

Year 11 Engineering—Key Components Autumn 1 – Trial Synoptic Project

Key Vocabulary – Produce hand drawn engineering drawings (LO1)	
Vocab	Definition
Freehand sketching Rendering	Colour, direction of light, surface finish, texture.
Freehand sketching Annotation	Materials, manufacturing details.
Freehand sketching Dimensions	Angles, lengths, diameters
Isometric drawing	3 dimensional drawing with angles at 30 degrees
Isometric drawing	Scale, Tolerance, Title Block
Isometric drawing dimensions	Angles, lengths, diameters
Isometric drawing units	Imperial, metric.
Isometric drawing lines	Visible, hidden, centre, construction
Orthographic drawing	First and third angle
Orthographic drawing	Scale, Tolerance, Title Block
Orthographic drawing dimensions	Angles, lengths, diameters
Orthographic drawing units	Imperial, metric.
Orthographic drawing lines	Visible, hidden, centre, construction

Learning outcome 1: Produce hand drawn engineering drawings

In this learning outcome, the learner will be able to produce hand drawn engineering drawings. The learner will be able to apply specific drawing conventions and use layouts recognised within the engineering industry following British Standard.

1.1.1 A freehand sketch

1.1.2 An A3 hand drafted isometric drawing sheet

1.1.3 An A3 hand drafted orthographic drawing sheet

Students will apply all of their knowledge and skills from unit one taught during year 10 and unit 2 taught in year 11 to produce a trial synoptic project. This is a piece of coursework that will showcase the best planning and practical work that students can produce. The actual synoptic project, started after Christmas, will form 60% of your final mark in this subject.

Key Vocabulary – Produce Computer-Aided Design engineering drawings (LO2)	
Vocab	Definition
Isometric drawing	3 dimensional drawing with angles at 30 degrees
Isometric drawing	Scale, Tolerance, Title Block
Isometric drawing dimensions	Angles, lengths, diameters
Isometric drawing units	Imperial, metric.
Isometric drawing lines	Visible, hidden, centre, construction
Orthographic drawing	First and third angle
Orthographic drawing	Scale, Tolerance, Title Block
Orthographic drawing dimensions	Angles, lengths, diameters
Orthographic drawing units	Imperial, metric.
Orthographic drawing lines	Visible, hidden, centre, construction

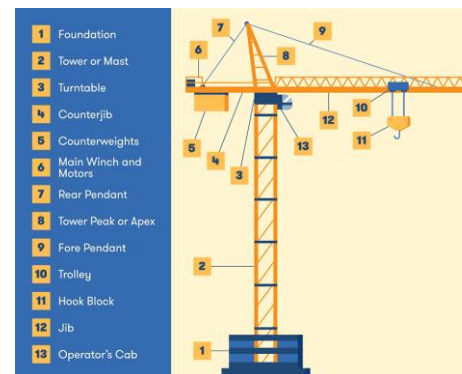
Learning outcome 2: Produce Computer-Aided Design (CAD) engineering drawings

In this learning outcome, the learner will be able to use CAD software to produce engineering drawings. The learner will be able to apply specific drawing conventions and use layouts recognised within the engineering industry following British Standard BS 8888.

1.1.1 A freehand sketch

1.1.2 An A3 hand drafted isometric drawing sheet

1.1.3 An A3 hand drafted orthographic drawing sheet



For your trial synoptic project you will draw, plan, and manufacture a working scale model of a tower crane. You must show your skills using hand drawn and CAD drawings and your manufacturing skills with a variety of different materials. You will also be assessed on your planning skills including health and safety.

Year 11 Engineering—Key Components Autumn 2 – Trial Synoptic Project

Key Vocabulary – Demonstrate production planning techniques (LO3)	
Vocab	Definition
Risk assessment - Hazzard	Something with the potential to cause harm
Risk assessment - Risk	The likelihood the hazard will cause harm
Risk assessment – Control measures	Actions, activities, equipment that is used to prevent eliminate or reduce the risk of a hazard occurring.
Production plan	Tools and equipment, Health and safety, Quality control, Flow chart symbols, Time plan.

