OTHER ENGR. AND RELATED TECH (ENGR)

ENGR 0001 Academic Skills for Engineering (WSTC Prep) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr0001/) Legacy Code: 700202
This subject is designed to assist students to become successful independent reflective learners. It introduces students to a range of theories and concepts to facilitate the development of practical skills and personal attitudes necessary for success in tertiary study. Emphasis is placed on developing the key competencies of scientific inquiry - collecting, analysing, organising and communicating information as well as solving problems, particularly when related to using mathematical ideas and techniques.
Level: Undergraduate Level 0 Preparatory subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 0002 Computing, Engineering and Mathematics Exchange Unit 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr0002/) Legacy Code: 900626
Level: Undergraduate Level 0 Preparatory subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 0003 Computing, Engineering and Mathematics Exchange Unit 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr0003/) Legacy Code: 900627
Level: Undergraduate Level 0 Preparatory subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 0004 Computing, Engineering and Mathematics Exchange Unit 3 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr0004/) Legacy Code: 900628
Level: Undergraduate Level 0 Preparatory subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 0005 Computing, Engineering and Mathematics Exchange Unit 4 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr0005/) Legacy Code: 900629
Level: Undergraduate Level 0 Preparatory subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 0006 Computing, Engineering and Mathematics Exchange Unit 5 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr0006/) Legacy Code: 900630
Level: Undergraduate Level 0 Preparatory subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1006 Design Studio 2: Form and Production (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1006/) Legacy Code: 301075
From Spring 2020, this subject will be replaced by301286 - Designing for People: Applied Ergonomics. This subject equips students with the skills to use creative design and structured decision making to solve challenging problems. Students will develop their understanding of design process by creating experimental models using various methods, including 3D rapid prototyping. Students will also record their design process via multimodal media, in both digital and non-digital format. They will also reflect upon the design process through the CDIO framework (Conceive, Design, Implement, Operate) and CAD (Computer-Aided Design).
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1017 - Form and Production ENGR 1014 - Engineering and Design Concepts
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1008 Engineering Materials (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1008/) Legacy Code: 300965
This subject will introduce fundamentals of engineering materials. The topics will include materials structure, properties, processing and applications, degradation of materials, sustainability, and the selection of materials for various engineering applications.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1014 - Engineering Design Concepts (EDC) ENGR 1034 - Engineering and Design Concepts (UWSC) LGYB 0481 - Engineering and Design Concepts (UWSC Assoc Deg) ENGR 1009 - Engineering Materials (WSTC Assoc Deg) ENGR 1010 - Engineering Materials (WSTC)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1009 Engineering Materials (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1009/) Legacy Code: 700147
This subject will introduce fundamentals of engineering materials. The topics will include materials structure, properties, processing and applications, degradation of materials, sustainability and the selection of materials for various engineering applications.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1014 - Engineering and Design Concepts ENGR 1034 - Engineering and Design Concepts (UWSC) LGYB 0481 - Engineering and Design Concepts (UWSC Assoc Deg) ENGR 1008 - Engineering Materials ENGR 1010 - Engineering Materials (WSTC)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1010 Engineering Materials (WSTC) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1010/) Legacy Code: 700152
This subject will introduce fundamentals of engineering materials. The topics will include materials structure, properties, processing and applications, degradation of materials, sustainability and the selection of materials for various engineering applications.
Level: Undergraduate Level 1 subject
Pre-requisite(s): Students enrolled in 6033 Diploma in EngineeringBachelor of Engineering Studies or 7034 Diploma in Engineering or 7066 Diploma in Engineering Extended must pass MATH 0008 Mathematics 2 before enrolling in this unit
Equivalent Subjects: ENGR 1014 - Engineering and Design Concepts ENGR 1008 - Engineering Materials ENGR 1034 - Engineering and Design Concepts (UWSC) LGYB 0481 - Engineering and Design Concepts (UWSC Assoc Deg) ENGR 1009 - Engineering Materials (WSTC Assoc Deg)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1011 Engineering Physics (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1011/) Legacy Code: 300963
This subject serves as an introduction to the fundamentals of engineering physics with appropriate applications in a wide range of engineering and industrial design systems.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1028 - Physics and Materials ENGR 1035 - Physics and Materials (UWSC) LGYB 0486 - Physics and Materials (UWSC Assoc Deg) ENGR 1013 - Engineering Physics (WSTC) ENGR 1012 - Engineering Physics (WSTC AssocD)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1012 Engineering Physics (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1012/) Legacy Code: 700153
This subject serves as an introduction to the fundamentals of engineering physics with appropriate applications in a wide range of engineering and industrial design systems. Students will be expected to solve problems by applying the laws and principles of engineering physics in the following areas covered by the subject - units and vectors, linear and circular motion, photons, electrons and atoms, force systems and equilibrium, work and energy applications, dynamics of rotational motion, fluid dynamics, heat and thermodynamics, periodic motion and wave phenomena, electricity and magnetism.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1011 - Engineering Physics ENGR 1013 - Engineering Physics (WSTC)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1013 Engineering Physics (WSTC) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1013/) Legacy Code: 700151
This subject serves as an introduction to the fundamentals of engineering physics with appropriate applications in a wide range of engineering and industrial design systems.
Level: Undergraduate Level 1 subject
Co-requisite(s): MATH 0008 - Mathematics 2 (WSTC Prep)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1018 Fundamentals of Mechanics (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1018/) Legacy Code: 300463
In this subject students acquire knowledge about the action and interaction of forces, moments and couples in two and three dimensions. Students then apply this to the analysis of the equilibrium of single bodies, and of trusses, mechanisms, and transversely loaded beams. In addition, students study the dynamics of a non-rotating body, and a body rotating about a fixed axis. Further, they study the friction between bodies. Students conduct experiments to see how the lecture content applies to the real world, and make extensive use of vector algebra.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1020 Fundamentals of Mechanics (WSTC) ENGR 1019 Fundamentals of Mechanics (WSTC Assoc Deg)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1019 Fundamentals of Mechanics (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1019/) Legacy Code: 700113
This subject deals with the action and interaction of forces, moments and couples in two and three dimensions. It examines the equilibrium of single bodies, and of trusses and mechanisms. It then looks at the friction between bodies. It covers the dynamics of a non-rotating body, and a body rotating about a fixed axis. Finally, internal loadings are investigated - particularly within a transversely loaded beam. The subject makes extensive use of vector algebra.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1020 - Fundamentals of Mechanics (WSTC) ENGR 1018 - Fundamentals of Mechanics
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1020 Fundamentals of Mechanics (WSTC) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1020/) Legacy Code: 700023
This subject deals with the action and interaction of forces, moments and couples in two and three dimensions, on machine elements and simple structures. It examines the equilibrium of single bodies, of multi-body structures and of mechanisms. It then covers the dynamics of a particle. A systematic approach to solving practical engineering design problems is provided. The subject makes extensive use of vector algebra.
Level: Undergraduate Level 1 subject
Pre-requisite(s): Students enrolled in 7034 Diploma in Engineering 7066 Diploma in Engineering Extended or 6033 Diploma in EngineeringBachelor of Engineering Studies must pass PHYS 0003 Foundation Physics 2 before enrolling in this unit
Equivalent Subjects: ENGR 1018 - Fundamentals of Mechanics ENGR 1019 - Fundamentals of Mechanics (WSTC Assoc Degree)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1023 Introduction to Engineering Business Management (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1023/) Legacy Code: 700114
This subject will cover aspects of modern engineering business management. This subject of study will provide students an opportunity to look at small, medium and large Engineering businesses and the role of Engineering Associates in those organisations.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1024 Introduction to Engineering Practice (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1024/) Legacy Code: 300964
This subject encourages students to explore the professional responsibilities and challenges faced by Engineers. Students are introduced to emerging issues and approaches in the engineering profession, with particular attention given to using a systems approach to solve engineering problems. Students engage in a semester-long research and problem solving task that addresses technical, environmental and social sustainability imperatives and fosters fundamental research and communication skills. Special emphasis is placed on lifelong learning, academic literacy and professional skills including information literacy, project management, engineering drawing and teamwork which equip students for subsequent academic and professional pursuits.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1015 Engineering and Industrial Design Practice LGYA 5705 Introduction to Professional Practice ENGR 1016 Engineering Design and Construction Practice ENGR 1033 Engineering Design and Construction Practice LGYB 0482 Engineering Design and Construction Practice ENGR 1026 Introduction to Engineering Practice and ENGR 1025 Introduction to Engineering Practice
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1025 Introduction to Engineering Practice (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1025/) Legacy Code: 700149
This subject encourages students to explore the professional responsibilities and challenges faced by Engineers. Students are introduced to emerging issues and approaches in engineering profession, especially particular attention will be given to systems approach. Students engage in a term-long research and problem solving task that addresses technical, environmental and social sustainability imperatives and fosters fundamental research, communication skills. Special emphasis is placed on lifelong learning, academic literacy and professional skills including information literacy, project management, engineering drawing and teamwork which equip students for subsequent academic and professional contexts.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1016 Engineering Design and Construction Practice ENGR 1024 Introduction to Engineering Practice ENGR 1033 Engineering Design and Construction Practice LGYB 0482 Engineering Design and Construction Practice ENGR 1026 Introduction to Engineering Practice
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1026 Introduction to Engineering Practice (WSTC) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1026/) Legacy Code: 700148
This subject encourages students to explore the professional responsibilities and challenges faced by Engineers. Students are introduced to emerging issues and approaches in engineering profession, especially particular attention will be given to systems approach. Students engage in a term-long research and problem solving task that addresses technical, environmental and social sustainability imperatives and fosters fundamental research, communication skills. Special emphasis is placed on lifelong learning, academic literacy and professional skills including information literacy, project management, engineering drawing and teamwork which equip students for subsequent academic and professional contexts.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1016 Engineering Design and Construction Practice ENGR 1024 Introduction to Engineering Practice ENGR 1033 Engineering Design and Construction Practice LGYB 0482 Engineering Design and Construction Practice ENGR 1025 Introduction to Engineering Practice
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1036 Construction Communication (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1036/) Legacy Code: 301213
This subject encourages students to explore professional responsibilities and challenges faced by construction professionals. Students are introduced to the construction profession through the use of industry case studies and project problems. Students engage in a research and problem-solving task that addresses sustainability imperatives and fosters fundamental research and communication skills. Special emphasis is placed on academic and business literacy, project management and teamwork which equip students for subsequent academic and professional contexts.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1016 - Engineering Design Construction Practice ENGR 1029 - Professional Competencies ENGR 1033 - Engineering Design and Construction Practice (UWSC) LGYB 0482 - Engineering Design and Construction Practice (UWSC Assoc Deg) ENGR 1030 - Professional Competencies
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1037 Construction Communication (WSTC) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1037/) Legacy Code: 700290
This subject encourages students to explore professional responsibilities and challenges faced by construction professionals. Students are introduced to the construction management profession through the use of industry case studies and project problems. Students engage in a research and problem-solving task that addresses sustainability imperatives and fosters fundamental research and communication skills. Special emphasis is placed on academic and business literacy, project management and teamwork which equip students for subsequent academic and professional contexts.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1016 Engineering Design Construction Practice
