Diploma of Engineering

COURSE OUTLINE
Charles Darwin University’s (CDU) Diploma of Engineering is ideal for students who wish to study engineering at an introductory level.

It provides basic technical skills whereby graduates can commence entry level work in engineering related areas, or go on to further their studies in engineering. A solid grounding in mathematics and sciences is provided along with a general engineering foundation.

Successful completion of this diploma will enable entry into the second year of CDU’s Bachelor of Engineering course.

As well as having the necessary technical skills, course graduates will be prepared for their careers through a strong emphasis on professional skills, such as leadership, communication, problem solving, innovation and interpersonal relationships.

We invite you to join us and be part of the unique learning experience of CDU.

GRADUATE OUTCOMES
CDU engineering graduates are highly sought after. The course has been developed and maintained in conjunction with industry to meet current engineering needs. Continuous economic development in the Northern Territory has created a strong demand for engineering graduates.
COURSE STRUCTURE

CORE UNITS (7)
Design and Innovation (S1, S2, SS)
This unit is an introduction to design and creative thinking: technical, environmental and economic evaluation of design, aesthetics of design, cultural aspects of design, legal factors, tropical considerations in design, working in groups, decision making and public presentations.

Statics (S1)
This unit introduces the basic concepts of statics including: force vectors, equilibrium of a particle, force system resultants, equilibrium of a rigid body, basic structural analysis, internal forces, friction, screw threads, centre of gravity and centroid, moments of inertia, and virtual work.

Introduction to Mathematics (S1)
This unit covers a range of topics in algebra and calculus including: number systems, mathematical induction, vectors, systems of equations, matrices, determinants, complex numbers, functions, limits, continuity, differentiation, maxima and minima, curve sketching, integration, logarithm and exponential functions, mean value theorem and l'Hopital's rule.

Electrical Engineering (S2)
This unit deals with a range of electrical engineering and computing concepts including: resistive circuits, inductance and capacitance, transients, steady-state analysis, magnetic circuits and transformers, DC and AC machines, diodes, transistors and operational amplifiers and logic circuits.

Concepts of Physics (S2)
This unit introduces conservation principles of physics, energy and momentum, scaling laws, particle motion, gravity and tidal effects, waves, fluid flow, diffusion, thermodynamics and energy transfer in physical processes such as radiation and evaporation. Other topics include: the nature of electric and magnetic fields, the basics of electric currents, resistors and capacitors, electromagnetic waves and the electromagnetic spectrum, physical and geometric optics, modern physics, atomic structure, radioactive decay and applications.

Concepts of Chemical Engineering (S2)
This unit provides an understanding of the science and engineering science principles underlying process engineering: unit processes, mass and energy balances, heat exchange, thermodynamics, entropy and equilibrium, heat engines, refrigeration, chemical reaction engineering and process dynamics.

Cultural Intelligence and Capability (CUC107) (S1, S2, SS)
Cultural Intelligence and Capability explores important issues related to living, studying and working as a professional in the diverse social and cultural environments of contemporary society. The unit examines broad interactions between culture, knowledge experience and behaviour and the way in which these interactions and our perceptions of culture shape our interactions at a personal, academic and professional level.

ELECTIVE UNITS (CHOICE OF 1)
Chemical Concepts (S1)*
This unit is designed to give students a thorough and broad understanding of modern chemistry. It involves chemical concepts like gas laws, thermo-chemistry, atomic structure, chemical bonding leading to shapes of molecules, behaviour of solids, liquids and solutions, chemical kinetics and chemical equilibrium involved in acids, bases and solubility.

Surveying and Construction (S1)*
This unit is an introduction to surveying and elementary construction techniques for civil engineering.

Digital Electronics and Computer Architecture (S1)
This unit gives an overview of digital systems, elementary computer hardware and the programming of computers using assembler.

Manufacturing (S1)*
This unit gives an overview of a range of manufacturing techniques for mechanical engineering applications.

Engineering Foundations (S1)*
This unit covers material properties and applications for civil and mechanical engineering.

Mathematics 1A (S1)
This unit covers differential calculus and introduction to integral calculus, number systems, the fundamentals of linear algebra and matrix algebra, complex numbers and vectors, inequalities and absolute value and the principle of mathematical induction.

Dynamics (S2)*
This unit deals with dynamics of particles and bodies.

Project Management (S2)
This unit covers formalised project management techniques for successful completion of engineering projects.

S1 = Semester 1, commencing March
S2 = Semester 2, commencing July
SS = Summer Semester, commencing November

*RESIDENTIAL SESSIONS REQUIRED FOR DISTANCE LEARNING
The Diploma of Engineering is available externally by distance learning, but on-campus residential activity is required for selected units as indicated.