Diploma of Engineering

Course Codes: 1994: Diploma of Engineering Fast Track (Domestic)
2902: Diploma of Engineering Fast Track (International)
(CRICOS Code: 0101924)

Year of issue: 2025

Course Outline

Contents

Diploma of Engineering Fast Track Course Outline

1   Course Description

The UOW College Australia (UOWCA) Diploma of Engineering Fast Track provides a program of study involving students in first year core engineering subjects, but with additional levels of support which enhance their opportunity to succeed. The classes include the study of theoretical and practical units, and hands-on experience in the area of engineering. Students are provided with dedicated support tutorials to prepare them for success in their university studies.

Successful completion of the Diploma of Engineering Fast Track provides students with entry into the second year of Bachelor of Engineering in the Faculty of Engineering and Information Sciences at the University of Wollongong (UOW). The course also provides students with a broad educational and skills base as preparation for a variety of entry level positions in industries and businesses requiring engineering knowledge and aptitudes.

Diploma qualifications are located at level 5 of the Australian Qualifications Framework. The purpose of the Diploma qualification type is to qualify individuals who apply integrated technical and theoretical concepts in a broad range of contexts to undertake advanced skilled or paraprofessional work and as a pathway for further learning.

2 Graduate Qualities

The Diploma of Engineering Fast Track course is designed to assist students in developing the UOW College Graduate Qualities. It helps students become:

1. **Informed**: Have a basic knowledge of an area of study and understand its issues. Know how to apply this knowledge.

2. **Independent Learners:** Begin to engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing enquiry and active learning. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.

3. **Problem Solvers:** Demonstrate introductory levels of creative, logical and critical thinking skills to respond effectively to problems. Be flexible and thorough.

4. **Effective Communicators**: Articulate and convey ideas effectively using a range of media. Work collaboratively and engage with people in different settings.

5. **Responsible:** Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity and act with integrity. Take responsibility for one's own learning and completion of assessment tasks.

3 Course Learning Outcomes

Graduates will be able to:

1. Demonstrate an understanding of ethical behaviour in the engineering environment.

2. Utilise Information and Communication Technologies (ICT), including the use of industry-standard applications and modern library facilities.

3. Develop simple solutions to a broad range of engineering problems, both theoretical and practical.

4. Effectively employ a range of communication strategies - oral, written, systems documentation.

5. Operate effectively as a member of a team in a study environment or a simulated workplace environment.

6. Identify, gather, retrieve, evaluate and operate on textual, graphical and numerical information as applied to the study and practice of engineering.

7. Apply critical thinking, analysing and problem-solving skills appropriately in various study and practical settings.

8. Demonstrate the academic literacy requirements for successful completion of an undergraduate university course.

4 Course Learning Outcomes Mapped to Graduate Qualities

The table below shows how the graduate qualities are integrated into the course learning outcomes:

Course Learning Outcomes/Graduate Qualities	1. Informed	2. Independent Learners	3. Problem Solvers	4. Effective Communicators	5. Responsible
1. Demonstrate an understanding of ethical behaviour in the engineering environment.	✓				✓
2. Utilise Information and Communication Technologies (ICT), including the use of industry-standard applications and modern library facilities.		✓			
3. Develop simple solutions to a broad range of engineering problems, both theoretical and practical.			✓		
4. Effectively employ a range of communication strategies - oral, written, systems documentation.				✓	
5. Operate effectively as a member of a team in a study environment or a simulated workplace environment.					✓
6. Identify, gather, retrieve, evaluate and operate on textual, graphical and numerical information as applied to the study and practice of engineering.	✓	✓			

Course Learning Outcomes/Graduate Qualities	1. Informed	2. Independent Learners	3. Problem Solvers	4. Effective Communicators	5. Responsible
7. Apply critical thinking, analysing and problem-solving skills appropriately in various study and practical settings.			✓		
8. Demonstrate the academic literacy requirements for successful completion of an undergraduate university course.		✓		✓	