ENGR 1029 Professional Competencies
ENGR 1033 Engineering Design Construction Practice (WSTC) LGYB 0482 Engineering Design Construction Practice (Assoc Deg)
ENGR 1036 Construction Communication and
ENGR 1030 Professional Competencies (WSTC)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1038 Design Graphics: Presenting Innovation (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1038/) Legacy Code: 301283
Design visualisation in the form of 2D and 3D graphics is fundamental to the overall design process. This subject provides students with essential knowledge of design principles as used in visual communication. Students will employ graphic techniques to effectively convey a design proposal using creativity, technical skill, and quality design principles in a manner that is consistent with industry expectations. Students will produce graphic work that is portfolio-ready and suitable to display to potential clients and employers.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1022 Industrial Graphics 1 Presentation ENGR 1021 Graphics 1 2D 3D Industrial Design Communication
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1039 Designing for Circular Economy (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1039/) Legacy Code: 301281
Traditional linear consumption patterns have placed considerable load on available natural resources. The lack of comprehensive mitigation strategies has motivated local and international efforts around the United Nations Sustainable Development Goals (UNSDGs 2030) to finding resolutions towards making the world more equitable, sustainable, liveable and with opportunities for new sustainable businesses. Students will choose an existing product and apply the principles of the UNSDGs and Circular Economy to create a proposal and prototype to improve upon its current design. Throughout this process the students will consider product usage, durability, bio-ingredients, the product lifecycle, community impact, and sustainability.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1004 Design Science (WSTC)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1040 Designing for People: Applied Ergonomics (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1040/) Legacy Code: 301286
Ergonomics is the study of the interaction between people, their environments, and their objects. A sound understanding of the principles of ergonomics allows a designer to develop products, systems and environments with optimum product usability and end user safety. In this unit, students are introduced to modelling workshop procedures and undertake their own ergonomic study. Students then build and test a hand-held scale product, and integrate user feedback into their redesign.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1041 Designing for User Experience (UX) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1041/) Legacy Code: 301284
Understanding product-oriented user requirements and mapping user experience journeys provide rich inputs for new product and service innovations. In this subject students will focus on user needs and the interactive elements which, when combined, create successful user experiences through impactful user interfaces, and highly differentiated outcomes. Students will engage in an applied project in response to an interaction design challenge. As part of their project students will incorporate elements to evoke strong emotional, sensorial and functional connections which are essential in creating inclusive design, engaged usability, and high-quality human-centred experiences, for successful products and services.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1042 Sustainable Materials and Smart Manufacturing (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1042/) Legacy Code: 301288
In this subject we explore the circular 'Cradle to Cradle' design philosophy through material choice and manufacturing systems. Introduced are conventional materials, smart materials, and manufacturing systems within an ecological assessment framework, equipping designers with the tools to select and assess materials and manufacturing processes appropriate to use. Students undertake a life cycle materials research project and a design for manufacture (DFM) project in the context of emergent Industry 4.0 principles.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1032 Sustainable Design Materials Technology ENGR 1031 Sustainable Design 1 Materials Technology
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1043 Co-Designing Change with Local Communities (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1043/) Legacy Code: 301282
Collaboration is the foundation for some of the most successful world achievements ranging from medical breakthroughs, to space travel, to smart phones, to drones. Effective collaboration in diverse teams promotes a dynamic environment for creativity and innovation with good prospects for developing novel solutions. In a real world collaborative, co-design partnership with an external university partner, students will create a design proposal and prototype, based on a project brief. Through this collaborative process, students will develop skills in research, conceptualisation, communication and reflective practice whilst prototyping and testing their ideas before presenting them to their client.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1002 Applied Erognomics ENGR 1005 Design Studio 1 Patterns and Products
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1044 Drawing Skills for Design Thinking (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1044/) Legacy Code: 301285
Drawing skills can unlock and translate creative thoughts as actions, iterations, and guide collaborative dialogue in meeting common goals. In combination with Design Thinking essentials which include empathy, ideation, and experimentation, practiced drawing skills can accelerate decision-making for individuals or groups. This subject is focused on developing hand drawing skills as a tool for generating creative ideas and design solutions. Students will attain an understanding of spatial relationships between humans and objects, and natural and built environments. The emphasis is on using drawing as a method for conducting exploratory investigations, recording creative thinking processes through ideation and inspiring innovation. Students will gain confidence in communicating their creative ideas to a wide audience.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1045 Engineering Programming Fundamentals (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1045/) Legacy Code: 301335
An introduction to problem-solving via programming, which aims to have students develop proficiency in using a high level programming language. Topics covered in this subject include: algorithms, program structures (statements, sequence, selection, iteration, functions), data types (numeric, character), data structures (arrays, tuples, pointers, lists), storage structures (memory, addresses), introduction to analysis of algorithms, testing, code quality, teamwork, and reflective practice. The subject includes extensive practical work in labs and programming projects.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1046 Human Centred Design Research Methods (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1046/) Legacy Code: 301280
This subject introduces Human-Centred Design (HCD) to students as an interactive practice that puts people's views, behaviour, and their environment at the centre of problem-solving, design and innovation processes. Students will work on an applied research project that allows them to observe, experiment, gain feedback from participants, and think critically through co-designing to propose new interpretations and solutions for our changing built environment, design artefacts and social habits. In alignment with the United Nations Sustainability Development Goals (UNSDG), this subject's research methods cover professional skills on ethics, academic literacy, design and research iteration processes, interdisciplinary team approaches, and sustainability. Students will be presented with opportunities to interact with industry and community experts to enhance their understandings and make potential career connections.
Level: Undergraduate Level 1 subject
Equivalent Subjects: LGYA 5705 - Introduction to Professional Practice ENGR 1015 - Engineering Industrial Design Practice ENGR 1016 - Engineering Design Construction Practice ENGR 1033 - Engineering Design Construction Practice LGYB 0482 - Engineering Design Construction Practice ENGR 1027 - Introduction to Industrial Design methods
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1047 Advanced Engineering Physics 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1047/) Legacy Code: 301334
This subject will be offered at Engineering Innovation Hub - Hassall St, Parramatta campus. The aim of this subject is to introduce students to the conceptual, mathematical and practical aspects of the following topics in advanced engineering physics, viz: vectors, linear and circular motion, photons, electrons and atoms, Newtons laws of motion, work and kinetic energy, dynamics of rotational motion, fluid dynamics, thermodynamics, periodic motion and waves/acoustics. The content will be delivered via a combination of lectures, tutorials and hands-on practicals in order to develop the growth of theoretical and applied engineering physics knowledge. This will provide students with a solid foundation for their engineering studies.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1011 - Engineering Physics
ENGR 1013 - Engineering Physics
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1048 Engineering Materials (UG Cert) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1048/) Legacy Code: 500066
This subject will introduce fundamentals of engineering materials. The topics will include materials structure, properties, processing and applications, degradation of materials, sustainability and the selection of materials for various engineering applications.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1008 Engineering Materials ENGR 1014 Engineering and Design Concepts ENGR 1009 Engineering Materials (WSTC AssocD) ENGR 1010 Engineering Materials (WSTC) ENGR 1034 Engineering and Design Concepts (WSTC) LGYB 0481 Engineering and Design Concepts (WSTC AssocD)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1049 Introduction to Engineering Practice (Block) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1049/) Legacy Code: 500063
This subject encourages students to explore the professional responsibilities and challenges faced by Engineers. Students are introduced to emerging issues and approaches in engineering profession, especially particular attention will be given to systems approach. Students engage in a term-long research and problem solving task that addresses technical, environmental and social sustainability imperatives and fosters fundamental research, communication skills. Special emphasis is placed on lifelong learning, academic literacy and professional skills including information literacy, project management, engineering drawing and teamwork which equip students for subsequent academic and professional contexts.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1024 Introduction to Engineering Practice ENGR 1025 Introduction to Engineering Practice (WSTC) ENGR 1026 Introduction to Engineering Practice (UWSC)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1050 Sustainable Engineering Fundamentals (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1050/) Legacy Code: 301418
Engineers need to ensure that their practice is guided by sustainability principles. This subject will introduce students to sustainability and provide an understanding of the environmental and social impacts of human development. Students will be introduced to various national and international initiatives including the United Nations Sustainable Development Goals. Students will learn fundamental scientific concepts in chemistry and ecology, and conduct and report on laboratory experiments relevant for emerging issues. Students will apply concepts such as material and energy flow, limiting nutrients, carrying capacity, climax, biodiversity, food chain and irreversibility in relation to how an ecosystem responds to changes in the environment to real world case studies.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1051 Engineering Physics (Block) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1051/)
This subject serves as an introduction to the fundamentals of engineering physics with appropriate applications in a wide range of engineering and industrial design systems. Students will be expected to solve problems by applying the laws and principles of engineering physics in the following areas covered by the Subject – units and vectors, linear and circular motion, photons, electrons and atoms, force systems and equilibrium, work and energy applications, dynamics of rotational motion, fluid dynamics, heat and thermodynamics, periodic motion and wave phenomena, electricity and magnetism.
Level: Undergraduate Level 1 subject
Equivalent Subjects: ENGR 1011 (300963) Engineering Physics
ENGR 1013 (700151) Engineering Physics (WSTC)
ENGR 1028 (300464) Physics and Materials
ENGR 1035 (700020) Physics and Materials (WSTC)
700117 Physics and Materials (WSTC Assoc Deg)
ENGR 1012 (700153) Engineering Physics (WSTC AssocD)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1052 Fundamentals of Mechanics (Block) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1052/)
In this subject students acquire knowledge about the action and interaction of forces, moments and couples in two and three dimensions. Students then apply this to the analysis of the equilibrium of single bodies, and of trusses, mechanisms, and transversely loaded beams. In addition, students study the dynamics of a non-rotating body, and a body rotating about a fixed axis. Further, they study the friction between bodies. Students conduct experiments to see how the lecture content applies to the real world, and make extensive use of vector algebra.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 1053 Applied Physics for Engineers (WSTC) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr1053/)
This subject provides you with an introduction to the fundamentals of engineering physics, tailored for relevance in various engineering contexts. You will master the use of System Internationale (SI) units and engage deeply with core principles spanning from mechanics and thermodynamics to electricity and magnetism. This subject not only equips you with an understanding of the theoretical knowledge of engineering physics, but also places a strong emphasis on the practical application through a series of experiments. You will hone your skills in planning, conducting, and documenting experiments, allowing you to draw meaningful connections between theoretical principles and experimental results.
