

# DIPLOMA OF SCIENCE (ENGINEERING STUDIES) (YEAR 2)

This program is specially designed for students wishing to enrol in the wide range of programs offered by ECU's School of Engineering. ECU Engineering programs are structured heavily around practical learning; you will have the opportunity to work with real hardware, not just simulation packages. Teaching facilities include advanced laboratories with modern industry-standard equipment. This program is taught on ECU's state-of-the-art ECU Joondalup Campus West.

The program consists of 8 units of study and can be completed over 2 or 3 trimesters. Students who complete the Diploma of Science (Engineering Studies) (Year 2) at ECC will receive up to 8 units (120 credit points) advanced standing, the equivalent of the first year, in the respective Bachelor degree at ECU. A minimum of 50 percent pass in all units is required for progression to ECU.

## UNIT DESCRIPTORS

### **ENM1102D – Engineering Drawing and Computer Aided Design (CAD)**

This unit introduces students to technical drawing and the use of computer-aided design tools. Students will progress from hand drawings which meet relevant Australian standards to the use of computer-aided design tools for engineering drawings.

### **ENS1115D – Materials and Manufacturing**

This unit develops students' knowledge of common engineering materials and enables them to select materials based on their inherent properties and to develop a direct link between the structure and mechanical behaviour of materials.

### **MAT1250D – Mathematics 1** (Prerequisite: Year 12 Calculus, MAT137 – Introductory Applied Maths or equivalent)

This unit deals with complex numbers, functions of two variables and their derivatives, differentiation of hyperbolic, inverse trigonometric and reciprocal trigonometric functions, related rates problems, integration techniques and their application to

solve volume and length problems, the solution of first and second order differential equations and their application to applied problems.

### **ENS1154D – Introduction to Engineering**

This unit introduces students to the discipline and practice of professional engineering. The role of engineers and some of the important concepts that characterise the engineering approach to solving technical problems are described. In addition, the importance of appropriate communication and the management aspects of engineering are introduced. The unit includes a group design project that takes the student through the engineering design process from client specification, around an iterative design loop, to a fully documented final solution.

### **MAT1251D – Mathematics 2** (Prerequisite: Year 12 Maths Methods, MAT137 – Introductory Applied Maths or equivalent)

This unit introduces linear algebra, operations research, probability, and their application to problems arising in applied contexts. Students will be introduced to the vectors, matrices, the solution of linear systems of equations, the formulation and solution of linear

programming problems, network optimisation, continuous probability distributions and reliability analysis.

### **ENS1253D – Electrical Engineering 1B**

This unit introduces a range of concepts that are fundamental to the fields of electrical and electronic engineering. Students will develop their conceptual and analytical understanding of electrical circuits and systems through lectures, tutorials and laboratory work.

### **ENS1180D – Introduction to Energy and Resource Engineering**

This unit provides an introduction to the concepts of energy and resources, including resource estimation and extraction, and the conversion and use of energy resources for supporting domestic, commercial and industrial needs. The units covers principles of sustainable energy and resource use, energy sources, resource extraction and energy conversion, transmission and utilisation; and the associated economic costs and benefits, and environmental impacts. The design of simple energy systems is introduced together with their all-of-life costs and benefits using computer-based modelling tools.

## Diploma of Science (Engineering Studies) (Year 2) continued

### ENS1101D – Engineering Mechanics

(Prerequisite: Year 12 Physics or PHY100 or equivalent AND Year 12 Mathematics MAT 3C/3D or MAT137 or equivalent Calculus subject)

This unit covers principles of engineering mechanics with a focus primarily on statics and application of these principles to problems related to engineering structures and systems. Students draw free-body diagrams to describe structural elements/systems; and use principles of statics to resolve forces and movements in engineering systems.

### PHY100 – Introductory Physics (not for credit)

This unit is designed to provide students with knowledge in a broad range of physics concepts, and to help students identify the impact of physics and technology on society. It is designed for those who do not have a physics background at secondary level but wish to study engineering or physical sciences at the university. This unit covers theory and practical investigations, using logical and analytical thinking, as well as developing skills in communicating scientific information. Physics principles and methods applicable to Newton's Laws, forces, heat, motion, electricity, wave motion and optics are included.

### MAT137 – Introductory Applied Maths (not for credit)

This unit introduces students to functions, calculus, descriptive statistics, probability and random variables, and their application to solve applied problems. Students will be introduced to functions and their properties, differential and integral calculus and its application to optimisation, area and rectilinear motion problems, arithmetic and geometric sequences, sets and probability, descriptive statistics and discrete and continuous random variables.



Compulsory Pre-Requisite Units (for those without relevant Year 12 equivalent background)	Students will complete the units below:	Entry into ECU Year 2
PHY100 – Introductory Physics This unit is for students who do not have the Physics pre-requisite (background) for ENS1101D - Engineering Mechanics. Passing PHY100 does not qualify for any unit exemption at ECU.	ENM1102D - Engineering Drawing & Computer Aided Design (CAD)	<ul style="list-style-type: none"> <li>• <b>Bachelor of Aviation</b></li> <li>• <b>Bachelor of Engineering Honours – 8 units (120 credits points)</b> majors in: Civil, Civil and Environmental, Computer Systems, Electrical Power, Electrical and Renewable Energy, Electronics and Communications, Instrumentation Control and Automation, Mechanical, Mechatronics, Petroleum</li> <li>• <b>Bachelor of Engineering Science – 8 units (120 credit points)</b></li> <li>• <b>Bachelor of Technology (Aeronautical) – 8 units (120 credit points)</b></li> <li>• <b>Bachelor of Technology (Engineering) – 8 units (120 credit points)</b> majors in: Chemical, Electronics and Communications</li> <li>• <b>Bachelor of Technology (Motorsports) – 8 units (120 credit points)</b></li> </ul>
	ENS1115D – Materials and Manufacturing	
	MAT1250D – Mathematics 1	
MAT137 – Introductory Applied Maths This unit is for students who do not have the sufficient background in Calculus (Year 12 or equivalent). Students must pass MAT137 before enrolling in Mathematics and Engineering Mechanics. Passing MAT137 does not qualify for any unit exemption at ECU.	ENS1154D - Introduction to Engineering	
	MAT1251D – Mathematics 2	
	ENS1253D - Electrical Engineering 1B	
International students must study a full-time study load.  ECC reserves the right to cancel classes due to insufficient demand. Timetable clashes may be unavoidable.	ENS1180D - Introduction to Energy and Resource Engineering	
	ENS1101D - Engineering Mechanics	

**Methods of assessment at ECC** may differ depending on the program and subjects you choose. Most subjects will be assessed through a combination of written examinations and assignments, essays, presentations, seminars and tutorial participation. Some coursework will include group-based projects and practical activities. At the beginning of each unit, students are given an outline that includes due dates for the completion of assignments. Students who fail to meet these submission deadlines may be penalised even though the work was completed. Attending all classes is essential in order to be successful at ECC. **Flyer is current as of 14 October 2021.**

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