# Unit Guide

## Diploma of Engineering

Monash College

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# MCD1160 – Introductory Engineering Computing

## Description

This unit will provide grounding in the basic functioning of a computer system and how it is used within the engineering environment. Students' knowledge of the following will be extended: advanced Microsoft Word features, Excel, and PowerPoint. Further, students will learn how to solve real-world problems via the utilisation of a microcontroller and programming language, students will create and execute an effective oral presentation to share their findings.

It is expected that students will investigate, explore and discuss engineering concepts and issues and solve problems in class using computers.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Use the formatting features of a word processor.
2. Use utilities and advanced features provided with a word processor.
3. Create and format a spreadsheet.
4. Use functions and formulas to perform calculations in a spreadsheet.
5. Use graphics in a spreadsheet.
6. Use advanced facilities of a spreadsheet.
7. Designing Power point Slides, incorporating text, graphics and sound, and presentation of information, including the use of bullet points.
8. Designing slide shows, animation of a slide, slide transitions, use of templates & the auto content wizard.
9. Communicate technical content in effective oral presentations.
10. Implement problem solving strategies.
11. Decompose problems into simpler problems.
12. Construct and test simple computer programs.
13. Analyse and debug existing programs.
14. Recognise the importance of good practices in programming.
15. Understand how real-word problems can be addressed by the digital-word.

## Assessments

- Test 1 - 10%
- Test 2 - 10%
- Assignment 1 - 20%
- Presentation 1 - 5%
- Assignment 2 - 30%
- Presentation 2 - 5%
- Lab Participation - 10%
- Weekly Quizzes - 10%
- No Final Examination

# MCD1170 – Introductory Chemistry

## Description

This unit introduces and reinforces the fundamentals of chemistry by exploring physical and organic chemistry using a variety of theoretical and practical techniques.

## Prerequisites

Students should have completed an equivalent to Victorian VCE Year 11 Chemistry, Units 1 & 2.

## Learning Outcomes

On completion of this unit, students should be able to:

1. Express chemical reactions symbolically, qualitatively and quantitatively.
2. Write rate laws and explain how the position of equilibrium can be altered, including examples from industry.
3. Explain the structure and naming of simple organic molecules.
4. Explain the concepts of bonding between atoms and relate this to the properties of compounds.

## Assessments

- Test 1 - 10%
- Test 2 - 10%
- Quizzes (1 – 10) - 10%
- Poster / Presentation - 10%
- Final examination - 60%

# MCD1180 – Introductory Physics

## Description

Physics seeks to describe the fundamental nature of the universe and strives to reveal nature's underlying simplicity and establish the rules which cause galaxies to form, the toast to burn, or what holds the component parts of a proton together. Physics underlies all the life and physical sciences, as well as Engineering and Technology. So this module considers the basic concepts of mechanics, energy, waves and optics. However, physics is not just theories. It relies heavily on mathematics and numerical measurements to test the theories – an aspect students will meet through practical work.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Describe the difference between qualitative and quantitative techniques; record accurate observations.
2. Select measuring equipment of appropriate accuracy.
3. Utilise appropriate numbers of significant figures.
4. Recognise the measurement error in selected equipment; identify sources of error in analytical procedures.
5. Distinguish between displacement, speed, velocity and acceleration.
6. Distinguish between scalar and vector quantities.
7. Apply the laws of motion to practical situations.
8. Demonstrate knowledge of mass, force and their relationship through Newton's laws.
9. Differentiate between work, energy, kinetic energy, potential energy and power.
10. Differentiate between force and torque and apply the laws of equilibrium to practical situations.
11. Distinguish between displacement, amplitude, period, frequency and wavelength of a wave.
12. Describe behavior of waves in terms of reflection, refraction, diffraction and interference.
13. Distinguish between energy, intensity and intensity level in a wave.
14. Discuss Young's double slit experiment in terms of light being a wave.
15. Apply ray model of light to plane mirrors, refraction at boundary and to thin lenses.

## Assessments

- Test 1 - 4%
- Quizzes - 6%
- Test 2 - 8%
- Laboratory - 22%
- Final Exam - 60%

# MCD1190 – Chemistry A

## Description

Chemistry is the study of matter, its transformations, and the energy changes that accompany those transformations.

