

Unit Title:	Engineering Materials
Unit Level:	Three
Unit Credit Value:	3
Unit Code:	WNI573
Unit Type:	Academic Subject Content
Unit Review Date:	31/12/2028
Graded / Ungraded:	Graded

This unit has 4 learning outcomes:

Learning outcomes	Assessment criteria
The learner will:	The learner can:
1. Understand material properties.	1.1 Describe the physical and chemical properties of metals, alloys and composite materials. 1.2 Discuss metallurgy and the composition of metals, alloys and composite materials. 1.3 Identify motorsport component requirements and their physical and operation constraints.
2. Know about appropriate material selection.	2.1 Describe the difference between ferrous and non-ferrous metals. 2.2 Describe the layup of a range of composite materials and their restrictions to strength. 2.3 Select appropriate material choices for a range of components.
3. Know about appropriate solutions to motorsport materials engineering.	3.1 Explain casting, forming and shaping techniques. 3.2 Identify various solutions to rapid prototyping and rapid manufacturing techniques for motorsport component development. 3.3 Describe appropriate joining techniques for various motorsport material selection including bonding, welding and brazing.
4. Understand material limits and failure analysis.	4.1 Explain stress, strain and fatigue for a selection of motorsport metals, alloys and composite materials.

	<p>4.2 Calculate material failure limits for a range of motorsport materials.</p> <p>4.3 Identify solutions to minimising failure of components.</p> <p>4.4 Simulate Finite Element Analysis (FEA) on a range of motorsport components.</p> <p>4.5 Identify appropriate solutions to improve strength and reduce failure of motorsport components through analysis of FEA simulations.</p>
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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> |