Learning outcome 3: Demonstrate production planning techniques

In this learning outcome the learner will be able to plan the manufacturing process of an engineered product, for a manufacturing task. The learner will be able to plan the process, giving consideration to the individual stages of manufacture, to include health and safety factors.

3.1.1 Risk assessment

3.1.2 Production planning

Key Vocabulary – Demonstrate processing skills and techniques applied to materials for a manufacturing task (LO4)	
Vocab	Definition
Preparing materials	Cleaning, Marking out.
Modify shape and size of material	Cutting, Drilling, Bending, Casting, Computer-Aided Manufacture.
Join materials	Riveting, Gluing, Bolting, Soldering.
Finish materials	Filing, Sanding, Polishing, Applying a surface finish.
Preparation and use	Handheld tools, Power tools, Fixed machines, Computer Numerical Control/Computer-Aided Manufacture machines
Control measures	Guards and safety zones Isolation and emergency power cut-off, Personal protective equipment (PPE), Extraction and ventilation

Learning outcome 4: Demonstrate processing skills and techniques applied to materials for a manufacturing task

In this learning outcome the learner will demonstrate a variety of processing skills and manufacturing techniques: preparing, modifying, joining and finishing techniques applied to materials for a manufacturing task, whilst maintaining safe and correct use of tools, equipment and machines

4.1.1 Preparing materials

4.1.2 Modify shape and size of material

4.1.3 Join material

4.1.4 Finish materials

4.2.1 Safe preparation and use

4.2.2 Control Measures



For your trial synoptic project you will draw, plan, and manufacture a working scale model of a tower crane. You must show your skills using hand drawn and CAD drawings and your manufacturing skills with a variety of different materials. You will also be assessed on your planning skills including health and safety.

AO1 Recall knowledge and show understanding	
Band	Descriptors
3	Learners recall and communicate a wide range of comprehensive engineering knowledge and understanding. Subject-specific terminology is used accurately and consistently throughout the project.
2	Learners recall and communicate a range of engineering knowledge and understanding. Subject-specific terminology is used appropriately on occasion .
1	Learners recall and communicate basic engineering knowledge and understanding. Subject-specific terminology is basic and inconsistent .
NYA	No rewardable material.

AO2 Apply knowledge and understanding	
Band	Descriptors
3	Learners accurately apply knowledge and understanding of maths, science and engineering theory, which is relevant to the context and situation .
2	Learners' application of knowledge and understanding of maths, science and engineering theory is mostly accurate and has some relevance to the context and situation.
1	Learners' application of knowledge and understanding of maths, science and engineering theory is of limited accuracy and relevance to the context and situation.
NYA	No rewardable material.

AO3 Analyse and evaluate knowledge and understanding	
Band	Descriptors
3	Learners critically analyse and evaluate engineering information, systematically judging and reaching reasoned and valid conclusions.
2	Learners appropriately analyse and evaluate engineering information, judging and reaching usable conclusions.
1	Learners respond simply to engineering information and provide comments .
NYA	No rewardable material.

AO4 Demonstrate and apply technical skills and processes	
Band	Descriptors
3	Learners demonstrate and apply relevant engineering technical skills effectively , by applying and using appropriate engineering processes, tools and techniques. Learners demonstrate and apply engineering technical skills to develop a complete and effective solution/outcome.
2	Learners demonstrate and apply mostly relevant engineering technical skills by applying and using mostly appropriate engineering processes, tools and techniques. Learners demonstrate and apply engineering technical skills to develop a mostly complete and working solution/outcome.
1	Learners demonstrate and apply basic engineering technical skills by applying and using, in a limited way , engineering processes, tools and techniques. Learners demonstrate and apply engineering technical skills to develop a partially complete solution/outcome.
NYA	No rewardable material.

AO5 Manage and evaluate the project	
Band	Descriptors
3	Learners manage the project, including preparation and planning of a wide range of project stages, time frames and resources. Learners evaluate a range of their approaches, skills and accomplishments.
2	Learners manage the project, including preparation and planning of a range of project stages, time frames and resources. Learners evaluate some of their approaches, skills and accomplishments.
1	Learners manage the project, including preparation and planning of a limited range of project stages, time frames and resources. Learners provide comments on some of their approaches, skills and accomplishments.
NYA	No rewardable material.

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