Chemistry is an important branch of science with applications in a number of areas (Applied sciences, Biochemistry, Engineering, Environmental chemistry, Material chemistry, Earth and space sciences). For example, knowledge of chemical concepts will assist us to explore new and cheaper energy sources, improve health and safety standards, and develop 'greener' and environmentally friendly processes, which reduce pollution and wastage in the environment.

This unit is designed to build on the students' base knowledge of chemistry by further exploration of:

1. Energy
2. Chemical Kinetics
3. Food Chemistry
4. Atomic Theory and the Periodic Table
5. Instrumental Analysis.

It is expected that students will investigate, explore and discuss chemical concepts and issues, and solve quantitative and qualitative problems in class.

## Prerequisites

MCD1170 Introductory Chemistry or VCE Year 11 Chemistry, Unit 3.

## Learning Outcomes

On completion of this unit, students should be able to:

1. Demonstrate the importance of energy transformations in thermochemical and electrochemical reactions.
2. Define reaction rate and find rate laws from initial rates and integrated rate laws.
3. Relate organic chemical structures to observed chemical reactions, using examples from those involved in human nutrition and global cycling of nutrients.
4. Analyse the arrangement of elements in the periodic table (including its historical development) and relate trends in properties of elements to their atomic structure.
5. Explore the different types of instrumental analysis techniques: IR, NMR, AES, AAS and Mass Spectroscopy

## Assessments

- Test 1 - 8%
- Test 2 - 10%
- Quizzes (1-10) - 12%
- Poster - 10%
- Final Examination - 60%

# MCD1200 – Physics A

## Description

Physics seeks to describe the fundamental nature of the universe and strives to reveal nature's underlying simplicity. This module continues on from Introductory Physics, and considers the basic concepts of practical investigation, rotational motion, electricity and magnetism, and atomic theories.

It must be remembered that physics is not just theories. It relies heavily on mathematics and numerical measurements to test certain theories – an aspect students will meet through the practical work.

## Prerequisites

MCD1180 Introductory Physics.

## Learning Outcomes

On completion of this unit, students should be able to:

1. Demonstrate knowledge of the value of practical work.
2. Apply the theory of rotational motion.
3. Solve problems involving electricity and magnetism.
4. Explain a range of atomic theories.

## Assessments

- Test 1 - 4%
- Quizzes (1-6) - 6%
- Test 2 - 8%
- Laboratory - 22%
- Final Exam - 60%

# MCD1470 – Engineering Practice

## Description

This unit is designed to extend the students' base knowledge into the following areas:

- Professions
- Design and Analysis
- Communication
- Ethics
- Economics.

It is expected students will investigate, explore and discuss engineering concepts and issues, and solve quantitative and qualitative problems in class.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Gain a foundation of engineering principles and integrate these principles with chemistry, physics, mathematics, economics and design principles.
2. Develop conceptual understanding and problem-solving abilities by applying engineering principles.
3. Develop proficiency with technologies for analysis, simulation, theoretical prediction, access to information, and report preparation.
4. Describe the importance and relevance of engineering and its interdisciplinary ties to other fields and society, in order to become a scientifically literate and ethical citizen.
5. Demonstrate proper and ethical scientific and engineering practices, including safety, environment, and record keeping.
6. Interpret scientific and engineering results and draw reasonable conclusions.
7. Communicate effectively through written and oral reports.

## Assessments

- Assignment 1 - 15%
- Assignment 2 (Test 1) - 10%
- Assignment 3 - 10%
- Assignment 4 (Test 2) - 10%
- Assignment 5 (Test 3) - 10%
- Final Design Project - 45%