Level: Undergraduate Level 1 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2001 Automated Manufacturing (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2001/) Legacy Code: 300735
Automated manufacturing is about increasing the capacity of productivity through a range of integrated technologies, such as digital transformation platforms so that manufacturing operations can run simultaneously. These processes are used in industrial settings. Students will be introduced to the fundamentals of manufacturing operations, automation, and control technologies, including numerical control and industrial robotics. This subject aims to deepen the understanding of the material selection process and enables students to identify appropriate manufacturing processes in a product manufacturing design. Various manufacturing processes such as material removal, bulk deformation, sheet-metal forming, and non-traditional processes will be examined. Through problem-solving activities, students will enhance their manufacturing engineering skills in the computer-aided design (CAD) and computer-aided manufacturing (CAM) areas and acquire the skills to machine their CAD models on a computer numerical control (CNC) machine.
Level: Undergraduate Level 2 subject
Pre-requisite(s): Students must have passed the two subjects MATH 1016 Mathematics for Engineers 1 and ENGR 1018 Fundamentals of Mechanics OR must have passed the two subjects MATH 1034 Mathematics for Engineers 1 (Advanced) and ENGR 1018 Fundamentals of Mechanics before they can enroll in this subject
Equivalent Subjects: ENGR 3002 - Automated Manufacturing
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2009 Engineering Management for Engineer Associates (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2009/) Legacy Code: 700109
The subject will provide the knowledge and skills to enable students to support the achievement of organisational goals through applying knowledge of environment and internal culture. The subject evaluates planning processes and goal setting to achieve superior performance and compares alternative approaches to motivation of work team members. Students will consider types of managerial communications and their associated communications channels in achieving best professional practice.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2010 Engineering Project (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2010/) Legacy Code: 700110
In this unit, students will use project management tools, techniques and practices to plan and control a project that achieves stated requirements on time and within budget. Students will plan a project including the creation of a statement of work, a work breakdown structure and an appropriate set of supporting work packages.
Level: Undergraduate Level 2 subject
Pre-requisite(s): ENGR 2018 OR
ENGR 2031
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2011 Graphics 2: Visual Simulation (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2011/) Legacy Code: 301076
From 2020, this subject will be replaced by 301287 - Designing Graphics: Engineering Documentation. Three-dimensional digital simulations are used to model manufactured artefacts, create virtual environments and simulate dynamic processes or systems. In this subject students will use 3D modelling software to simulate static and dynamic 3D structures. High quality photorealistic rendering and 3D printing file preparation will also be covered.
Level: Undergraduate Level 2 subject
Equivalent Subjects: ENGR 2015 - Industrial Graphics 3 3D Solids
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2012 Graphics 3: 3D Engineering Specifications and Visualisation (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2012/) Legacy Code: 301079
From 2020, this subject will be replaced by 301290 - Design Graphics: Communication for Manufacture. This subject introduces formal graphical communication methods used by professionals engaged in the design, manufacture and management of manufactured items. Students will learn how to follow Australian Standards for engineering drawings, and to use Computer-Aided Design (CAD) software for accurately representing and modelling basic parts and assemblies. The documentation of design concepts in the form of three dimensional (3D) computer models provides data that can be applied in a wide variety of ways to facilitate the understanding and production of parts and assemblies. The objective of this subject is to introduce students to the industry standard software and hardware employed to generate these models, via a "hands on" approach to creating 3D data. Issues such as data transfer, rapid prototyping, computer numerical control (CNC) machining and visualisation will also be discussed.
Level: Undergraduate Level 2 subject
Pre-requisite(s): ENGR 2011 OR
ENGR 1024
Equivalent Subjects: ENGR 2014 Industrial Graphics 2 Transition
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2013 Graphics 4: Kinetic Narratives (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2013/) Legacy Code: 301091
From 2020, this subject will be replaced by 301308 - Design Practice: Sustainable Manufacturing. This subject introduces students to real life applications of graphics technology, such as 3D games, 3D virtual environments, immersive learning spaces, dynamic 3D simulations of ecosystems, artwork for public spaces, virtual agents. Students will use different software platforms to create interactive 3D environments. They will apply theories of human-computer interaction to design projects where they develop: "a dynamic simulation of a natural or artificial ecosystem", a dynamic 3D virtual environment in which users interact with agents.
Level: Undergraduate Level 2 subject
Pre-requisite(s): ENGR 2012
Equivalent Subjects: ENGR 3018 - Industrial Graphics 4 Surface
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2016 Pavement Materials and Design (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2016/) Legacy Code: 300984
This subject will provide students the basic knowledge and concepts on pavement materials and design. It will cover the common materials used in pavement construction such as aggregates, cement, asphalt, and concrete. It will also cover the pavement design system, pavement construction, design of flexible pavements, design of rigid pavements, and pavement maintenance.
Level: Undergraduate Level 2 subject
Pre-requisite(s): ENGR 1008 or PROC 1008
Equivalent Subjects: ENGR 1007 - Engineering Geology and Concrete Materials ENGR 2017 - Pavement Materials and Design
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2017 Pavement Materials and Design (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2017/) Legacy Code: 700239
This subject will provide students with the basic knowledge and concepts on pavement materials and design. It will cover the common materials used in pavement construction such as aggregates, cement, asphalt and concrete. It will also cover the pavement design system, pavement construction, design of flexible pavements, design of rigid pavements and pavement maintenance.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): ENGR 1009
Equivalent Subjects: ENGR 2016 - Pavement Materials and Design
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2018 Professional Practice for Engineer Associates (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2018/) Legacy Code: 700118
This subject will provide the knowledge and skills to enable students to support the achievement of organisational goals through applying knowledge of environment and internal culture. The subject evaluates planning processes and goal setting to achieve superior performance and compares alternative approaches to motivation of work team members. Students will consider types of managerial communications and their associated communications channels in achieving best professional practice.
Level: Undergraduate Level 2 subject
Pre-requisite(s): ENGR 2009
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2022 Design Practice: Sustainable Manufacturing (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2022/) Legacy Code: 301308
Reflecting upon the life cycle of products and their components is important in understanding how decisions at the design level impact on people, resources, sustainable goals and how these contribute towards sustainability-oriented local and global value chains. This subject focuses on sustainable decision-making at the design level. It challenges and motivates students towards using sustainability principles to promote good Design for Disassembly (DfD) practices with linkages to material durability, and material reuse. Through a project-based approach, students will appraise manufacturing considerations for product design applying in succession Design for Manufacturing, Assembly and Disassembly (DfM, DfA, DfD) principles to their products and reflect on product lifecycle management best practice.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2023 Advanced Engineering Physics 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2023/) Legacy Code: 301351
This subject will be offered at Engineering Innovation Hub - Hassall St, Parramatta campus. The aim of the subject is to introduce students to topics such as electricity, magnetism, induction and semiconductivity, and to equip them with mathematical approaches for solving problems in these areas. Content in this subject will be delivered via the combination of lectures, tutorials and practicals in order to foster in students the growth of theoretical and applied physics knowledge. Students completing this subject will have a solid foundation upon which to base their continued engineering studies.
Level: Undergraduate Level 2 subject
Pre-requisite(s): ENGR 1047
Co-requisite(s): MATH 1035
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2024 Design Graphics: Communication for Manufacture (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2024/) Legacy Code: 301290
Students will design manufacture ready product samples through the use of computer graphics including three-dimensional (3D) surfacing and solids modelling methods used by professionals engaged in engineering and industrial design practice. Students will produce two-dimensional (2D) and three-dimensional (3D) documentation, which can be widely applied to facilitate the understanding and production of parts and assemblies.
Level: Undergraduate Level 2 subject
Pre-requisite(s): ENGR 2025
Equivalent Subjects: ENGR 2014 Industrial Graphics 2 Transition
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2025 Design Graphics: Engineering Documentation (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2025/) Legacy Code: 301287
Current and future growth in the areas of product design, virtual reality, and high technology innovation industries require a foundation and working knowledge of 3D computer modelling. In this subject students will be introduced to 3D modelling software and the fundamental principles of current Australian Standards for engineering drawing and documentation. The skills gained will contribute to preparation for future complex projects in engineering, industrial design and creative industries that require prototyping, files for additive manufacturing (3D printing), and component designs that can perform at exact specifications and standards.
Level: Undergraduate Level 2 subject
Equivalent Subjects: ENGR 2011 - Graphics 2 Visual Simulation
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2026 Design Semantics: Exploring Product Form (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2026/) Legacy Code: 301289
Products can engage our senses to evoke an emotional response or mediate an experience. This is a powerful psychological tool for industrial designers to understand in terms of the design interface as it provides a strategic opportunity for innovation. In this subject students will create meaningful and active product relationships, and use product semantics as an agency for proposing design solutions in areas such as health and well-being, ageing populations, and sustainable design.
Level: Undergraduate Level 2 subject
Equivalent Subjects: ENGR 2006 - Design Studio 1 Themes and Variations ENGR 2008 - Design Studio 3 Design Process and Function
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2027 Engineering Design (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2027/) Legacy Code: 301341
This subject will be offered at Engineering Innovation Hub - Hassall St, Parramatta campus. Design thinking is a fundamental skill that every engineer must have for the 21st Century. It is one of the skills that profoundly distinguish human intelligence from artificial intelligence, which greatly impacts an engineer's long-term career success in the workplace. This subject aims to equip students with the domain-independent and solution-neutral design thinking, which can be applied to whatever technical stream students choose to pursue in the future.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2028 New Product Innovation with IoT Data (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2028/) Legacy Code: 301305
Design Thinking has had a considerable effect on the ways firms innovate, design and evaluate products and services for use. The evolution of smart products and services in recent years offers both challenges and rewards for organisations as the big data generated provides insights to current product and service utilisation. Interpretation and integration of these new knowledge streams can support future product development, by enhanced understanding of human behaviour and features of sensor technologies. Students will produce an IoT influenced project design brief that provides the directional basis for the deployment of both human and technological resources in preparation for their career progression as a future innovation manager in a global, online marketplace.
Level: Undergraduate Level 2 subject
Equivalent Subjects: ENGR 2003 - Design Management 1 Product Design Audit
ENGR 2002 - Design Management 1 Process and Manufacturing
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2029 Simulation in Virtual and Augmented Realities (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2029/) Legacy Code: 301306
Simulation in three-dimensional (3D) environments provide valuable insights to human-centred perspectives. Whilst investigating the fundamentals of Virtual Reality (VR) and Augmented Reality (AR), students will analyse aspects of functionality, user interfaces, spatial relationships in built environments, sustainability, efficient resource management, instructional support for safety and training, and accelerated design conceptualisation in detailed new product, service or environmental innovation. Students' experiences will equip them for future employment as VR and AR experience designers, interactive experience producers, or creative technologists.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2030 Industrial Experience (Associate Engineer) (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2030/) Legacy Code: 700311
Industry experience provides a significant opportunity for students to understand employer expectations in relation to working on projects and with others in a professional capacity. Students undertake six weeks full-time (37.5 hours per week) employment (or part time equivalent) to obtain relevant workplace experience in Engineering under the supervision of professional engineers in one or more companies. Students identify learning opportunities and goals with a focus on applying academic learning in practice, learning project management, work culture, professional attitude and self-awareness. Students develop critical reflective skills in reporting their progress.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2031 Management Practices for Engineer Associates (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2031/) Legacy Code: 700307
This subject will enable students to support the achievement of organisational goals. The unit's major focus is project management, culminating in a practical project which gives students the opportunity to work as part of a team to apply key project management skills and knowledge. It also introduces some of the management practices engineers need to understand and master in order to work effectively in the field. This includes effective communication, especially when working in a team, work health and safety, and an ability to plan, develop and build a career as an Engineer Associate.
