DCSSTA634: Use Statics in Engineering

UNIT CODE		**DCSSTA634**	
UNIT TITLE		**Use statics in engineering**	
APPLICATION		This unit describes the performance outcomes, skills and knowledge required to solve problems involving forces on statically determinate structures. The unit of competency is applied by drafting personnel or technicians in a civil and structural engineering environment to perform calculations using statics and create explanatory drawings. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.	
ELEMENTS		**PERFORMANCE CRITERIA**	
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Determine reactions to structures and / or parts of a structure.	1.1	Draw a free body diagram of components using standard industry symbols.
		1.2	Apply the equations of equilibrium to determine reactions.
2	Use scalar and vector analysis in engineering problems.	2.1	Identify scalar and vector quantities.
		2.2	Evaluate resultants of vectors using graphical and numerical procedures.
		2.3	Resolve vector quantities into orthogonal components.
		2.4	Solve problems involving the equilibrium of concurrent forces.
3	Determine forces in members of a truss.	3.1	Apply the method of joints to determine the sense and magnitude of the forces in members of a truss.
		3.2	Apply the method of sections to determine the sense and magnitude of the forces in members of a truss.
4	Construct shear force diagrams for loaded beams.	4.1	Create a drawing to model loaded beams using standard industry symbols.
		4.2	Calculate the shear force at critical sections along the beam.
		4.3	Graphically represent the shear force at various positions along the beam using industry standards.
5	Construct bending moment diagrams for loaded beams.	5.1	Calculate the bending moment at critical sections along the beam.
		5.2	Graphically represent the bending moment at various positions along the beam using industry standards.
FOUNDATION SKILLS Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.			

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UNIT MAPPING INFORMATION No equivalent units.	
TITLE	**Assessment requirements for DCSSTA634 Use statics in engineering**
PERFORMANCE EVIDENCE	To achieve competency in this unit, a person must satisfy the requirements of the elements and performance criteria, foundation skills and range of conditions included in the unit. The person must also: • solve written problems in statics using the most appropriate computational method • present information in a relevant format Note: If a specific volume or frequency is not stated, then evidence must be provided at least once for each criterion.
KNOWLEDGE EVIDENCE	To achieve competency in this unit, a person must demonstrate knowledge of: • Key concepts and principles in statics, including: – properties of scalar quantities – properties of vector quantities – resolution of vectors into component parts – resolving two or more vectors – definition of a force – properties of a force including magnitude, direction, line of action, point of application, sense (Tensile/Compression, push pull) – Newton's laws of motion – moment of a force – representation of common supports including fixed, pinned, roller and cable – conditions required for static equilibrium – equations of equilibrium

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ASSESSMENT CONDITIONS	**Assessment Conditions:** All assessment must be completed in accordance with work health and safety standards. When assessments are conducted remotely, invigilation software must be used to ensure authenticity of work completed. Model answers or marking guides must be provided for all assessments to ensure reliability of assessment judgements when marking is undertaken by different assessors. Assessors must gather a range of evidence that is valid, sufficient, authentic, and current. Questioning techniques must not require language, literacy and numeracy skills beyond those required in this module. The candidate must have access to all tools, equipment, materials and documentation required. **Assessor Requirements:** Assessment must be conducted only by persons who: • hold vocational competencies at least to the level being delivered and assessed • maintain current industry skills directly relevant to the training and assessment being provided • hold a tertiary qualification in engineering or a related field • meet the assessor requirements specified in the current Standards for Registered Training Organisations (RTOs) • undertake ongoing professional development in vocational training, learning, and assessment, including competency-based training and assessment, as required by their RTO. The RTO must also ensure that trainers and assessors keep their industry knowledge up to date through ongoing professional development. The RTO must take appropriate steps, as an ongoing procedure, to verify information about trainer and assessor's qualifications.