

Unit Title:	Mechanical Science – Movement and Flow
Unit Level:	Three
Unit Credit Value:	9
Unit Code:	WNI580
Unit Type:	Academic Subject Content
Unit Review Date:	31/12/2028
Graded / Ungraded:	Graded

This unit has 5 learning outcomes:

Learning outcomes	Assessment criteria
The learner will:	The learner can:
1. Be able to demonstrate the principle of moments and system equilibrium constructing shear force and bending moment diagrams with reference to working situations.	1.1 Use vector diagrams to solve practical problems in statics. 1.2 Demonstrate, by calculation, the equilibrium of uniform, simply supported beams and other simple force systems (i.e. cantilever) with concentrated and uniformly distributed loads. 1.3 Determine the magnitude and position of the maximum bending moment for different load configurations and any points of contraflexure.
2. Understand the relationship between mass, velocity and momentum for linear motion.	2.1 Describe the concepts of: (a) Mass (b) Momentum (c) Impulse (d) Impact 2.2 Use vector diagrams to solve practical problems.
3. Be able to solve problems involving potential and kinetic energy and energy transfer through mechanical power plant, braking systems and rotating shafts.	3.1 Demonstrate, by calculation the concepts of potential energy as energy due to position and kinetic energy as energy due to motion. 3.2 Apply the principle of conservation of energy to systems in motion. 3.3 Define the relationship between heat, work and power. 3.4 Apply the concepts in 3.1, 3.2 and 3.3 in determining the power transmitted by rotating

	shafts, mechanical power plant and braking systems: (a) the Shear Modulus and Young's Modulus (b) the effect of torsion and double shear
4. Be able to adapt the energy balance to produce Bernoulli's equation applying it to the solution of practical problems involving fluids in motion.	4.1 Apply Bernoulli's equation to practical flow systems.
5. Understand the concepts involved in Thermodynamic system and apply theories to given situations.	<p>5.1 Solve simple problems identifying the energy forms in the steady flow energy equation and their algebraic signs.</p> <p>5.2 Use a systems approach to identify inputs and outputs to the system.</p> <p>5.3 Demonstrate by calculation the concepts of: (a) Sensible and latent heat (b) Single and two-phase systems</p> <p>5.4 Examine the differences between gases and liquids.</p> <p>5.5 Solve problems involving the combined gas equation $PV/T = K$ and the characteristic gas equation $PV = mRT$</p>

Assessment (Graded)

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| 1. Meets assessment criteria | At least a Pass |
| 2. Further grading | |
| <ul style="list-style-type: none"> ▪ Meets assessment criteria but not merit grading standards ▪ Meets assessment criteria and merit but not distinction grading standards ▪ Meets assessment criteria and distinction grading standards | <p>Pass</p> <p>Merit</p> <p>Distinction</p> |