Level: Undergraduate Level 2 subject
Equivalent Subjects: ENGR 2009 Engineering Management for Engineer Associates (WSTC AssocD)
ENGR 2018 Professional Practice for Engineer Associates (WSTC AssocD)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2032 Sustainability Analysis and Design (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2032/) Legacy Code: 301419
In this unit, students will learn and appropriately apply technical and socio-economic approaches of achieving sustainability, such as life cycle assessment, environmental impact assessment, environmental auditing, circular economy, design for the environment and cleaner production to real world problems. The students will be taught about policy, financial and social approaches to achieving sustainability through real life problems/cases.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2033 Industrial Experience (Engineering Technologist) (0 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2033/) Legacy Code: 301441
Industry experience is a significant opportunity for students to understand employer expectations in relation to working on projects and with others in a professional capacity. Students undertake 8 weeks full-time (37.5 hours per week) employment (or equivalent) to obtain relevant workplace experience in Engineering under the supervision of professional engineers or engineering technologists in one or more companies. Students identify learning opportunities and goals with a focus on applying academic learning in practice, learning project management, work culture, professional attitude and self-awareness. Students develop critical reflective skills in reporting their progress.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2034 Geometric Design of Roads (WSTC AssocD) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2034/)
This is an introductory subject covering the design of dimensions and configurations of the visible features of a roadway. It will provide students with an understanding of pavement widths, horizontal and vertical alignment, slopes channelization, intersections and other features that can significantly affect the operations, safety, and capacity of the roadway network. This subject is designed in collaboration with Transport for NSW.
Level: Undergraduate Level 2 subject
Pre-requisite(s): MATH1010 Fundamentals for Engineering Studies
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2035 Modern Digital Design and Development (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2035/)
This subject provides fundamental knowledge and skills development in Digital Manufacturing and Design (DMD) technologies for Advanced Manufacturing, Product Design and Industry 4.0. Digital transformation happens throughout the world in Product Development and Design (PDD). Students will engage with digital technologies which stimulate innovative, integrated and sustainable product development processes and workflows from design to manufacturing. As part of their engagement with real-world design projects, students will apply their skills to areas such as design, scenario analysis, rapid prototyping and testing for improved manufacturing outcomes. A number of opportunities, such as the WSU Formula SAE Race Car project, will allow students to work alongside industry partners and develop job ready practices for their future careers.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 2036 Professional Development in Teams-based Projects (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr2036/)
Voluntary student-led projects provide many benefits to students including improved on-campus experience and the expansion of peer, academic and professional networks alongside extra-curricular opportunities for skills development. Students working on these projects will develop their professional skills to match the expectations of partners, stakeholders, and team-mates who they are working alongside. This subject will support the development of professional skills among students who have demonstrated a significant commitment to a recognised student-led project which will contribute to their career development.
Level: Undergraduate Level 2 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3001 Advanced Engineering Topic 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3001/) Legacy Code: 300666
This subject provides students with the opportunity to tackle challenging engineering problems. They will study advanced topics in selected areas under the supervision of academics. The advanced topics will prepare students for further study and research.
Level: Undergraduate Level 3 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3003 Biomedical Electronics (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3003/) Legacy Code: 301122
This subject will cover recent advances in biomedical electronics including electronic diagnostic devices, implanted devices, human-computer-interface, bioinstrumentation and neuromorphic engineering. Topics covered span from the bio-electromagnetism and related applications to regulatory aspects (IEC standards and TGA/FDA approval processes) and electrical safety of instrumentation. This subject will have a strong practical design focus with laboratories and tutorials focused on the design of real instrumentation (including manufacturing) dealing with real biomedical signals.
Level: Undergraduate Level 3 subject
Pre-requisite(s): ELEC 2001 OR
ENGR 2001
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3004 Biomedical Signals and Data Analysis (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3004/) Legacy Code: 301121
This subject will cover recent advances in biomedical signal and data analysis including electrocardiography, electroencephalography, human-computer-interface, electromyography, biomedical images and spikes processing. Topics covered span from basic to advanced signal processing. This subject will have a strong practical design focus with laboratories and tutorials focused on the design of usable software packages dealing with real biomedical signals.
Level: Undergraduate Level 3 subject
Pre-requisite(s): ELEC 2001 OR
ENGR 2001
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3006 Control Systems (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3006/) Legacy Code: 300009
This subject introduces the fundamental concepts of automatic control engineering. It covers traditional and contemporary design and analysis techniques; the concepts required to design continuous time and discrete time controllers. Matlab is utlilized considerably.
Level: Undergraduate Level 3 subject
Pre-requisite(s): ELEC 2011 OR
MECH 3004
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3010 Design Studio 4: Innovation through Systems Thinking (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3010/) Legacy Code: 301080
From 2020, this unit will be replaced by 301292 - Biomechanics in Product Innovation. This unit explores strategies for Industrial Design within the complex context of design work in the 21st century. Students will carry out projects in user-centred design, developing an innovative responses to a semi-open and open briefs using the CDIO (Conceive, Design, Implement, Operate) process. The projects will range from low fidelity cardboard prototypes to more fully developed everyday products and services that can be implemented and operated to meet an identified user need.
Level: Undergraduate Level 3 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3013 Engineering Science Project 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3013/) Legacy Code: 300967
This subject describes engineering as a profession, including professional ethics, legal obligations and fundamentals and theories related to project management. The focus will be on development of research and presentation skills of students enrolled in this subject. It will be achieved through employment of appropriate research skills on a capstone project which demonstrates student's knowledge in identifying and planning an engineering project.
Level: Undergraduate Level 3 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3014 Engineering Science Project 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3014/) Legacy Code: 300968
In this unit, the focus will be on development of research and presentation skills of students, which will be achieved through employment of appropriate research skills on a capstone project. It will demonstrate student's knowledge by conducting an engineering project and completion of a technical report.
Level: Undergraduate Level 3 subject
Pre-requisite(s): ENGR 3013
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3017 Industrial Experience (Engineering) (0 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3017/) Legacy Code: 300741
Industry experience is a significant opportunity for students to understand employer expectations in relation to working on projects and with others in a professional capacity. Students undertake 12 weeks full-time (37.5 hours per week) employment (or equivalent) to obtain relevant workplace experience in Engineering under the supervision of professional engineers in one or more companies. Students identify learning opportunities and goals with a focus on applying academic learning in practice, learning project management, work culture, professional attitude and self-awareness. Students develop critical reflective skills in reporting their progress.
Level: Undergraduate Level 3 subject
Equivalent Subjects: ENGR 3016 - Industrial Experience (Engineering)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3020 Numerical Methods in Engineering (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3020/) Legacy Code: 300488
The finite element method is a powerful numerical tool for analysing a wide range of engineering problems. The objective of this subject is to introduce the basic and fundamental principles of the finite element techniques by primarily focusing on their applications in the area of structural, solid and soil mechanics.
Level: Undergraduate Level 3 subject
Pre-requisite(s): MATH 1019 AND
MECH 2003
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3021 Professional Practice (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3021/) Legacy Code: 300053
This subject focuses on ethical conduct for construction managers and on the range of procurement systems utilised in the modern construction industry. It deals with matters of professional responsibility to the community, as well as, honourable and lawful practices in the conduct of business. The issues of confidentiality of information and conflict of interest are examined in the context of real project histories. Risk management and its relationship with quality project delivery are considered in the light of the changing nature of an industrialised, digitalised and globalised construction industry.
Level: Undergraduate Level 3 subject
Pre-requisite(s): ENGR 1029 OR
ENGR 1024 OR
ENGR 1036
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3022 Special Technical Project (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3022/) Legacy Code: 301089
This is an elective subject offered to students who are engaged in a School of Engineering, Design and Built Environment approved project (solar car, Greenhouse, Formula SAE, Purple roof and sustainable house). The subject can be taken during the third year of Engineering, Construction Management and Industrial Design programs and is a capstone subject for students enrolled in Minor Eco-Socially Conscious Design and Manufacturing. This subject consolidates and deepens a student's knowledge and capabilities developed through previous years of study. Students will develop complex solutions by collaborating with various discipline specialists. This subject develops management, reflective and leadership skills including the ability to work with team members from other fields of study through practical application.
Level: Undergraduate Level 3 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3023 Biomechanics in Product Innovation (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3023/) Legacy Code: 301292
In this subject students apply practical design thinking skills to propose viable solutions for solving complex problems in both human and environment centred contexts. Whilst working on an industry-based project, students will develop an understanding of human biomechanics and human anatomy and the challenges they bring to the design process. Students interested in design-based careers which involve improving ways people interact with products, systems and spaces will benefit from the skills developed in this subject.
Level: Undergraduate Level 3 subject
Equivalent Subjects: ENGR 3010 Design Studio 4 Innovation through Systems Thinking
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3024 Design Research Methods (Advanced) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3024/) Legacy Code: 301291
Design and user research methods are critical in establishing efficient and effective processes around resource utilisation in designing, conducting and presenting research findings that are succinct yet open to new innovations. A range of advanced research design methods are presented and students are guided to the strategic selection of methods appropriate to their own self-sourced project theme. Data collection instruments are designed, operationalised, data coded and analysed via both qualitative and quantitative techniques and discussed in a vibrant peer environment inspired by design thinking and other research methods unique to the design profession and within university human ethics policy protocols.
Level: Undergraduate Level 3 subject
Equivalent Subjects: ENGR 3012 - Designed Inquiry ENGR 3005 - Contextual Inquiry
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3025 Designing for Circular Economy (Advanced) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3025/) Legacy Code: 301293
Students examine their local circular economy and the United Nations Sustainable Development Goals 2030 (UNSDG) principles as they apply to designing a sustainable future with Circularity for extended product life cycle, reuse, remanufacture, value up-cycling, production, and waste resource management. Students work on an industry-based, real-world, socio-technical, environmental challenge project in collaboration with community and industry partners. The project is based in the local Western Sydney region and students propose design solutions that are scalable and relatable in diverse contexts. Students will be able to apply their awareness of the sustainability requirements within the community and industry to their future career activities, by creating new value, and new green employment opportunities with a sustainability skills approach.