5   Course Structure and Subjects

1994: DIPLOMA OF ENGINEERING FAST TRACK (Domestic)
2902: DIPLOMA OF ENGINEERING FAST TRACK (International)

SESSION 1: UOW Autumn Dates			
Subject Code	**Subject Name** *(UOW Equivalent Subject Code)*	**Credit Points**	**Contact Hours a Week**
DPEN102	Fundamentals of Engineering Mechanics *(ENGG102)*	6	6
DPEN103	Materials in Design *(ENGG103)*	6	6
DPEN105	Engineering Design for Sustainability *(ENGG105)*	6	6
DPEN141^	Foundations of Engineering Mathematics *(MATH141)*	6	6
Total Session 1		**24**	**24**

SESSION 2: UOW Spring Dates			
Subject Code	**Subject Name** *(UOW Equivalent Subject Code)*	**Credit Points**	**Contact Hours a Week**
DPEN100	Engineering Computing and Analysis *(ENGG100)*	6	6
DPEN104	Electrical Systems *(ENGG104)*	6	6
DPEN142^	Essentials of Engineering Mathematics *(MATH142)*	6	6
DPEN143	Physics for Engineers *(PHYS143)*	6	6
Total Session 2		**24**	**24**

^DPEN141 Foundations of Engineering Mathematics is a pre-requisite for DPEN142 Essentials of Engineering Mathematics. Students cannot enrol in DPEN142 unless they pass DPEN141 with a minimum result of 50%.

Expected Course Workload

As a guide, the workload for your course is determined by the number of subjects you take each session. Attempting four subjects in a standard session is considered to be a fulltime load i.e. equivalent to working fulltime (35-45hrs a week).

Each subject in this course has designated contact hours where you are required to attend classes including lectures, tutorials, workshops or other structured learning experiences.

To be successful in this course you are also required to undertake independent learning activities outside of your scheduled classes, this includes:

- Preparing for classes: homework, readings and reviewing learning materials.
- Independently researching and/or practicing knowledge and skills.
- Completing all assessment tasks and studying for examinations.
- Attending learning support services.

6 Subjects Mapped to Course Learning Outcomes

Subject/Course Learning Outcomes	1. Demonstrate an understanding of ethical behaviour in the engineering environment.	2. Utilise Information and Communication Technologies (ICT), including the use of industry-standard applications and modern library facilities.	3. Develop simple solutions to a broad range of engineering problems, both theoretical and practical.	4. Effectively employ a range of communication strategies - oral, written, systems documentation.	5. Operate effectively as a member of a team in a study environment or a simulated workplace environment.	6. Identify, gather, retrieve, evaluate and operate on textual, graphical and numerical information as applied to the study and practice of engineering.	7. Apply critical thinking, analysing and problem-solving skills appropriately in various study and practical settings.	8. Demonstrate the academic literacy requirements for successful completion of an undergraduate university course.
DPEN141 Foundations of Engineering Mathematics				✓	✓	✓	✓	
DPEN142 Essentials of Engineering Mathematics				✓	✓	✓	✓	
DPEN143 Physics for Engineers	✓	✓	✓		✓	✓	✓	
DPEN100 Engineering Computing and Analysis		✓	✓	✓	✓	✓	✓	
DPEN105 Engineering Design for Sustainability	✓	✓	✓	✓	✓	✓	✓	✓
DPEN102 Fundamentals of Engineering Mechanics				✓	✓	✓	✓	✓

Subject/Course Learning Outcomes	1. Demonstrate an understanding of ethical behaviour in the engineering environment.	2. Utilise Information and Communication Technologies (ICT), including the use of industry-standard applications and modern library facilities.	3. Develop simple solutions to a broad range of engineering problems, both theoretical and practical.	4. Effectively employ a range of communication strategies - oral, written, systems documentation.	5. Operate effectively as a member of a team in a study environment or a simulated workplace environment.	6. Identify, gather, retrieve, evaluate and operate on textual, graphical and numerical information as applied to the study and practice of engineering.	7. Apply critical thinking, analysing and problem-solving skills appropriately in various study and practical settings.	8. Demonstrate the academic literacy requirements for successful completion of an undergraduate university course.
DPEN103 Materials in Design	✓		✓	✓	✓	✓	✓	
DPEN104 Electrical Systems		✓	✓		✓	✓	✓	

7   Progression Guidelines

Course Progression Requirements

1. To qualify for the award of the Diploma of Engineering, students must achieve a minimum result of 50% for each subject in the Diploma.

