

DIPLOMA OF ENGINEERING

Program Information

The Diploma of Engineering provides foundation knowledge in mathematics, an understanding of engineering practices, and specialised topics in civil, electrical, mechanical and mechatronic engineering, enabling students to pursue engineering degrees at the University of South Australia.

Stage 1			Study Load	Units
ESS001	Essential Study Skills		25%	4.5
ITN002	Information and New Media Technologies		25%	4.5
ADM001	Advanced Mathematics 1	(Pre-requisite for ADM002)	25%	4.5
PHY001	Physics 1	(Pre-requisite for MENG1012)	25%	4.5
CPP002	Communication: People Place and Culture		25%	4.5
ARC002	Academic Research and Critical Enquiry		25%	4.5
ADM002	Advanced Mathematics 2	(Pre-requisite for MATH1063)	25%	4.5
PHY002	Physics 2	(Pre-requisite for EEET1025)	25%	4.5
Stage 2			Study Load	Units
MATH1063	Mathematical Methods for Engineers 1	(Pre-requisite for MATH1064)	25%	4.5
COMP1036	Computer Techniques		25%	4.5
ENGG1003	Sustainable Engineering Practice		25%	4.5
ENGG1004	Engineering Design and Innovation		25%	4.5
MATH1064	Mathematical Methods for Engineers 2		25%	4.5
EEET1026	Introduction to Computer Systems * (Not offered every trimester)	ELE / TRO Only	25%	4.5
PHYS2011	Engineering Physics * (Not offered every trimester)	ELE Only	25%	4.5
MENG1012	Engineering Mechanics	CIV / MEC / TRO Only	25%	4.5
EEET1025	Electricity and Electronics	ELE / MEC / TRO Only	25%	4.5
RENG1005	Engineering Materials	CIV / MEC Only	25%	4.5
BUSS2068	Management and Organisation	CIV Only	25%	4.5

Civil (CIV)	Electrical (ELE)	Mechanical (MEC)	Mechatronic (TRO)
Bachelor of Engineering (Civil, Civil and Structural, Civil and Project Management) Bachelor of Environmental Science	Bachelor of Engineering (Electrical and Electronic, Electrical and Mechatronic) Bachelor of Science Bachelor of Mathematical Sciences Bachelor of Aviation (Stage 1)	Bachelor of Engineering (Mechanical, Mechanical and Advanced Manufacturing, Mechanical and Mechatronic)	Bachelor of Engineering (Mechatronics)

Program Outline

Stage 1 Core Courses

Essential Study Skills

In this course students will be provided with an understanding and application of essential study skills, covering independent learning skills and styles, active listening, presentation and group work skills.

Information and New Media Technologies

You will be introduced to the use of the Internet, social media and associated technologies in society and business. Through the course, you will utilise Microsoft Office along with online tools for effective communication and discuss the ethical and security issues related to the use of Information Communication Technologies.

Advanced Mathematics 1

In this course you will gain a good understanding of calculus required for further studies. You will use algebra to solve mathematical problems involving functions and trigonometry, and gain an introduction to differential calculus.

Physics 1

In this course you are introduced to the basic concepts of Physics, with a particular focus on motion and heat. You will learn appropriate equations and units for demonstrating different concepts and conduct experiments to analyse and test theories.

Communication, People, Place and Culture

In this unit you are introduced to the basic principles of communication and its role in society and culture. You will investigate the effects of different forms of verbal and non-verbal communication and describe cultural influences on the communication process.

Academic Research and Critical Enquiry

This course will introduce you to the basic principles of critical thinking. It also assists you in developing skills needed for the tertiary study environment, including academic reading, listening and note-taking, as well as written formats and referencing.

Advanced Mathematics 2

This course further develops your capabilities in calculus to prepare you for the level of mathematics required in Engineering. You will build on your existing algebra knowledge to solve mathematical problems including trigonometric, exponential and logarithmic equations.

Pre-requisite: Advanced Mathematics 1

Physics 2

This course further develops your skills in using the basic concepts of Physics to the level required for the study of engineering focusing on waves, optics, electricity and atomic physics. You will continue to develop your analytical skills, using appropriate diagrams as a form of communicating and discussing discrepancies in your results.

Stage 2 Core Courses

Mathematical Methods for Engineers 1

You will be introduced to mathematical concepts relevant to engineering disciplines using both analytic and software approaches. The course includes topics in calculus, trigonometry, and vectors; in particular functions and their graphs, rates of change and derivatives, and integration techniques.

Pre-requisite: Advanced Mathematics 2

Computer Techniques

The course will provide you with an understanding in the use of computer technology as a tool in visualisation and problem solving, in particular through the use of the C programming language and SolidWorks. You will further develop skills in understanding and producing 3D engineering models and engineering drawings.

Sustainable Engineering Practice

You will be introduced to the role of the professional engineer, characteristics of modern engineering disciplines, critical analyses and reflective practice, principles of sustainable engineering and development; and practice effective teamwork, report writing, and presentations.

Engineering Design and Innovation

In this course you will seek to solve practical engineering design problems and to recognise the roles of systems thinking, innovation and creativity in the design process. Topics include: basic systems engineering concepts, the engineering design process, design concepts, creativity, innovation and entrepreneurship, test and evaluation processes, and project management principles.

Mathematical Methods for Engineers 2

This course extends mathematical problems solving introduced in Mathematical Methods for Engineers 1. You will cover inverse trigonometric functions, exponential and logarithmic functions, partial derivatives, convergence of infinite series and linear first and second order differential equations.

Pre-requisite: Mathematics Methods for Eng. 1

Stage 2 Stream Courses

You must complete all three courses from your chosen stream

Introduction to Computer Systems

This course will develop your knowledge and understanding of the fundamentals of computer systems, including number systems and codes, Boolean functions, logic operations and logic gates.

Engineering Physics

This course extends your knowledge and understanding of the basic laws, principles and concepts of modern physics and their practical applications through topics in optics, electromagnetism, and quantum and atomic physics.

Engineering Mechanics

This course provides foundational knowledge of Statics and a basic understanding of Dynamics to prepare students to design, model and analyse structural and mechanical systems. You will develop problem-solving skills to model and analyse; forces, moments and their effects on the equilibrium state of particles, rigid bodies and structural members.

Pre-requisite: Physics 1

Electricity and Electronics

This course will introduce you to the concepts, applications, basic analysis and measurements in electrical and electronic systems. Topics include electrical components and circuits, AC and DC fundamentals, computer based instrument systems, analogue to digital conversion, and electrical power systems.

Pre-requisite: Physics 2

Engineering Materials

The course will introduce you the properties, testing, performance, manufacture and selection of materials in engineering. The course covers the structure and properties of materials, and examines the atomic structure, bonding, micro and macro structures and crystals. It explores the mechanical, electrical and physical properties of materials and investigates the types, properties and strengthening mechanisms of metals and alloys. Additionally, the types and characteristics of polymers, ceramics and composites are studied.

Management and Organisation

Organisations operate in a turbulent environment driven by a number of forces such as globalisation, intense competition and rapid technological change. This course is designed to provide you with a basic understanding of the nature of management, work and its organisation in the modern world. It provides you with an opportunity to analyse and explain the changing nature of work, and how work is organised and managed at various levels within organisations.