Level: Undergraduate Level 3 subject
Equivalent Subjects: ENGR 2021 Sustainable Design Sustainable Futures
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3026 Design Thinking for Successful Brands and Products (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3026/) Legacy Code: 301301
Students will learn how to develop a strategic design management plan that helps a firm not only present itself to its target audience but also clearly differentiate amongst competitors. Foundation design principles involving the evaluation of two-dimensional and three-dimensional designs are explored through a series of case studies based on commercially successful design management strategies. To simulate global, real-world design consultation scenarios students interact in an online environment in preparation for evidence-based innovation in their future workplaces as design managers.
Level: Undergraduate Level 3 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3027 Mentored Practice in Design Innovation (0 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3027/) Legacy Code: 301296
Students will be acculturated to professional practice and conduct in a real work environment setting through a series of webinars and self-guided industry placement. On conclusion of the unit, students will develop a report that summarises their own personal reflections relating to workplace responsibilities, and other experiences accrued throughout the unit. Mentored Practice in Design Innovation seeks to match students with mentors in areas they aspire to be prospective employees or in related fields of professional interest across a 10-week program.
Level: Undergraduate Level 3 subject
Equivalent Subjects: LGYA 2390 - Industrial Experience ENGR 3015 - Industrial Experience
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3028 Mentored Practice in Design Innovation (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3028/) Legacy Code: 301401
Mentored Practice offers a program of professionally oriented activities that refine planning for graduate destinations in the design, innovation and manufacturing industries and in particular new product development. Students will focus on career and practical industry attributes, and attend design industry seminars that directly influence their major project, honours thesis, or industrial design capstone project from a strategic and professional practice perspective. This subject assists students on preparing a strategic early career plan which includes a personal portfolio of works with tips on how to commercialise their current academic project, observations and analysis of current design industry practice, and a self-directed practical placement for up to 70 hours.
Level: Undergraduate Level 3 subject
Equivalent Subjects: ENGR 3031 Mentored Practice in Design (Industry)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3029 Specialisation Workshop 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3029/) Legacy Code: 301438
This subject is designed to enhance technical skills development in an engineering discipline. The subject enables students to perform the practical aspects that relate to product development, manufacturing, infrastructure development and service delivery. It also enables students to gain skills to plan, communicate, operate and manage workshops, laboratory settings and work sites while working in a team environment.
Level: Undergraduate Level 3 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3030 Specialisation Workshop 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3030/) Legacy Code: 301439
This subject is designed to further enhance technical skills development in a team environment and in an engineering discipline through additional workshops that compliment and strengthen those completed in previous subject Specialisation Workshop 1. The subject enables students to perform and manage the practical aspects that relate to product development, manufacturing, infrastructure development and service delivery. It also enables students to gain skills to plan, communicate, operate and manage workshops, laboratory settings and work sites while working in a team environment.
Level: Undergraduate Level 3 subject
Pre-requisite(s): ENGR 3029
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3031 Mentored Practice in Design (Industry) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3031/)
Mentored Practice in Design (Industry) is designed to provide students with professional practice experience working with an industry mentor and a multi-disciplinary team. Students prepare for their experience and create an action plan documenting their skills and knowledge with the aim of enhancing these throughout the semester. This prepares them for a reflective report and mentorship presentation. Students are assisted finding a suitable mentor in areas in which they aspire to be prospective employees or in related fields of professional interest across a 10-week program responding to the changing Future of Work. This subject can be undertaken during any semester during the year and can most likely be completed during semester breaks either in Winter or Summer. Students gain valuable insights in the professional practice setting of themselves and of industry expectations, providing opportunities for employment.
Level: Undergraduate Level 3 subject
Equivalent Subjects: ENGR3015 Industrial Experience
ENGR3027 Mentored Practice in Design Innovation
ENGR3028 Mentored Practice in Design Innovation
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3032 Humanitarian Design and Practice (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3032/)
In this subject, students will learn community engagement strategies and prototype development using the framework of human-centered design. Through international and domestic mobility programs students will collaborate with local stakeholders to co-develop solutions for priority community needs. Drawing on inter-disciplinary approaches (combining social sciences, design and engineering), students will gain socio-technical skills and apply these to real-world humanitarian problems such as disaster preparedness and sustainable development. This subject is co-designed and delivered with industry partners (e.g. Engineers Without Borders, RedR) and will prepare students for career pathways working with regional and international industry agencies and local community partners in other countries to develop humanitarian engineering interventions.
Level: Undergraduate Level 3 subject
Pre-requisite(s): ENGR 1043 OR
ENGR 1024
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 3033 Digital Manufacturing and IIoT (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr3033/)
This subject offers specialised knowledge and skill development in the areas of Digital Manufacturing and Industrial Internet of Things (IIoT), both important components within the landscape of Industry 4.0 and Advanced Manufacturing. Built into an ecosystem of connected devices in the digital manufacturing context, IIoT serves as an invaluable tool, providing insights into production processes. Moreover, it equips industries with heightened competitiveness, fosters innovation, and enhances customer experiences. As these technologies continue to evolve, artificial intelligence and machine learning will play an essential role in providing useful data for informed decision-making and production enhancements. Throughout this subject, students will discover the significance of IIoT in digital manufacturing, including its underlying technologies and system architecture while cultivating proficiency in digital manufacturing processes. Upon successful completion of this subject, students can explore a range of career avenues, including roles such as Digital Manufacturing Engineer, IIoT Solutions Architect, Manufacturing Data Analyst and IoT Product Manager.
Level: Undergraduate Level 3 subject
Co-requisite(s): ENGR 2035
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4001 Advanced Engineering Topic 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4001/) Legacy Code: 300667
This subject provides students with the opportunity to tackle engineering problems that are more challenging than those in Advanced Engineering Topic 1. They will study advanced topics in selected areas under the supervision of academics. The advanced topics will prepare students for further study and research.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 3001
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4004 Design Studio 6: Ambience, Place and Behaviour (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4004/) Legacy Code: 301084
Designers responding to complex societal challenges require focus on people, places and systems thinking to make sense in guiding new investment in innovation. This subject builds industrial design expertise in four domains including human environments, responsible design, user-centred design, and technology development through applied design research, contextual inquiry methods, and articulation of innovation proposals through conceptual and validated physical modelling, and an interdisciplinary consultative viewpoint.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4003
Equivalent Subjects: ENGR 3011 - Design Studio 4 Simulate to Innovate
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4005 Engineering Project (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4005/) Legacy Code: 300483
This is a 20 credit point year-long subject taken over two terms (10 credit points in each term). This subject includes a capstone project which demonstrates student's professional level of identifying, planning, designing, executing, testing and documenting an engineering project or activity.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 3021
Co-requisite(s): ENGR 3017
Equivalent Subjects: LGYB 1037 - Civil and Environmental Engineering Project 2
Incompatible Subjects: LGYA 6084 - Engineering Thesis ENGR 4023 - Advanced Engineering Thesis
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4006 Engineering Project 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4006/) Legacy Code: 300971
This subject describes engineering as a profession, including professional ethics and legal obligations highlighted. Fundamentals and theories related to contract and project management will form part of this subject. Throughout the semester, the focus will be on development of research and presentation skills of students enrolled in this subject. This will be achieved through employment of appropriate research skills on a capstone project which demonstrates student's professional level of identifying, planning, and designing engineering project and completion of a technical progress report. The capstone project will be continued in subject 300972 Engineering Project 2.
Level: Undergraduate Level 4 subject
Co-requisite(s): ENGR 3017
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4007 Engineering Project 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4007/) Legacy Code: 300972
Throughout the semester, the focus will be on development of research and presentation skills of students enrolled in this subject. This will be achieved through employment of appropriate research skills on a capstone project which demonstrates student's professional level of executing, testing and documenting an engineering project and completion of a technical report. This subject is a continuation of 300971 Engineering Project 1.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4006
Co-requisite(s): ENGR 3017
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4010 Major Project Completion (30 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4010/) Legacy Code: 300460
Major Project Completion is the project realisation component of the student's final year program. The subject offers the student the chance to consolidate the range of methodologies and processes developed and evaluated in Major Project Commencement, that contextualise the principles and practices that will lead to the realisation of their identified design solution. The final design outcome will form part of the final year graduate exhibition. The design solution which students will be developing and submitting for this subject responds to the design brief developed in Major Project Commencement.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4009
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4011 Sustainability and Risk Engineering (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4011/) Legacy Code: 300798
Analysis of sustainability with engineering perspectives is increasingly becoming important in the modern world. Also, often the risk analysis is required to be carried for true sustainable solutions. Engineers with in-depth understanding of different tools that can be used for both sustainability and risk analysis will have significant edge in their future career. The students will discuss and understand various engineering issues including renewable/alternative energy systems, energy/resource efficiency, sustainable/green buildings, sustainable transport and infrastructure, sustainable water management, environmental management systems, sustainability reporting, life cycle analysis, probability/reliability theory, risk assessment models and, overall system analysis.