# MCD1700 – Introductory Mathematics

## Description

This is a core unit in the Monash College Diploma Part 1 of Engineering, Information Technology and Science. The unit will provide students with the pre-requisite knowledge and skills to progress to the higher levels of mathematics in the Engineering IT and Science diploma; subsequently in the relevant degree programs.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Identify number sets in complex domain.
2. Use set notations to describe numbers.
3. Use interval notations to represent number sets.
4. Use real number line to express the number sets.
5. Use Venn diagram to represent number sets.
6. Solve linear and simultaneous linear equations using graphical and algebraic methods.
7. Use simultaneous linear equations to model and solve real world problems.
8. Recognise prime, rational, irrational and complex numbers.
9. Apply factor theorem to factorise polynomial functions.
10. Solve polynomial equations.
11. Solve quadratic equations using factorizing, quadratic formula or completing the square method.
12. Sketch graphs of quadratic functions.
13. Apply binomial expansion to solve problem in various algebraic contexts.
14. Simplify rational functions inequalities.
15. Plot complex numbers in the Argand diagram.
16. Find the rule for inverse function for given functions and sketch the graph of inverse functions.
17. Solve system of equations and literal equations.
18. Use exponential and logarithmic functions to model application problems.
19. Sketch graphs of exponential and logarithmic functions.
20. Solve exponential and logarithmic equations.
21. Convert radians in to degrees and vice versa.
22. Apply trigonometric ratios of $0^0, 30^0, 45^0, 60^0, 90^0$ to solve problem in various geometric and analytical geometric contexts.
23. Apply sine and cosine rule solve to solve problem in various geometric and analytical geometric contexts.

24. Sketch the graphs of trigonometric functions of sin, cos, tan, sec, cosec and cot.
25. Identify amplitude, period and mid line of $a\sin(bx+c)+d$ and $a\cos(bx+c)+d$.
26. Classify vectors and scalars.
27. Apply vector algebra to solve problems in geometry.
28. Express vectors using $\underset{\sim}{i}$ and $\underset{\sim}{j}$ components. In $\mathbb{R}^2$.
29. Express Cartesian coordinates in $\mathbb{R}^2$.
30. Calculated distance between two points in $\mathbb{R}^2$.
31. Use the formula $\left(\frac{nx_1+mx_2}{n+m},\frac{ny_1+my_2}{n+m}\right)$ to divide a line segment by given ratio.
32. solve problems related in Parallel and perpendicular lines in $\mathbb{R}^2$.
33. Recognise angles relating in parallel lines triangles and polygons.
34. Identify congruent and similar triangles.
35. Apply properties of congruent and similar triangles to solve problems in plane geometry and analytical geometry.
36. Recognise rectangle, rhombus, parallelogram and square from complex geometrical diagrams. Apply properties of rectangle, rhombus, parallelogram and square to solve problems in plane geometry and analytical geometry.

## Assessments

- Topic Quizzes - 10%
- Test - 20%
- Assignment - 5%
- Tutorial participation - 5%
- Final Examination - 60%

# MCD1750 – Intermediate Mathematics

## Description

This is a core unit in the Monash College Diploma Part 1 of Engineering, Information Technology and Science. The unit will provide students with the pre-requisite knowledge and skills to progress to the higher levels of mathematics in the Engineering IT and Science diploma; subsequently in the relevant degree programs.

## Prerequisites

MCD1700

## Learning Outcomes

On completion of this unit, students should be able to:

1. Apply the concept of vectors in Cartesian form in analytical geometry.
2. Find and apply position vector, magnitude of vector, unit vector, angles between vectors and direction cosines in two and three-dimensional problems.
3. Describe linear dependency and independency in vectors.
4. Find scalar and vector resolute, scalar product of vectors, application of scalar product.
5. Use Pythagorean identities $\sin^2\theta+\cos^2\theta=1;\ \tan^2\theta+1=\sec^2\theta;\ 1+\cot^2\theta=\mathrm{c}sc^2\theta$ in problem solving.
6. Apply compound-angle identities in various geometric and analytical geometric applications.
7. Find general solutions of simple and complicated trigonometric equations.
8. Apply limits, continuity and differentiation to solve mathematical problems.
9. Identify and analyse the nature of critical point using derivative tests.
10. Apply the differentiation to solve the problems in various context of engineering and other disciplines.
11. Extend the concept of derivatives by inverse circular functions.
12. Perform anti-differentiation calculations using integration by substitution, integration by partial fractions.

## Assessments

- Topic Quiz - 10%
- Test - 20%
- Assignment - 5%
- Tutorial participation - 5%
- Final examination - 60%

# MCD4140 – Computing for Engineers

## Description

This unit introduces software development and design using MATLAB, including data types and variables, structured programming, M-files and functions, numerical errors and uncertainty and the programming of numerical techniques. Numerical techniques covered include root finding, interpolation, linear and non-linear regression, numerical integration and ordinary differential equations.