2. Students who meet the requirements for the award of the Diploma can progress to the second year of the Bachelor of Engineering (Honours) in the Faculty of Engineering and Information Sciences with 48 points of UOW credit transfer. Please refer to the Credit transfer arrangements page for more detailed information - https://www.uowcollege.edu.au/courses-pathways/admissions-information/credit-transfer-arrangements/

3. DPEN141 Foundations of Engineering Mathematics is a pre-requisite for DPEN142 Essentials of Engineering Mathematics. Students cannot enrol in DPEN142 unless they pass DPEN141 with a minimum result of 50%.

4. Students may exit the Diploma course early and enter the Bachelor of Engineering (Honours) with 36 or 42 points of UOW credit transfer ('Early Exit – Incomplete Award'), if they have achieved the following conditions:

   i. Students must be on Active Status to exit the Diploma. Students who are not on Active status must successfully complete the Diploma in full to progress to UOW.

   Note: Where a student has opted for Early Exit – Incomplete Award, they will not be eligible for the Diploma award until they successfully complete the outstanding equivalent subjects in their UOW degree. Once a student has completed the equivalent subjects at UOW, the student can submit an Application for Credit for Prior Learning directly to UOW College for the Diploma qualification to be awarded.

8 Entry Requirements / Admissions Guidelines

Entry requirements for this course can be viewed online. See the 1994 Diploma of Engineering Fast Track (International) at:
 https://coursefinder.uow.edu.au/information/index.html?course=diploma-engineering-two-session-csp

See the 2902 Diploma of Engineering Fast Track (International) at:
https://coursefinder.uow.edu.au/information/index.html?course=diploma-engineering-uow-college-2-session

9 Assessment

Students are required to complete a number and variety of assessment tasks related to their streams of study.

Each subject has a subject outline that is issued to students. Subject outlines contain an overview of subject objectives, an assessment schedule, a list of learning resources and a weekly topic outline. Subject outlines also contain an explanation of assessment components.

All assessment tasks with a weighting of 10% or greater have marking criteria and an answer/marking guide.

All aspects of assessment are governed by Policy, Procedures and Guidelines, which can be viewed at: https://www.uowcollege.edu.au/support-resources/policies-procedures/

10 Quality Assurance

The College applies formal quality assurance processes to its design of courses, subjects and their assessments. These processes include:

- Clear subject outlines that align with the objectives of the course and support consistent delivery of content;

- Mandatory inclusion of clear and appropriate marking criteria in assessment tasks;

- Moderation of marking of student assessment tasks, ensuring that the assessment criteria have been applied consistently and there is equity across individual markers;

- A regular schedule of audits on student assessment tasks using randomly-selected samples of student work; and

- The use of feedback from students and teachers to inform continuous improvement of curriculum, delivery, policies and procedures.

11 Subject Descriptions

DPEN141 Foundations of Engineering Mathematics

This subject consists of two strands, Calculus and Linear Algebra. The Calculus strand covers differential calculus and provides an introduction to integral calculus. The Linear Algebra strand covers matrices, determinants and applications of these in the sub-topic of vector geometry. All of these are presented with accompanying examples from various engineering disciplines.

DPEN142 Essentials of Engineering Mathematics

This subject consists of two strands, Integral Calculus with applications and Series. The Integral Calculus strand presents a number of analytical and numerical integration techniques plus applications of integration to find areas, volumes of revolution and solve differential equations. The Series strand covers techniques for finding limits, determining the convergence of series and leads into Taylor series. All of these are presented with accompanying examples from various Engineering disciplines.