Level: Undergraduate Level 4 subject
Pre-requisite(s): CIVL 2002 AND CIVL 4017
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4012 Industrial Design Major Project (Ideation) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4012/) Legacy Code: 301297
In this capstone subject students will immerse themselves in a complex real-world design problem and apply their expertise in conceptualisation, problem solving, human factors and aesthetics to create a novel solution. User-centred design, digital futures and sustainable design practice underpin all learning activities. A multidisciplinary approach is fostered, whereby students will engage with industry experts and community groups reinforcing the role of the graduate designer as an empathetic innovator.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4020 OR
ENGR 4004
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4013 Creative Business Model Innovation (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4013/) Legacy Code: 301303
Innovation requires an agile mindset (being flexible and responsive), a broad view of social, economic, and environmental factors, and awareness of interdisciplinary approaches to succeed in a competitive marketplace. Students explore strategic directions for enterprises in creative ways through practical engagement and application of business model innovation methods and tools in a fully online learning environment comprising digital content and live webinars. Creative sustainable business model specialists are sought after in the marketplace, and this subject provides insights in developing these specialist skills, thus highlighting students' potential as future business leaders.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4014 Design Practice: Manufactured Product Lifecycle (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4014/) Legacy Code: 301310
Visualisation analytics for sustainable manufacturing practices provide an essential contribution to planning and adoption for new product development. The application of product lifecycle management (PLM) methods through software interfaces permits the establishment of a digital environment to create, manufacture and manage innovation on a comprehensive basis. Students will engage with an innovation project from a PLM perspective as an extended enterprise with focus on time to market, waste optimisation, prototyping efficiency, and value chain collaboration.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4015 Design Practice: Self-Directed Specialised Mentor Project (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4015/) Legacy Code: 301311
Mentorship is highly regarded in preparation for accelerated understanding of the competitiveness and excitement of professional practice. Specialised mentors provide insights and engage students in co-creative processes and guide the pursuit of design innovations that challenge markets and redefine career progression and employment opportunities. This subject permits students to develop their own idea from conceptual discovery to market strategy and launch preparations with the view to build a new commercial pathway and personal resilience by creating a new value proposition of merit.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4016 Design Practice: Sustainable Components (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4016/) Legacy Code: 301309
New Product development in architecture and construction industries draws upon construction knowledge, applied materials specification, design for durable systems, component interfaces supporting assembly and robust design principles with aesthetic considerations, functional and desirable product attributes. This subject forms part of the Design Practice specialisation and builds upon the principles of sustainable manufacturing and product life cycle in response to an emergent construction theme. In this subject, entrepreneurship and product detailing assist decisions that drive future advancements in construction component design.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4017 Design Thinking for Competitive Advantage (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4017/) Legacy Code: 301302
Design Thinking has become widely adopted as a novel problem solving mechanism and asset to market growth, resource utilisation, and competitiveness. This approach incorporates human-centric attributes and iterative processes which are features of professional designers co-creating with stakeholders. In this unit, students focus on empathic viewpoints associated with understanding people, markets and the environment. They explore future possibilities for communities using decision-making processes, informed by global challenges as represented through the UNSDGs. This new global societal driver for equitable living standards, economic prosperity, and sustainable societies is explored through online study involving a series of webinars, digital interactions, and conclude with a student prototype presentation.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4018 Industrial Design Major Project (Conclusion) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4018/) Legacy Code: 301298
In collaboration with industry experts and community groups students will refine and complete their capstone project which was conceptualised and proposed in Industrial Design Major Project (Ideation). Students will advance their responses to complex, real-world design problems and refine their expertise in conceptualisation, problem solving, human factors, aesthetics, innovation and communication to deliver a novel product solution to stakeholders as work-ready graduates.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4020 OR
ENGR 4004
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4019 Start-Up Product Launch (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4019/) Legacy Code: 301304
Students, working in cross functional teams and as individuals, will develop a mature value proposition for validation and launch of a market-ready product or service that includes promotional narratives and artefacts. Students will focus on entrepreneurial innovation and lean start-up models using design-led strategies such as CANVAS modelling, minimum viable product (MVP), and launching in addition to strategies for securing external funding for projects. Students will be well placed to create dynamic adaptive organisation for business, government, wider communities and start-up businesses as career professionals.
Level: Undergraduate Level 4 subject
Equivalent Subjects: ENGR 3008 - Design Management 4 Design Process ENGR 4002 - Design Management 4 Strategy and Lean Start-Up
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4021 Studio: Interdisciplinary Global (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4021/) Legacy Code: 301294
This subject engages students in a collaborative evidenced based project with local and international expert partners including NASA in the thematic area of Designing for Space Missions 2025 for astronaut health and space architecture for habitat design. Students are able to explore new concepts and integrate their skills within teams across unique research domains. The traditional linear thinking of creativity and innovation is challenged, giving way to a dynamic workspace for discussion, exploration, discovery, critical reflective practice, and maker-culture. This leads to new co-created interdisciplinary innovations which assist in the preparation of students for the Future of Work and decision-making across diverse teams. The focus on the physical and psychological aspects of space are also informing new viewpoints in designing with COVID19 in the Built Environment.
Level: Undergraduate Level 4 subject
Equivalent Subjects: ENGR 3009 - Design Studio 3 Product Realisation ENGR 4003 - Design Studio 5 Symbol and Meaning Making
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4022 Studio: Design Synthesis Capstone (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4022/) Legacy Code: 301402
This subject engages students in a significant project that synthesises creative thinking, design strategy and practical design skills in preparation to be 'work-ready' as a designer upon graduation. Students will apply the skills that they have acquired throughout their degree in core and specialised elective subjects toward their Design Capstone project. The amalgamation of multidisciplinary viewpoints with industry collaborators throughout the subject ensures a vibrant learning environment, culminating in well resolved design outcomes within a Work Integrated Learning (WIL) Framework with linkages to a real-world challenge.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4023 Advanced Engineering Thesis (60 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4023/) Legacy Code: 300668
This is a 60 credit point year-long subject taken over two terms (30 credit points in each term).This subject provides students with the opportunity to conduct original research on their chosen topics under the supervision of academics. Students are encouraged to disseminate their research results as refereed publications.
Level: Undergraduate Level 4 subject
Incompatible Subjects: LGYA 6084 - Engineering Thesis ENGR 4005 - Engineering Project ENGR 4033 Honours Thesis
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4024 Construction Management Honours Thesis (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4024/) Legacy Code: 301160
This is a 20 credit point year-long subject taken over two terms (10 credit points in each term). This subject provides honours level students with the opportunity to undertake research on a specialist topic within their program of undergraduate studies. Each student is assigned to a supervisor (an expert researcher) based on the chosen research topic. Students are expected to meet the supervisor regularly and work progressively to complete the research. This research will be an extended investigation of a chosen subject that is undertaken using appropriate research methods. In addition to the specialist knowledge on the chosen research topic, students will learn a range of skills including academic writing, project management, critical thinking and analytical skills.
Level: Undergraduate Level 4 subject
Incompatible Subjects: BLDG 4005 - Major Project in Construction
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4025 Final Year Project 1 (UG Engineering) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4025/) Legacy Code: 301245
This subject describes engineering as a profession, highlighting professional ethics and legal obligations. The focus will be on the development of design skills or research and presentation skills for students enrolled in this subject. This will be achieved through the use of appropriate design/research skills on a capstone project, which will be either design oriented or research oriented on a specialist topic. Under the direction of an academic supervisor and research mentor, the project will demonstrate the student's professional level of identifying, planning, and designing an engineering project while at the same time completing a technical progress report. The capstone project will be continued in the subject Final Year Project 2 (UG Engineering).
Level: Undergraduate Level 4 subject
Co-requisite(s): ENGR 3017
Equivalent Subjects: ENGR 4031 Engineering Thesis 1
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4026 Final Year Project 2 (UG Engineering) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4026/) Legacy Code: 301246
This subject continues the on-going work started in subject Final Year Project 1 (UG Engineering). Throughout the semester students will further develop their design, research and presentation skills. This will be achieved through employment of appropriate design/research skills to finish a capstone project, either design-oriented or research-oriented project, which demonstrates student's professional level of executing, testing, documenting an engineering project and completing a technical report.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4025
Equivalent Subjects: ENGR 4032 Engineering Thesis 2
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4027 Industrial Design Applied Research Project (Honours) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4027/) Legacy Code: 301299
The Industrial Design Honours Program provides candidates with an opportunity to undertake a significant design research project and research training component that explores design issues including products, services, systems and research methods. In this subject students combine scholarly inquiry, critical thinking, design thinking, applied design research methods and exploratory prototyping informed by state of the art research via literature review, and human-centred design methods with ethical considerations. Discussion of results of preliminary concept explorations of low to medium fidelity are further refined towards a reframed and detailed design brief, research project timeline, and evolved design research methodology in preparation for a high quality research proposal and a substantial creative work.
Level: Undergraduate Level 4 subject
Equivalent Subjects: LGYC 4734 Industrial Design Project (Commencement)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4029 Industrial Design Project (Completion) (40 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4029/) Legacy Code: 300774
The Industrial Design Honours Program provides students with an opportunity to apply their industrial design skills to an in-depth year long design research project. In Industrial Design Major Project (Completion), Honours candidates respond to the research findings and design brief that they produced in Autumn semester. They undertake detailed design development to resolve and communicate a final design solution, which is publicly exhibited at the end of the year. Their design and research communications present a strong argument for the final design and demonstrate the honours candidates capacity to undertake postgraduate design research and to join professional design practice.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4028
Equivalent Subjects: LGYB 1049 - Industrial Design Project (Completion)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4030 Industrial Design Research Thesis (Honours) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4030/) Legacy Code: 301300
In this unit, students will extend their research journey using appropriate applied design research methods that explore usability, design semantics, functionality, sustainability and product considerations. Students will submit a creative project and exegesis on their research endeavour providing a critical analysis and reflection on outcomes that situate the work within relevant literature, ideas and industrial design field discourse. In addition to the specialist knowledge on the chosen research topic, students will learn a range of skills including academic writing, and project management.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4027
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4034 Climate Smart Engineering (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4034/) Legacy Code: 301420
Climate change is one of the most significant and urgent challenges facing the world today. In this unit, students will learn and appropriately apply scientific principles, in an engineering context, to reduce our impact on climate as well as in adopting to changing climate conditions. Students will explore both current and emerging technologies, that address climate change, in order to propose workable real world solutions.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4035 Smart and Liveable Cities (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4035/) Legacy Code: 301423
Students will apply smart and sustainability perspectives to design urban centres. Students will use a range of tools to conduct integrated system analysis for smart and liveable cities. Students work on real world projects including green buildings, blue/green space, sustainable transport and infrastructure, sustainable water management. Though these projects, students will achieve significant edge in their employability.
Level: Undergraduate Level 4 subject
Pre-requisite(s): CIVL 2002 OR ENGR 1050
Equivalent Subjects: ENGR 4011 Sustainability and Risk Engineering
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4036 Advanced Engineering Thesis 2: Detailed Investigations (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4036/) Legacy Code: 301484
Advanced Engineering Thesis 2 - Detailed Investigations subject consists of a research project designed and implemented under the direction of an academic supervisor and research mentor. This subject is the culmination of studies for students who have completed their first three years of an undergraduate degree and provides substantial training in detailed Investigations. Under staff supervision, students are allocated a particular topic for their research, design their own programme of research, and perform the research. The emphasis of this subject is on the application of research knowledge gained in other subjects and in Engineering Thesis 1 - Preliminary Investigations to the practical conduct of the individual research project. This subject provides final year Advanced engineering students with the opportunity to undertake research on a specialist topic within their Key Program of undergraduate study.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4037
Equivalent Subjects: MECH 4006 - Advanced Engineering Thesis 2 Detailed Investigations
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4037 Advanced Engineering Thesis 1: Preliminary Investigations (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4037/) Legacy Code: 301485
Advanced Engineering Thesis 1 - Preliminary Investigations subject consists of a research project designed and implemented under the direction of an academic supervisor and research mentor. This subject is the culmination of studies for students who have completed their first three years of an undergraduate degree and provides substantial training in Preliminary Investigations. Under staff supervision, students are allocated a particular topic for their research, design their own programme of research, and perform the research. The emphasis of this subject is on the application of research knowledge gained in other subjects to the practical conduct of the individual research project. This subject provides final year Advanced engineering students with the opportunity to undertake research on a specialist topic within their undergraduate field of study.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4038 Biomedical Electronics (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4038/)
This subject will cover recent advances in biomedical electronics including electronic diagnostic devices, implanted devices, human-computer-interface, bioinstrumentation and neuromorphic engineering. Topics covered span from the bio-electromagnetism and related applications to regulatory aspects (IEC standards and TGA/FDA approval processes) and electrical safety of instrumentation. This subject will have a strong practical design focus with laboratories and tutorials focused on the design of real instrumentation (including manufacturing) dealing with real biomedical signals. This subject uses basic and advanced electronic concepts including circuit simulator(s), embedded systems and requires manual assembly of circuits. Recap and catch-up modules to electronics, signal conditioning, advanced mathematics concepts such us Fourier Transform and their application to electronics as well as circuit simulator training and electronic instruments use training are provided, for students from non Electronic/Electrical background.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4039 Design for Advanced Manufacturing (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4039/)
This subject develops specific knowledge and skills in Design for Advanced Manufacturing technologies in the context of Industry 4.0 and Advanced Manufacturing. Advanced manufacturing represents state-of-the-art and cutting-edge manufacturing technologies and processes for high-quality and high precision production of materials and products. Throughout this subject, students will learn advanced manufacturing technologies and processes that lead to the transformation of materials and products into intelligent, sustainable, eco-friendly, and environmentally-conscious practices. Moreover, students will develop the ability to discern suitable practices, materials, and manufacturing processes, as well as analyse the outcomes of Advanced Manufacturing, with a focus on sustainability, efficiency, safety, and ethical considerations, all in the context of their application to the WSU Formula SAE Car Project. Upon successful completion of this subject, students can explore a range of career avenues, including roles such as Manufacturing Engineer, Product Designer, CAD/CAM Engineer, Materials Engineer, and related opportunities.