## Prerequisites

Nil

## Co-requisites

MCD4500 Engineering Mathematics

## Learning Outcomes

On completion of this unit, students should be able to:

1. Develop an understanding of commonly used numerical methods for solving engineering problems; the ability to appropriately apply numerical methods to engineering problems and to know some of the limitations of such methods.
2. Develop structured problem solving techniques and to develop a knowledge of programming concepts and the ability to write simple programs.

## Assessments

- Lecture Quizzes and Computer Labs - 30%
- Assignment - 10%
- Final Examination - 60%

# MCD4160 – Physics for Engineering

## Description

This unit relates key principles of physics to engineering and technology, and shows how physics, including quantum and nano-science, creates useful new technologies. Energy, momentum and angular momentum: planetary orbits, rocket propulsion, precession, fly wheels. Oscillations and waves: resonance, transmission of energy; Doppler effect and speed measurement, polarization and stress models, diffraction and nano-structures, thin film interference and antireflecting film. Quantum Physics: Uncertainty Principle, wave functions, lasers, stimulated emission; synchrotron radiation, atomic force microscope. The practical component develops measurement, analysis, and communication skills.

## Prerequisites

MCD1200 Physics A (For Part 2 entry students, Part 1 pre-requisites are not applicable).

## Learning Outcomes

On completion of this unit, students should be able to:

1. Apply energy and momentum methods to analyse motion of systems.
2. Explain behaviours involving oscillations and waves and do appropriate analysis and calculations.
3. Explain, and apply basic quantum principles to, situations which are relevant in engineering and technology contexts; do appropriate analysis and calculations.
4. Demonstrate an ability to describe and explain advanced techniques used in relevant engineering or physics contexts.
5. Make reliable measurements, estimate uncertainties, analyse, evaluate and interpret data in cases appropriate to engineering and related to the theory studied.
6. Show an improved ability to work in teams and to communicate and discuss physics concepts, measurements and applications related to engineering and developments in technologies.
7. Approach new problems and find solutions on the basis of general principles, and evaluate the appropriateness of their proposed models or solutions.

## Assessments

- Quizzes / Assignment - 10%
- Test 1 (Mechanics) - 14%
- Test 2 (Oscillation and Waves) - 14%
- Laboratory Work - 22%
- Final Examination - 40%

# MCD4270 – Engineering Design: Lighter, Faster, Stronger

## Description

This unit develops a process for the analysis and design of static and dynamic structures and mechanisms using engineered materials. Through a multidisciplinary approach, the fundamentals of mechanical, civil and material engineering will be explained and the basic concepts of loads and motions are introduced.

Team based projects will highlight the multidisciplinary nature of modern engineering. These concepts will be practised through hands-on projects carried out by teams. Communication and teamwork skills will be developed through teamwork tasks.

This is core unit in the Monash College Diploma of Engineering, Part 2.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Describe, with examples, the multi-disciplinary nature of modern engineering problems.
2. Describe, with examples, the role of engineers in the design of structures and mechanisms in modern society.
3. Identify different structural forms (including beams and trusses) and translate physical structures into appropriate models for analysis and design.
4. Apply fundamental concepts of kinematics and kinetics to analyse motion of particles and rigid bodies.
5. Apply energy methods to analyse the motion of particles and rigid bodies.
6. Describe the key properties of structural materials for specific applications.
7. Define, measure and summarize the importance of the microstructure of materials and analyse the microstructure-property relationship.
8. Explain how different material processing routes directly influence material structural properties.
9. Develop and apply problem-solving techniques that demonstrate .knowledge and application of the technical content considered in the unit.
10. Recognize and apply systematic principles of engineering design.
11. Complete tasks as part of a team and communicate effectively with team members prepare and present oral and written reports in a professional engineering format.

## Assessments

- Lecture Quizzes / Work Sheets - 5%
- Test 1 - 15%
- Project 1: Spaghetti Bridge - 12%
- Materials Assignment – 6%
- Project 2: Trebuchet – 12%
- Test 2 – 10%
- Examination - 40%

# MCD4280 – Engineering Design: Cleaner, Safer, Smarter

## Description

Fundamentals of electrical, chemical and materials engineering will be introduced and applied to provide technological solutions for real-world problems. Theory underpinning analogue and digital circuit design; energy and mass balance; materials processing and the role of functional materials will be presented. The contribution of each topic to a contemporary engineering application will be demonstrated.