DPEN143 Physics for Engineers

This subject covers vectors and their applications, and an introduction to the physical laws of electricity and magnetism, leading to an explanation of the generation of electromagnetic waves and some basic ideas in communication theory. It addresses electric charge and Coulomb's law, electric fields, potential differences, capacitance, dielectrics and relative permittivity, electric current, resistance, Ohm's 'law', superconductivity, DC circuits and Kirchhoffs laws, magnetic fields and forces, electromagnetic waves and the EM spectrum, carrier waves, modulation and bandwidth. It covers waves; reflection and refraction; interference; diffraction; polarization; optical instruments; quantum physics; waves and particles; atomic physics; and the Bohr atom.

DPEN100 Engineering Computing and Analysis

This subject teaches algorithm design and computer programming using MATLAB. Students will develop a systematic approach to analyse engineering problems and create algorithms that solve real-world problems. Topics include: problem-solving techniques; algorithm design; data types and operators; conditional and repetitive control flow; file access; functions; data visualisation; code optimisation; arrays/matrices; and vectorisation. Students will also focus on computational tools to solve engineering problems such as kinematics of rectilinear and curvilinear motion.

DPEN105 Engineering Design for Sustainability

In this subject, students draw together engineering principles covered in other subjects to develop context-appropriate solutions to engineering challenges. Students will work in teams undertaking investigation, concept development, and detailed design that demonstrate innovative and creative thinking. Students must consider the technical, social, economic and environmental aspects of a design problem to produce solutions that are likely to be workable in the real world.

DPEN102 Fundamentals of Engineering Mechanics

In this subject, students explore fundamental laws of motion and their application to the analysis and design of simple structures. Students will undertake a series of design and build projects to see the effects of concepts of mechanics in real structures. Working in design teams, students will also explore the professional responsibilities of engineers in terms of accountability, liability and sound design and analysis techniques.

DPEN103 Materials in Design

In this subject, students explore the interrelationships between materials structure, properties, processing, application and lifecycle. Students will apply materials science and lifecycle analysis to develop solutions to engineering problem that are optimised for sustainability. Students must consider both economic and environmental impact in the identification and selection of appropriate materials in engineering design.

DPEN104 Electrical Systems

This subject provides an introduction to real-world electrical systems. The subject teaches fundamental electrical concepts: change, current, voltage, resistance, capacitance, inductance, energy and power. The subject introduces theorems to simplify AC and DC circuits through analysis and simulation. The subject also links the fundamental concepts to practical engineering applications such as motors and generators. The laboratory component covers measurements using electrical components and equipment, designing basic circuits, as well as report writing.

WUCB130 Introduction to Management

This subject will introduce students to key management theories and concepts including organisational culture, social responsibility, ethics, managing groups, motivating employees, planning, managing human resources and employment relations, strategic management, decision-making, managing operations, leadership and foundations of management control. The subject is designed to provide an opportunity for students to acquire understanding through a series of lectures supported by student participation in simulation activities. The subject is presented from the point of view of managers, but students will learn how the different interests between organisational stakeholders affect various management processes.

12 Version Control Table

Version Control	Date Effective	Approved By	Amendment
2020_1.0	12/09/2019	UOWCA Academic Board	Initial release – 2020 delivery
2020_1.1	13/01/2020	UOWCA General Manager	Amendment to DENG007 subject title, from *Engineering Analysis and Computing* to *Engineering Computing and Analysis*
2020_1.2	27/02/2020	UOWCA General Manager	Insertion of new CRICOS code for TEQSA-accredited course
2022_1.0	09/09/2021	Academic Board	Replace DENG subject codes with DPEN subject codes for 2022 delivery; Course title amended to include 'Fast Track'.
2023_1.0	01/12/2022	College Education Committee	Update to subject schedule. New release 2023
2024_1.0	01/12/2023	No Change	New release 2024
2024_1.2	30/5/2024	Program Manager Academic	Removal of elective DPEN103 Materials in Design.
2024_1.3	25/06/2024	Program Manager Academic	Update to the URL links
2024_1.4	2/10/2024	Program Manager Academic	Administrative amendment only
2025_1.0	3/01/2025	Program Manager Academic	New release 2025