Level: Undergraduate Level 4 subject
Co-requisite(s): ENGR 3033
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4040 Industrial Design Major Project (Ideation & Studio Practice) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4040/)
In this Industrial Design capstone subject, students will immerse themselves in a complex real-world design problem, with considerable social impact, which consolidates their industrial design knowledge and skills. Students will apply themselves in the areas of concept generation and iterative industrial design processes and problem solving. They will incorporate human factors and desirable consumer attributes to produce a creative and novel solution which meets manufactured quality standards and high-level sustainability principles. All learning activities are underpinned by Industrial Design professional practice, as well as research methods for user-centred design, health and wellbeing, digital futures, ergonomics, and sustainable design practice. During their design project, students will engage with industry experts and community groups reinforcing their role, upon graduation, as empathic innovators, and industrial design practitioners with a multidisciplinary viewpoint.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR4022 Studio Design Synthesis Capstone
OR
ENGR4004 Design Studio 6
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4041 Final Year Project 1 (UG Engineering) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4041/)
In this subject students develop the foundations for a year-long capstone project which may be either design or research oriented. Throughout the semester, students will develop their design, research and presentation skills under the supervision of academic or industry mentors as co-supervisors. This capstone project work develops a student's ability to identify, plan, test, execute, document and report on an engineering project at a high level. The capstone project will be completed and finalised in "Final Year Project 2 (UG Engineering)". Students completing the Final Year Project 1 and the Final Year Project 2 associated subjects will develop skills relevant to their future careers as engineers or as a pathway to higher degree studies.
Level: Undergraduate Level 4 subject
Co-requisite(s): ENGR 3017
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4042 Final Year Project 2 (UG Engineering) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4042/)
This subject continues and finalises the project started in subject "Final Year Project 1 (UG Engineering)" incorporating more in-depth and detailed investigations. Throughout the semester students will develop their design, research and presentation skills under the supervision of academic or industry mentors as co-supervisors. Students will deliver either a design or a research oriented capstone project at a professional level. This capstone project demonstrates a student's ability to plan, test, execute, document and report on an engineering project at a high level. Students completing this subject will develop skills relevant to their future careers as engineers or as a pathway to higher degree studies.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4041
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4043 Advanced Engineering Thesis 1: Preliminary Investigations (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4043/)
In this subject, advanced students develop the foundations for a year-long, specialist research project within their Major area of study. To begin work on their thesis during the semester students will develop a high-level research proposal by identifying gaps in research literature, designing their research methodology and beginning work on the technical aspects of their project under the supervision of academic or industry mentors as co-supervisors. Advanced students, completing their individual research project, are expected to work with minimal supervision to manage the project and are responsible for solving issues as they arise and communicating their findings at a high level. The thesis will be completed and finalised in "Advanced Engineering Thesis 2: Detailed Investigations". Students completing these 2 associated subjects will develop skills relevant to their future careers as engineers or as a pathway to higher degree studies.
Level: Undergraduate Level 4 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 4044 Advanced Engineering Thesis 2: Detailed Investigations (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr4044/)
In this subject, advanced students will finalise their year-long, specialist research project begun in "Engineering Thesis 1 - Preliminary Investigations" with the completion of a thesis document. To build on the work begun in semester 1 students will project manage and complete the technical aspects of their project, produce a research paper suitable for journal publication, present on their research and finalise their thesis under the supervision of academic or industry mentors as co-supervisors. Advanced students, completing their individual research project, are expected to work with minimal supervision to manage the project and are responsible for solving issues as they arise and communicating their findings at a high level. Students completing Advanced Engineering Thesis 1 and Advanced Engineering Thesis 2 associated subjects, will develop skills relevant to their future careers as engineers or as a pathway to higher degree studies.
Level: Undergraduate Level 4 subject
Pre-requisite(s): ENGR 4043
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 5001 Fire Engineering 1 (Fire Dynamics) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr5001/)
This subject is essential for anyone considering a career in Fire Safety and aims to develop detailed knowledge of fire behaviour and dynamics in the built environment. Students will better understand fuels and combustion processes, the chemistry of combustion, flammability limits, ignition characteristics and different types of flames and fire plumes. The subject also introduces students to the basic principles of fire safety design so that they can appreciate fire safety and develop appropriate fire safety engineering solutions.
Level: Postgraduate Coursework Level 5 subject
Equivalent Subjects: ENGR7006 Fire Engineering 1 (Fire Dynamics)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 6001 Bushfire Design and Climate Change (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr6001/)
This subject considers the concept of 'design bushfire' and the impact of climate change upon varying weather and climate conditions in Australia and globally. The potential implications of climate change on bushfire behaviour and bushfire design are developed. Students will be introduced to the concept of "Bushfire Protection Design Guidelines" including the concepts of Bushfire Design Brief and Bushfire Design Subsystems, as well as the Bushfire Verification Method adopted by the National Construction Code. Students will be able to calculate recurrence conditions for bushfire behaviour and bushfire weather conditions using extreme values techniques. Students will compare different bushfire behaviour models and their implications for future climatic conditions in developing performance solutions for bushfire protection. The role of landscape fires and fire generated winds will also be considered in the context of planning and building for bushfire protection. The role of traditional Aboriginal burning practices and culture also forms an important aspect of this subject.
Level: Postgraduate Coursework Level 6 subject
Equivalent Subjects: -
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 6002 Planning for Bushfire Prone Areas (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr6002/)
This subject describes the relevant planning issues for bushfire prone areas and the measures that can be implemented to ensure appropriate development in these areas. Through collaboration with industry professionals students learn that knowledge and understanding of the planning, design and construction of the urban form is important in managing the risk of bushfire in the community. It is also fundamental in understanding of the management of development for bushfires and the necessary infrastructure requirements for bushfire suppression and property protection in bushfire prone areas. Students evaluate and report on planning principles and legal issues in bushfire prone areas, as well as use the legislative framework to determine impacts on property and assets. This subject challenges students to become more strategic thinkers in planning and preparing for bushfire. Knowledge gained in this subject/program will benefit students aspiring to careers such as bushfire consultants and land-use planners.
Level: Postgraduate Coursework Level 6 subject
Equivalent Subjects: ENGR 7016 - Planning for Bushfire Prone Areas
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 6003 Fire Technology and Engineering Principles (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr6003/)
The subject introduces students to the basic principles of fire behaviour and fire safety design so that they can appreciate fire safety principles and interpret fire safety engineering design concepts. Students will learn the basics of combustion, building fire characteristics, smoke movement, responses of fire safety devices, building fire resistance, response of building occupants, fire safety engineering design and assessment methodology. The subject provides the basis for understanding fire safety engineering and the techniques and tools used in fire safety engineering. The subject is designed for building surveyors, who will be assessing performance solutions by fire safety engineers.
Level: Postgraduate Coursework Level 6 subject
Incompatible Subjects: ENGR7011 Fire Technology Principles ENGR7009 Fire Engineering Principles
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7001 Advanced Engineering Project 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7001/) Legacy Code: 301006
In this unit, the students will be working on a major engineering project as a team of 2 to 5 students. The project will be supervised by an academic staff on topics related to his/her research expertise. The students will apply and further develop their expertise in research, engineering project management and planning, work health and safety, and professional writing skills. The students are required to present outcomes using a professional report which should include a background, objectives, a comprehensive literature review, the methodology and a project plan which can then be completed in Advanced Engineering Project 2.
Level: Postgraduate Coursework Level 7 subject
Co-requisite(s): ENGR 7013
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7002 Advanced Engineering Project 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7002/) Legacy Code: 301007
In this subject, students will complete the major engineering project commenced in subject 301006 Advanced Engineering Project 1. The students are expected to develop advanced technical knowledge and skills in their field of study as well as the ability to function effectively as an individual in a team, with the capacity to be a leader or manager. The students are required to present outcomes using a professional report and an oral presentation.
Level: Postgraduate Coursework Level 7 subject
Pre-requisite(s): ENGR 7001
Co-requisite(s): ENGR 7013
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7004 Bushfire Fighting (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7004/) Legacy Code: 200500
This subject describes the techniques, hardware and extinguishing agents used to fight and control bushfires and focuses on the logistics involved in ensuring safe, efficient and effective control. The content includes bushfire fighting strategies in the context of rural and interface environments, hazard reduction and brigade structure arrangements. The role of planning in supporting firefighting through water supply and access is also considered as are the findings from various Public Inquiries.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7005 Emergency Management for Bushfire Prone Areas (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7005/) Legacy Code: 200459
This subject describes the organisational and administrative arrangements for the management of emergency events in Australia, including the role of States and local government and the techniques available to develop risk management strategies in order to minimise loss of life and property arising from bushfire emergencies. The subject describes how the three tiers of Government interact during major emergency events, the role of community engagement in emergency management and the process of developing a risk management plan for bushfire emergencies. The subject also discusses the role of post-event survey and emergency and evacuation planning at the property scale.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7006 Fire Engineering 1 (Fire Dynamics) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7006/) Legacy Code: 300709
This subject aims to develop a detailed knowledge of fire behaviour and dynamics in the built environment. Students will be able to understand fuels and combustion processes; the chemistry of combustion; flammability limits; ignition characteristics; and different types of flames and fire plumes. The content also covers the burning of liquids and solids; flammable vapour/air mixtures; extinction and extinguishment; flame spread mechanisms and modeling; flashover; fire resistance and fire severity; projection of flames from burning compartment openings; spread of fire from a compartment; production and measurement of smoke; and smoke movement.