Team based projects will highlight the multidisciplinary nature of modern engineering. These concepts will be practiced through hands-on projects carried out by teams. Communication and teamwork skills will be developed through teamwork tasks.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Describe, with examples, the multi-disciplinary nature of modern engineering problems.
2. Employ standard electrical laboratory equipment to measure electrical quantities used to debug circuits.
3. Apply fundamental concepts of resistance, current, voltage and Kirchhoff's Laws to analyze simple circuits.
4. Employ fundamental theories of electrical engineering to build analogue and digital circuits.
5. Analyse steady state systems with and without chemical reaction through the application of mass balance concepts.
6. Analyse thermodynamic processes through the application of energy balance concepts.
7. Describe the key properties of functional materials for specified applications.
8. Define, measure and summarize the importance of key properties of functional materials on their intended application and explain the structure-property relationship.
9. Explain how different material processing routes directly influence material structural properties.
10. Develop and apply problem-solving techniques that demonstrate knowledge and application of the technical content considered in the unit.
11. Recognize and apply systematic principles of engineering design.
12. Complete tasks as part of a team and communicate effectively with team members.
13. Prepare and present oral and written reports in a professional engineering format.

## Assessments

- Pre-Lecture Online Quizzes – 9%
- Practice Class Participation – 13%
- Project 1 Written Report – 15%%
- Project 2 Written Report – 5%
- Project 2 Demonstration – 10%
- Worksheet Booklets – 3%
- Lecture Participation – 5%
- Examination – 40%

# MCD4290 – Engineering Mobile Apps

## Description

This unit introduces students to the use of Information Technology (IT) in modern engineering practice. Students will learn an object-oriented approach to both computer systems and software engineering for solving engineering problems. Students will work in small teams to develop a mobile application that meets a contemporary need in engineering. The fundamental stages in the software development lifecycle will be introduced, including requirements analysis, design, implementing and verification. Students will use IT tools to support the engineering process.

This is a core unit in the Monash College Diploma of Engineering, Part 2.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Describe the capabilities and limitations of mobile computing devices, as well as the interaction between developments in IT and their use in modern Engineering practice.
2. Construct mobile applications that utilise device capabilities to solve engineering problems using a simple object-oriented software approach.
3. Employ IT tools for aspects of the software engineering process, including a code editor, debugger, shared code repository and version control system, task-tracking and team communication tools.
4. Prepare written technical documentation in a standard design formalism from a template.
5. Complete tasks as part of a team, and communicate effectively with team members.
6. Prepare and deliver oral presentations in a professional engineering format.

## Assessments

- Pre-workshop Quizzes - 12%
- Tutorial Class Work - 6%
- Practical Class Work - 6%
- Assignment 1 - 12%
- Assignment 2 - 24%
- Examination - 40%

# MCD4390 – Chemistry I

## Description

The purpose of this unit is to provide students with knowledge and skills in the following areas:

Atoms and Atomic Structure & Periodicity; Polyatomic Molecules: Shapes; Molecular Orbital Theory; the ideal & real gas equations, and intermolecular bonding; Thermodynamics; Equilibria and Reaction Kinetics.

Practical exercise are illustrative of the theory component and provide experience in laboratory techniques and laboratory OHSE practices. Student needs to have a basic knowledge of chemistry (VCE level) or required knowledge equivalent to Monash College unit MCD1170: Introductory Chemistry.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Discuss the features of atomic structure and the construction of the periodic table of elements.
2. Interpret relationships between electronic structure and bonding.
3. Explore a wide range of molecular structures and investigate aspects of stereochemistry such as isomerism and chirality.
4. Distinguish between ideal gases and real gases.
5. Recognise factors which give rise to polarity and its relationship to intermolecular bonding.
6. Define the first and second laws of thermodynamics and apply enthalpy and entropy.
7. Discuss factors which give rise to chemical kinetics.
8. Apply acid-base chemistry in the understanding of dynamic equilibria.
9. Foster the acquisition of practical skills by exploiting an inquiry-based approach to the chemistry laboratory experience.
10. Communicate chemistry, discuss the social and environmental responsibility of chemists in the global community.

