disposal/resource recovery.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2003 AND

CIVL 2002 OR

ENGR 1050 OR

PROC 1006

**Equivalent Subjects:** CIVL 4014 - Water and Wastewater Treatment

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

**CIVL 3020 Sustainable Waste Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3020/>) **Legacy Code:** 301422

Sustainable waste management is an important consideration for any student who is training to become an engineer, as waste is produced in all engineering fields. In this subject students will identify and characterise sources of solid and hazardous waste generated in the community. The application of circular economy and zero waste principles are examined alongside real-world case studies to focus on sustainable management of waste incorporating minimisation, recycle, recovery and disposable options.

**Level:** Undergraduate Level 3 subject

**Equivalent Subjects:** CIVL 4011 Waste Management

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

**CIVL 3021 Bridge Engineering Design (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3021/>)

This subject focuses on one key aspect of bridge engineering design, namely, the bridge superstructure design. It aims to provide students with specialised knowledge in bridge loading, the types of possible loads, calculation of ultimate load combinations and investigate the different sizes for the beams (girders) of simple bridge design and structural design. These aspects will be discussed in relation to Australian design codes to prepare students for roles such as design engineer or analyst. Furthermore, this subject will involve industry guest speakers, with state of the art engineering design, who will be able to review and contribute to the assessment tasks.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 3002 Concrete Structures (UG)

CIVL 3012 Steel Structures

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

**CIVL 3022 Bridge Embankment Design (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil3022/>)

This subject focuses on the design of a real-world highway bridge approach embankment on soft ground. It aims to provide students with specialised knowledge covering ground improvement to support the approach embankment, characterisation of the foundation soil based on real site investigation data, loading combinations, settlement and stability considerations. The design will be taught with reference to relevant Australian and international design codes adopted by Australian industry. Industry speakers will be invited to provide industry perspective and insights of embankment design. The knowledge and skills developed in this subject will prepare students for roles as geotechnical design engineers.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** CIVL 2012 Soil Mechanics

AND

ENGR 2016 Pavement Materials and Design

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

**CIVL 4001 Applied Mechanics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4001/>) **Legacy Code:** 300986

Applied mechanics deals with the mechanical responses of structural components under various loading and support conditions. This subject will introduce the theoretical foundations and solution methods for the stability and dynamic responses of beams, columns and plates and their associated applications in engineering practices.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 3014

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

**CIVL 4002 Composite Structures (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4002/>) **Legacy Code:** 300987

This subject builds on knowledge gained in steel and concrete structures, especially the design of structural members using either steel or concrete. Students will learn the design of composite beams, floors, columns and connections based on Australian and International standards as well as mechanics of materials.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 3012 AND

CIVL 3002

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

**CIVL 4003 Construction Technology 5 (Envelope) (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4003/>) **Legacy Code:** 200471

After undertaking this unit, you should understand the way internal spaces are designed and constructed to optimise thermal, visual and acoustic comfort and for energy efficiency.

**Level:** Undergraduate Level 4 subject

**Co-requisite(s):** Students in 2607 Bachelor of Construction

Management must enrol in BLDG 4012 Industry Based Learning before enrolling in this unit

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

**CIVL 4004 Construction Technology 6 (Services) (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4004/>) **Legacy Code:** 300725

To provide students with a vehicle to develop knowledge and skills needed to comprehend the design of services in major buildings, and in so doing engender a life-long interpretation of the intricacies of physical installation and their critical sequence in the construction process.