Level: Postgraduate Coursework Level 7 subject
Equivalent Subjects: LGYB 8308 - Fire Engineering 1 (Fire Dynamics)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7007 Fire Engineering 2 (Fire Models) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7007/) Legacy Code: 300710
This subject aims to develop an understanding of various types of computational tools used in engineering design of fire safety systems. The fundamentals of control volume, applications of conservations laws in modeling and the form of predictive equations are explained. The content includes evaluations of fire severity, fire resistance levels of various types of building structures and elements. Hand calculation equations, zone models and field models are covered. The limitations of the models in representing the real phenomena are also discussed.
Level: Postgraduate Coursework Level 7 subject
Equivalent Subjects: LGYC 0673 - Fire Engineering 2 (Fire Models)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7008 Fire Engineering Design and Assessment (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7008/) Legacy Code: 300718
This subject helps to develop a high level of knowledge of fire safety systems relevant to life protection and the design and assessment of such systems. The subject covers the process of fire safety engineering design and assessment including the fire engineering brief, conceptual design, regulatory objectives, fire safety engineering subsystems, verification methods, timeline analysis, design fires, evaluation of performance of passive and active fire protection systems, risk analysis and fire engineering project reporting.
Level: Postgraduate Coursework Level 7 subject
Equivalent Subjects: LGYB 5425 - Fire Safety Systems (Life Safety)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7010 Fire Engineering Science (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7010/) Legacy Code: 301048
This subject aims to enhance students' knowledge of the fundamental principles of physics, including heat and mass transfer, fluid mechanism and thermodynamics, which govern the natural phenomena associated with fires. The subject also covers properties of materials, basic mathematics and numerical methods for students to become familiar with quantitative analysis of fire dynamics and structural response. In addition, students will learn probability and risk concepts in fire safety engineering. This is a bridging subject for students who are admitted to the Graduate Certificate and Graduate Diploma in Fire Safety Engineering without an engineering or physical science background. It lays the foundation for further studies in fire safety engineering courses.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7012 Fire Technology and Engineering Principles (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7012/) Legacy Code: 300948
The subject introduces students to the basic principles of fire behaviour and fire safety design so that they can appreciate fire safety systems and interpret fire safety engineering design concepts. The subject covers the basics of combustion, building fire characteristics, smoke movement, responses of fire safety devices, building fire resistance, response of building occupants, fire safety engineering design and assessment methodology. The subject provides the basis for understanding fire safety engineering and the techniques and tools used in fire safety engineering.
Level: Postgraduate Coursework Level 7 subject
Incompatible Subjects: ENGR 7011 - Fire Technology Principles ENGR 7009 - Fire Engineering Principles
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7013 Industrial Experience (PG) (0 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7013/) Legacy Code: 301027
Students will undertake 12 weeks full time (37.5 hours per week) employment (or part time equivalent) to obtain relevant workplace experience in Engineering companies under the supervision of professional engineers in one company or more. This will give the student a solid grounding in the Key Program of engineering which they have chosen to pursue.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7014 Master Project 1 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7014/) Legacy Code: 300597
This subject is a problem based project subject. Students are expected to conduct self studies under supervision by academic staff. Students will identify research topics in consultation with supervisors, carry out literature survey in one of the fields of engineering, construction, information technology or data science. Students will be required to define research objectives and scope, establish research methodology and prepare a research plan.
Level: Postgraduate Coursework Level 7 subject
Equivalent Subjects: LGYA 5830 - Master of Engineering Specialist Reading LGYA 4574 - Built Environment Project LGYA 4576 - Built Environment Research Project
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7015 Master Project 2 (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7015/) Legacy Code: 300598
This subject is a continuation of subject Master Project 1 and is a problem based project subject. Students are expected to conduct self studies under supervision by academic staff and deliver the final outcomes of the research topics that are proposed in Master Project 1. Students will employ the identified methodologies to carry out the research plans and fulfil the research objectives with the defined scope. Each individual student is required to produce an oral presentation and a final written report in one of the fields of engineering, construction, information technology or data science. Students will acquire problem solving skills in this subject.
Level: Postgraduate Coursework Level 7 subject
Co-requisite(s): ENGR 7014
Equivalent Subjects: LGYA 5829 - Master of Engineering Project LGYA 4576 - Built environment Research Project
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7016 Planning for Bushfire Prone Areas (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7016/) Legacy Code: 301049
This subject describes the relevant planning issues for bushfire prone areas and the measures that can be implemented to ensure appropriate development in these areas. A knowledge and understanding of the planning, design and construction of the urban form is important if we are to manage the risk of bushfire on the community. It is also fundamental in our understanding of the management of development for bushfires and the necessary infrastructure for bushfire suppression and property protection in bushfire prone areas. Topics include conceptual planning issues, determining bushfire prone areas, bushfire and planning legislation, strategic and regional planning for bushfire, subdivision, defendable space and construction, design, staging and siting, vulnerable developments, industry and other forms of commercial use, landscaping and maintenance, and water and access.
Level: Postgraduate Coursework Level 7 subject
Equivalent Subjects: ENGR 6002 - Planning for Bushfire Prone Areas
ARCH 7004 - Planning and Development Control
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7017 Professional Practice and Communication (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7017/) Legacy Code: 301005
This subject introduces some of the concepts, standards and techniques associated with the current professional practice for engineering and information technology students. These include the various elements of engineering and IT practice, basic knowledge of contract laws and legal responsibility, competence in verbal and written communication, and an understanding of ethical considerations.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7019 Specialised Software Applications (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7019/) Legacy Code: 301002
This subject offers several streams of practical applications in engineering and industrial design software. Students get to choose a software application stream depending on their key program. Lectures and assignments are delivered online and are enhanced by face to face contact with stream coordinators. Emphasis is placed on teaching students practical software applications skills relevant to industry needs.
Level: Postgraduate Coursework Level 7 subject
Equivalent Subjects: ELEC 7007 - Engineering Software Applications
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7020 Sustainability and Risk Engineering (PG) (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7020/) Legacy Code: 300939
Analysis of sustainability with engineering perspective is increasingly becoming important in the modern world. Also, in the future sustainability will include risk engineering. Hence, engineers with in-depth understanding of different tools that can be used for both sustainability and risk analysis will have significant competitive edge in their future career. The main objective of this subject is to introduce different tools available for sustainability and risk analysis in various engineering applications. The content includes renewable/alternative energy systems, energy/resource efficiency, sustainable/green buildings, sustainable transport and infrastructure, sustainable water management, environmental management systems, sustainability reporting, life cycle analysis, probability/reliability theory, risk assessment models, overall system analysis.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7023 Advanced Biomedical Data and Images (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7023/) Legacy Code: 301211
This subject will cover advanced biomedical signal and data analysis including electrocardiography, electroencephalography, human-computer-interface, electromyography, machine learning and biomedical images. This subject will have a strong practical design focus with laboratories and tutorials focused on the design of usable software packages dealing with real biomedical signals.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7024 Advanced Biomedical Electronics (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7024/) Legacy Code: 301209
This subject will cover advanced design of biomedical electronic devices including, implanted devices, human-computer-interface, bioinstrumentation and neuromorphic engineering. Topics covered span from the bioelectromagnetism and related applications to regulatory aspects (IEC standards and TGA/FDA approval processes) and electrical safety of instrumentation. This subject will have a strong practical design focus with laboratories and tutorials focused on the design of real instrumentation (including manufacturing) dealing with real biomedical signals.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7025 Human Physiology and Biomedical Technologies (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7025/) Legacy Code: 301210
This subject aims to introduce a wide range of biomedical technologies and how they are used in medical practice. Topics will span from data acquisition technologies such as ECG, EEG, body plethysmography, to large imaging diagnostics such as CT scanner, PET scanner and bio-mechanical assisting devices often used for rehabilitation and support. The first part of this subject will include a module on human physiology and bio-mechanics. This module gives a basic understanding of the human body and introduces the scientific and medical terminology used for anatomy, physiology and biochemistry and bio-mechanics.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7026 Performance Solutions for Bushfire Protection (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7026/) Legacy Code: 301265
This subject describes the processes and techniques available to develop performance outcomes to the planning and building of structures required for bushfire protection in Australia. This subject provides advanced methods to address performance when considering bushfire protection measures. It also introduces the 'bushfire protection guidelines' and processes similar to that used in developing performance solutions under the National Construction Code. These include the use of event tree analysis, verification methods, consideration of climate change and the use of annual exceedance probabilities when developing performance solutions. Students are required to develop suitable measures through a performance solution for bushfire protection of a building.
Level: Postgraduate Coursework Level 7 subject
Pre-requisite(s): None
Co-requisite(s): None
Equivalent Subjects: ENGR 7003 Alternate Solutions for Bushfire Prone Areas
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7027 Spatial Tools and Mapping (10 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7027/) Legacy Code: 301264
This subject offers practical applications in spatial information software. Students will be taught using Geographical Information Systems (GIS) software to prepare maps (such as bushfire prone land) as well as management plans required of planning and design practitioners. Workshops are provided to assist students in the practical use of the GIS system. Students are provided with online module notes and readings as well as assignments being submitted online. Emphasis is placed on teaching students practical software applications skills relevant to industry needs.
Level: Postgraduate Coursework Level 7 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7028 Engineering Project 1 (PG) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7028/) Legacy Code: 301395
This subject introduces the professional engineering skills necessary to practice as an engineer, including project management, professional communication, professional ethics and legal obligations. Students are required to conduct a critical literature survey on a relevant area, identify the design or research problems, propose a plan and methodology for the design or research problems, conduct some preliminary work and analysis, present their work, and complete a project proposal and a project report.
Level: Postgraduate Coursework Level 7 subject
Co-requisite(s): ENGR 7013 - Industrial Experience (PG)
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 7029 Engineering Project 2 (PG) (20 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr7029/) Legacy Code: 301396
This subject is a continuation of subject Engineering Project 1 (PG). Students will further develop their professional skills in engineering design, research, and presentation. This will be achieved through the independent work on the proposed engineering design or research topic under an academic supervisor. Students are required to employ the identified design plan or research methodologies to carry out the proposed design or research work, fulfil the design or research objectives, evaluate and analyse the results, and present the results and findings in an oral presentation, a research paper and a final project report. This subject will demonstrate students' professional level of conducting an engineering project.
Level: Postgraduate Coursework Level 7 subject
Pre-requisite(s): ENGR 7028
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 9001 Higher Degree Research Thesis - Engineering (80 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr9001/) Legacy Code: 800179
Level: PhD and Research Masters Level 9 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 9002 Higher Degree Research Thesis - Engineering (80 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr9002/) Legacy Code: 800202
Level: PhD and Research Masters Level 9 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject

ENGR 9003 Higher Degree Research Thesis - Engineering (Environmental) (80 Credit Points)
Subject Details (https://hbook.westernsydney.edu.au/subject-details/engr9003/) Legacy Code: 800061
Level: PhD and Research Masters Level 9 subject
Restrictions: Please see the Subject Details page for any restrictions for this subject