## Assessments

- Tutorial participation - 10%
- Laboratory component - 30%
- Online assessment - 10%
- Final examination - 50%

# MCD4490 – Advanced Mathematics

## Description

This unit develops knowledge and skills in Mathematical logic, complex numbers and vectors. It provides an extension into circular functions and differential calculus including anti-derivatives and differential equations, investigates applications particularly for use in other engineering subjects, such as kinematics.

This unit aims to cover the core of the Mathematical knowledge and essential skills that form the foundation of engineering studies.

## Prerequisites

MCD1750 (Intermediate Mathematics) or Mathematical Methods units 3 & 4 equivalent.

## Learning Outcomes

On completion of this unit, students should be able to:

1. Sketch and transform circular functions and their inverse functions.
2. Simplify circular function expressions and solve trigonometric equations.
3. Use techniques of mathematical proof in algebra geometry and calculus.
4. Apply the combinations of sine and cosine functions, converting $a \cos x + b \sin x$ to a single sine $A \sin(x+\alpha)$.
5. Understand the concept of complex numbers and construct the Argand Diagram.
6. Perform operations with complex numbers in Cartesian, polar and exponential form. Understand the Euler's formula.
7. Apply De Movre's theorem for computation powers and roots of complex numbers.
8. Find loci and subsets of the complex plane.
9. Apply implicit and logarithmic differentiation in various contexts.
10. Perform anti differentiation calculations using inverse trigonometric functions, integration by substitution, integration by parts, and integration by partial fractions.
11. Use definite integration to find volumes of revolution, center of mass, mean value and root mean square.
12. Perform computation with vector calculus, such as displacement, velocity and acceleration.
13. Understand the concept of exponential growth, differential equation and initial value problem.
14. Solve differential equations with separable variable and explore various differential equations in engineering applications.
15. Use vector calculus in dynamics.

## Assessments

- Assignment - 5%
- Test - 10%
- Project - 5%
- Lecture quiz and attendance - 5%
- Tutorial participation - 5%
- Examination - 70%

# MCD4500 – Engineering Mathematics

## Description

This unit allows students to explore fundamental concepts and techniques required for first year Engineering.

## Prerequisites

MCD4490 (Advanced Mathematics)

## Learning Outcomes

On completion of this unit, students should be able to:

1. Evaluate cross products of vectors and use vectors to represent lines and planes.
2. Perform matrix algebra.
3. Solve up to 3x3 systems of linear equations and find eigenvalues and eigenvectors.
4. Use hyperbolic functions.
5. Evaluate improper integrals of elementary functions and use integration byparts.
6. Appreciate convergence of numeric and power series, construct Taylor series and estimate errors in numerical approximations.
7. Solve first order ordinary differential equations, including by separable variables and integrating factors.
8. Solve second order linear differential equations with constant coefficients.
9. Use differential equations to model simple engineering problems.
10. Evaluate and invert Laplace transforms and use them to solve ordinary differential equations.
11. Calculate partial derivatives, use the gradient vector to find directional derivatives and find extreme values of two-variables functions.
12. Express and explain mathematical techniques and arguments clearly in words.

## Assessments

- Assignment 1 - 5%
- Test - 10%
- Assignment 2 - 5%
- Lecture quiz and attendance - 5%
- Tutorial participation - 5%
- Examination - 70%

# MCD4700 – Introduction to Computer Systems, Network and Security

## Description

The unit introduces students to fundamentals of computer systems, networks and security. It provides basic knowledge of computer organisation and architecture, operating systems, networking architecture, technology and operation. It introduces the concepts of security goals for protecting common modern computer systems and communication networks from adversaries and the deployment of suitable countermeasures to achieve these goals.

## Prerequisites

Nil

## Learning Outcomes

On completion of this unit, students should be able to:

1. Analyse simple logic circuits.
2. Explain and analyse key computer structure and its operations.
3. Analyse and evaluate various strategies used by an operating system in managing the system resources and running applications efficiently.
4. Describe the operation of communication and networking models and develop simple solutions to network problems.
5. Critically assess the security threats and risks to an organisation's information assets and propose suitable security control technologies that can be applied to reduce the security risks or in making procurement decisions.

## Assessments

- Practical Class Work - 10%
- Assignment 1 - 20%
- Assignment 2 - 20%
- Final Exam - 50%