**Level:** Undergraduate Level 4 subject

**Equivalent Subjects:** LGYB 5400 Construction Technology 6 (Services)

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

**CIVL 4008 Pile Foundations (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4008/>) **Legacy Code:** 300990

This subject covers analysis and design criteria for pile foundations subjected to axial, lateral and dynamic loading based on the Australian Standards. Computer software necessary to carry out analysis and design will be introduced. Also field testing methods available for pile integrity testing will be discussed.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 3007 OR

CIVL 3008

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

**CIVL 4009 Timber Structures (UG) (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4009/>) **Legacy Code:** 300739

Students learn about the engineering properties of timber and assess it as a construction material. Design methods based on structural mechanics are covered including the design of members and connections.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 2007

**Co-requisite(s):** CIVL 3014

**Equivalent Subjects:** LGYB 1031 - Timber Structures (UG)

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

**CIVL 4010 Transportation Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4010/>) **Legacy Code:** 300982

This subject provides students with the course material that will assist them with the execution of Civil Engineering Construction and Urban Development / Town Planning projects. The subject mainly focuses on the planning, design and construction of transportation facilities for urban and rural areas. Students will have an opportunity to implement the skills learnt using a case of a subdivision development.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 1001 AND

ENGR 2016 AND

EART 4001

**Incompatible Subjects:** CIVL 2005 - Infrastructure Engineering

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

**CIVL 4011 Waste Management (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4011/>) **Legacy Code:** 300994

Sustainable waste management, to reduce climate impact, is an important consideration for any student who is getting trained as an engineer. In this subject students will identify and characterise sources of atmospheric, solid and hazardous waste generated from the community. Students will then focus on sustainable management of waste incorporating minimisation, recycle, recovery and disposable options as well as greenhouse gases and their impact on climate change.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 2002

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

**CIVL 4012 Water Resource Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4012/>) **Legacy Code:** 300993

This subject introduces optimisation theories applicable to water resources projects. The subject applies different optimisation models to select the best option available. Engineering economic theories specifically applicable to water resources projects are also discussed.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 3011

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

**CIVL 4015 Complex Building Project (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4015/>) **Legacy Code:** 301232

This subject enables students to integrate and develop knowledge gained earlier in the course allowing them to simulate industry practice. Students are given a brief to undertake large and complex construction projects (eg. high rise buildings, airport construction, or sports stadium construction). They then take account of regulatory control, financial limitations, and stakeholder impacts whilst managing a team and being flexible and responsive to changing demands.

**Level:** Undergraduate Level 4 subject

**Co-requisite(s):** BLDG 4012

**Equivalent Subjects:** LGYB 5402 Building in Practice 3

CIVL 4005 Construction in Practice 3

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

**CIVL 4016 Envelope and Services (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4016/>) **Legacy Code:** 301222

The building envelope and its inter-relationship with building services are critical to the successful functioning of our modern built environment. In this subject students will learn how to minimise operational energy requirements by making good choices in terms of materials and systems which focus on end-user needs. Measurement of building performance and continuous improvement is addressed alongside compliance with building codes and relevant Australian standards.

**Level:** Undergraduate Level 4 subject

**Equivalent Subjects:** CIVL 4003 Construction Technology 5 (Envelope)

CIVL 4004 Construction Technology 6 (Services)

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

**CIVL 4017 Surface Water Hydrology (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4017/>) **Legacy Code:** 301329

Surface water hydrology covers the principles of hydrology as it pertains to surface water component of the hydrologic cycle. The principal focus is on the relationship between rainfall and surface runoff. The extent of flooding resulting from storm events will be evaluated through floodplain delineation process. Successful completion of this subject provides the competencies required to propose sustainable engineering solutions to potential adverse impacts of land-use changes. This subject builds on the hydraulic concepts acquired from the subjects completed earlier.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** CIVL 3011

**Equivalent Subjects:** CIVL 4007 - Hydrology EART 4001 - Surface Water Hydrology

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

**CIVL 4018 Building Design Project 1 (Honours) (20 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4018/>) **Legacy Code:** 301101

In this subject, students who have a record of superior performance in the Building Design Management program, will source a suitable design project at their own initiative, to complete as a capstone work which illustrates the skills they have developed throughout their study program. The project will contain a high level of complexity exceeding that of previous building designs produced in the program. Both the complexity level and the number of design constraints will distinguish the project undertaken for this subject from the non-honours stream subject. Diverse stakeholder input on the project's impact will be gathered and assessed. The design solution generated will show mastery of complex design problems which integrate technical knowledge with economic and social responsibility. Superior skill in resolving design conflicts will be demonstrated.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** BLDG 3001

**Incompatible Subjects:** BLDG 4001 Building Design Project 1

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

**CIVL 4020 Construction Research Project (20 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4020/>) **Legacy Code:** 301223

In this subject, students will undertake practical research into identified technical, managerial or economic problems in the construction industry. Students are required to undertake these industry-based research projects and produce an individual final report plus a 15 minute presentation.

