Diploma of Engineering - Course Guide

	Fast Track (Completing In 8 months/2 trimesters)			
	COMPULSORY ONLINE SUBJECT **(must be completed in the first trimester)** LTM1AIM - Academic Integrity Module			
YEAR 1 (DIPLOMA)	**Trimester 1**	**ECSE1CES (Core)** Programming for Engineers and Scientists	**EEMS1CAD (Core)** Engineering CAD	**EMAT1CDE (Core)** Calculus and Differential Equations	**EPHY1SCA (Core)** Principles of Physics A
	Trimester 2	**EEMS1EDP (Core)** Engineering Design and Problem Solving	**EEMS1MS (Core)** Mechanics of Solids	**ELE1IEL (Core)** Introduction to Electrical and Electronic Engineering	**EMAT1NLA (Core)** Number Systems and Linear Algebra

	Normal Track (Completing course in 12 months/ 3 Trimesters)			
	COMPULSORY ONLINE SUBJECT **(must be completed in the first trimester)** LTM1AIM - Academic Integrity Module			
YEAR 1 (DIPLOMA)	**Trimester 1**	**ECSE1CES (Core)** Programming for Engineers and Scientists	**EEMS1EDP (Core)** Engineering Design and Problem Solving	**EMAT1NLA (Core)** Number Systems and Linear Algebra
	Trimester 2	**EEMS1CAD (Core)** Engineering CAD	**EMAT1CDE (Core)** Calculus and Differential Equations	**EPHY1SCA (Core)** Principles of Physics A
	Trimester 3	**ELE1IEL (Core)** Introduction to Electrical and Electronic Engineering	**EEMS1MS (Core)** Mechanics of Solids	

After completing diploma with required WAM students gain entry into second year of:

- Bachelor of Engineering Honours (Industrial), WAM 60
- Bachelor of Civil Engineering (Honours), WAM 60
- Bachelor of Science (Maths major), WAM 50

Weighted Average Mark (WAM) is calculated from all attempts at passing a subject, including fails.

Subject Descriptions

LTM1AIM Academic Integrity Module
(online, zero credit point unit, all students must complete this unit in their first trimester)

This subject introduces students to the principals of academic integrity in the context of La Trobe University's values and policy. Students learn what their responsibilities are in relation to maintaining ethical standards in all aspects of academic work and the potential ramifications for academic misconduct according to the Academic Integrity Policy. Activities and quizzes are provided, which are designed to develop and understanding of the concepts of cheating, plagiarism and collusion. Topics include an explaining of how the text-matching tool 'Turnitin" is used at La Trobe, and where to get help and where to go to develop referencing skills.

Assessment: Final Quiz (must achieve 8/10 to pass), Statement of Student responsibility (must achieve 10/10 to pass)

ECSE1CES C Programming for Engineers and Scientists

This subject is an introduction to procedural programming using the C programming language. Topics include the C Compiler and pre-processor, functions and programme structures, pointers and arrays, structures, input/output and the UNIX interface.

Assessment: Weekly computer labs and quizzes (20%), Programming assignments (30%), Final written exam (50%)

EELE1IEL Introduction to Electrical and Electronic Engineering

This introductory subject assumes no prior knowledge of electronics. The unit consists of two components: DC and AC Circuit Analysis. The first component introduces elementary circuit analysis techniques and applies them to DC circuits. The second component extends these analysis techniques and applies them to AC circuits. At the end of the subject, students will be familiar with: circuit theory, sinusoidal and non-sinusoidal waveforms, phasors, impedance, network theorems, measurement systems, instruments and DC/AC applications.

Assessment: Weekly written tests (70%), Lab reports (15%), Quizzes (15%)

EEMS1CAD Computer Aided Design

Computer Aided Design (CAD) encompasses a variety of computer tools which enable engineers to design, simulate and model an engineered product. In addition, quite often the person that designs an object is not the same as the one that builds/manufactures it. Therefore, CAD drawings are the tool of communication between the designer and the manufacturer/builder. This subject develops understanding and problem-solving skills necessary to interpret and use CAD tools.

Assessment: Lab tasks (30%), Drawings (30%), CAD tests (40%)

EEMS1EDP Engineering Design and Problem Solving

Engineering is one of the oldest professions and its disciplines encompass a diversity of specialty sub-disciplines. Many engineers are involved in projects and hold supervisory or administrative positions whilst others work in design, construction, research and teaching. Key skills for a successful engineer include: written and oral communication, perception, visualisation, logical reasoning and problem solving; management of oneself, other people, time and equipment. Engineers are capable when working with other people and using mathematics and science in design and problem solving. The subject provides a perspective and exposure to discipline specific engineering practice. Through project-based learning, the student will develop a range of generic skills together with experience in complex problem solving and an appreciation of the complete project cycle.

Assessment: Weekly tasks (50%), Written team report (40%), Oral presentation (10%)

EEMS1MS Mechanics of Solids

A fundamental requirement in the design of many engineering structures is to be able to assess the force interaction between structural elements using the principles of mechanics, and to determine the ability of a structural element to safely resist forces applied to it. This Subject presents the fundamentals of engineering statics and strength of materials.

Assessment: Weekly quizzes (10%), Written tests (20%), Lab (10%), Final written exam (60%)

EMAT1CDE Calculus and Differential Equations

In this subject, students learn and apply mathematical concepts and develop skills that provide a foundation for all studies requiring a knowledge of calculus.

Students refine and extend their knowledge of the concepts and techniques of differentiation and integration and move on to the notions of differential equations and modelling the real world. Techniques for solving first order separable and first and second order linear differential equations are covered together with some approximation techniques. An active learning approach is used engaging students in solving mathematical problems and exploring the detail of mathematical concepts so they can be appropriately applied. Students will develop reasoning skills and the ability to clearly present their written arguments. They are strongly encouraged to practise verbal communication of ideas by working in small groups.

Assessment: Weekly written tests (20%), Online tests (15%), Final written exam (65%)

EMAT1NLA Number Systems and Linear Algebra

In this subject, students learn and apply mathematical concepts and develop skills that provide a foundation for all studies in mathematical sciences. Students review and extend their knowledge of algebra, functions, sets and number systems with significant coverage of complex numbers adding to their repertoire. After consideration of sequences and series, students proceed to a module on Logic and Proof. Students also explore a coherent treatment of vectors and vector geometry that includes matrices and solutions of systems of linear equations via the Gauss-Jordan algorithm, and brief treatment of eigenvalues and eigenvectors. An emphasis is placed on students improving their understanding of mathematical concepts and results so they can be appropriately applied, and development of their reasoning skills and ability to clearly present written arguments, essential in both study and employment.

Assessment: Weekly written tests (20%), Online tests (15%), Final written exam (65%)

EPHY1SCA Principles of Physics A

On completion of this subject, students will be able to solve problems in classical physics (mechanics, thermodynamics and waves) which provide the basis for further study in physics, engineering or another science. They will be able to use the essential apparatus in a physics laboratory to take and analyse measurements, and understand the vocabulary and concepts of classical physics. The topics covered include linear and rotational kinematics and dynamics, thermodynamics, and simple harmonic motion. Students will conduct nine experimental investigations related to these topics.

Assessment: Class tests (15%), Online quizzes (10%), Lab reports (20%), Final written exam (55%)