**Level:** Undergraduate Level 4 subject

**Pre-requisite(s):** BLDG 4010

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

**CIVL 4021 Sustainable Waste Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil4021/>)

This subject explores the application of circular economy and zero waste principles alongside real-world case studies to focus on sustainable management of waste. Through a real-world design challenge students will apply learning to propose sustainable solutions that incorporate minimisation, recycling, recovery and disposable options. The skills and knowledge acquired in this subject can be applied to many career pathways including Engineering, Built Environment, and Science related disciplines.

**Level:** Undergraduate Level 4 subject

**Equivalent Subjects:** CIVL 4011

CIVL 3020

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

**CIVL 5001 Building Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil5001/>)

This subject provides students with an understanding of the factors that contribute to decisions in building design, particularly compliance with the National Construction Code and related standards. Students apply their learning to real world contexts as they integrate the construction codes, standards and engineering structural principles to building engineering. Students build their skillset to assess the structural performance acceptability of buildings.

**Level:** Postgraduate Coursework Level 5 subject

**Equivalent Subjects:** CIVL 7011 - Building Engineering

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

**CIVL 7001 Advanced Applied Mechanics (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7001/>) **Legacy Code:** 301010

Applied mechanics deals with the mechanical responses of structural components under various loading and support conditions. This subject will introduce the theory of elasticity and study the bending, buckling and vibration behaviours of beams, plates and shells and their associated applications in engineering practices.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7002 Advanced Composite Structures (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7002/>) **Legacy Code:** 301008

This subject enables students to gain an in-depth knowledge into composite structures based on Australian Standards and International Standards. Recent advances in the design of composite beams, slabs, columns and connections will be introduced.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7003 Advanced Geotechnical Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7003/>) **Legacy Code:** 300604

This subject will provide an overview of soil mechanics concepts required for the solution of practical geotechnical engineering problems. Students will be taught soil and foundation analysis including design techniques. The topics will cover shallow foundations, pile foundations, the stability of earth retaining structures, excavations, soft soils, groundwater flow and stability of slopes. Practical engineering cases will be emphasized.

**Level:** Postgraduate Coursework Level 7 subject

**Equivalent Subjects:** LGYA 6113 - Foundation Engineering (PG)

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

**CIVL 7004 Advanced Highway Infrastructure (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7004/>) **Legacy Code:** 301011

This subject teaches pavement and ground engineering design as part of highway construction. Students will develop advanced knowledge and skills in designing pavement structures and ground improvement techniques dealing with soft and weak grounds related to the construction of highway pavements and embankments. Students will apply their knowledge and skills in accordance with Australian standards and practices. The knowledge and skills developed in this subject will provide students with opportunities in careers such as in ground engineering including those involving design, construction and maintenance of highway infrastructures.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7005 Advanced Numerical Methods in Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7005/>) **Legacy Code:** 301024

The finite element method is an essential tool for the analysis and design of machine parts and civil engineering structures. The objective of this subject is to introduce the principles of finite element method and the applications of one, two and three dimensional elements in solving various engineering problems.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7006 Advanced Structural Analysis (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7006/>) **Legacy Code:** 300594

This subject will introduce students at postgraduate level to structural analysis of trusses, beams, frames and plates. It covers the slope deflection method and matrix method for analysis of beams, trusses and frames, and the bending and buckling analysis of beams and plates under various loading conditions. The theories learned in classes will be reinforced in practical sessions by using computer software packages.

**Level:** Postgraduate Coursework Level 7 subject

**Incompatible Subjects:** LGYA 5845 - Linear and Nonlinear Analysis of Structures LGYA 5976 - Advanced Structural Engineering LGYA 5837 - Numerical and Finite Element Methods

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

**CIVL 7007 Advanced Timber Structures (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7007/>) **Legacy Code:** 301009

This subject enables students to gain an in-depth knowledge into timber structures based on Australian Standards. Design of timber beams, floors, columns and connections will be introduced with a focus on the use of plywood, round timbers, glue-laminated timber and structural laminated veneer lumber.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7008 Advanced Waste Management (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7008/>) **Legacy Code:** 301017

This subject covers sources, identification and characterisation of solid and hazardous waste generated from the community. Sustainable management of waste incorporating minimisation, recycle, recovery and disposable options is discussed. Also, atmospheric pollutants and their control, greenhouse gases and their impact on climate change are examined.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7009 Advanced Water Engineering (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7009/>) **Legacy Code:** 300595

This subject introduces advanced principles of engineering hydrology as it pertains to the surface water component of the hydrologic cycle. Students are exposed to floodplain analysis techniques focusing on practical engineering solutions to issues originating from catchment development. Students are exposed to commonly used hydraulic and hydrologic software packages to delineate flooded areas resulting from such developments. Careers incorporating engineering hydrology are in demand across government, NGO and industrial sectors.

**Level:** Postgraduate Coursework Level 7 subject

**Incompatible Subjects:** CIVL 4007 Hydrology EART 4001 Surface Water Hydrology

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

**CIVL 7012 Building Fire Services (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7012/>) **Legacy Code:** 300711

This subject describes the various types and application of building services and fire safety systems. It introduces appropriate standards for building fire service system design and the methods of applying recommendations of fire engineering assessments with respect to building services and fire safety systems.

**Level:** Postgraduate Coursework Level 7 subject

**Equivalent Subjects:** LGYC 0661 - Building Fire Services

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

**CIVL 7013 Deep Foundations (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7013/>) **Legacy Code:** 301015

This subject covers advanced analysis and design criteria for deep foundations. Both statically and dynamically loaded deep foundations are covered including the site investigation methods and field testing methods adopted in practice for determining integrity and load carrying capacity. Appropriate computer software will be introduced to carry out the deep foundation design according to the Australian Standards.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7014 Sustainable Systems (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7014/>) **Legacy Code:** 301003

This subject teaches students the essential tools available to achieve environmental sustainability in various engineering/construction/industrial design professional settings. The focus of the subject is on the selection and application of methods and processes to achieve sustainable development goals (SDGs) in Australian and global context. The skills gained in this subject will help the student to work in professions such as an environmental engineer, an environmental manager, a sustainability advisor or a sustainability engineer.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7015 Water Resources Systems Analysis (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7015/>) **Legacy Code:** 301012

Water resources projects are large infrastructure projects requiring huge capital expenditure. In addition, multiple options are usually available to meet the project goals but at different costs and under varying constraints. This subject presents the application of optimisation techniques to select the best project from a list of competing projects. Applications of these techniques to optimally allocate available water resources are discussed. These are presented within the context of maximising the return of investment.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7017 Wastewater Treatment and Recycling (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7017/>) **Legacy Code:** 301278

This subject teaches students the fundamental science and hydraulic engineering principles necessary to design, operate and troubleshoot wastewater systems consisting of collection, treatment and recycling and resource recovery. Students will be exposed to emerging wastewater treatment processes and its applications through research and practical work.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 7018 Water Treatment and Distribution (10 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil7018/>) **Legacy Code:** 301279

This subject focuses on the design of conventional and emerging water treatment unit processes using fundamental science and hydraulic engineering principles. The emphasis is on practical design and water quality management in the distribution system. Students will be exposed to emerging water treatment processes and its applications through research and practical work.

**Level:** Postgraduate Coursework Level 7 subject

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

**CIVL 9001 Higher Degree Research Thesis - Engineering (Civil) (80 Credit Points)**

**Subject Details** (<https://hbook.westernsydney.edu.au/subject-details/civil9001/>) **Legacy Code:** 800059

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

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