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Delivery Guide

NCFE Level 2 Certificate in Engineering Studies (601/4532/8)

Delivery and Assessment Plan

1. Based on 2 year delivery and an average timetable of 2 hours per week, 38 weeks per year. This may change with school timetable, festivals and holidays, training days, school events, study leave arrangements, which day lessons occur on etc.
2. This is only an example – centres may choose to deliver and assess units in a different order, taking into account the timings of the external assessment (Unit 02).
3. Guided learning hours (GLH) for each unit is 30 GLH.
4. External assessment unit 02 dates vary –please check here for details www.ncfe.org.uk/schools/key-stage-4-v-certs.
5. It's advised that the grading of each unit takes place as soon as possible after the learner has completed their internal assessment tasks and that this is closely followed by internal moderation and submission of grades. The first external moderation visit should then take place as soon as possible after the first round of internal moderation in order to allow your Moderator to offer support and guidance on your delivery and assessment (please note this will need to be scheduled in advance with the External Moderator to ensure availability).
6. Once the agreed grades have been 'banked' by the External Moderator (first attempt) the learners should be provided with an opportunity to add to their assessed evidence to improve their grade as soon as is practicable (second attempt). This will ensure the unit is still fresh in their minds and the additional evidence should then be assessed and internally moderated in preparation for external moderation.

Please refer to the scheme of work for this example for a week-by-week overview of teaching and learning and assessment.

	Year 1						Year 2					
	Autumn 1st half term	**Autumn 2nd half term**	**Spring 1st half term**	**Spring 2nd half term**	**Summer 1st half term**	**Summer 2nd half term**	**Autumn 1st half term**	**Autumn 2nd half term**	**Spring 1st half term**	**Spring 2nd half term**	**Summer 1st half term**	**Summer 2nd half term**
Unit 01												
Unit 02												
Unit 03												
Unit 04												

Weeks (approx.)	Unit 01	Unit 02	Unit 03	Unit 04	Teaching and Learning	Assessment	Moderation
Year 1 autumn term – 1st half term							
7					Unit 01 learning outcome 1	Internal assessment task 1	
Year 1 autumn term – 2nd half term							
7					Unit 01 learning outcome 2	Internal assessment tasks 2 and 3	
Year 1 spring term – 1st half term							
6					Unit 01 learning outcome 3 Unit 03 learning outcome 1 and 4	Internal assessment task 3 Internal assessment task 1	Internal moderation for unit 01
Year 1 spring term – 2nd half term							
7					Unit 03 learning outcomes 1 and 2	Internal assessment task 2	First external moderation visit
Year 1 summer term – 1st half term							
5					Unit 03 learning outcome 3 and 4	Internal assessment task 3	
Year 1 summer term – 2nd half term							
6					Unit 02 learning outcomes 1 and 2		Internal moderation for unit 03

Weeks (approx.)	Unit 01	Unit 02	Unit 03	Unit 04	Teaching and Learning	Assessment	Moderation
Year 2 autumn term – 1st half term							
7					Unit 02 learning outcome 2	External assessment – practice papers	
Year 2 autumn term – 2nd half term							
7					Unit 02 assessment Unit 04 learning outcomes 1 and 2	External assessment – first attempt	
Year 2 spring term – 1st half term							
6					Unit 04 Learning outcomes 1 and 2	Internal assessment – task 1	
Year 2 spring term – 2nd half term							
7					Unit 02 – assessment Unit 04 learning outcome 2	External assessment – second attempt Internal assessment – task 1	
Year 2 summer term – 1st half term							
5					Completion and revisions to internal assessments		Internal moderation of Unit 04. Second external moderation visit.

Scheme of work

Below is a scheme of work that you may choose to follow when delivering the NCFE Level 2 Certificate in Engineering Studies (601/4532/8)

1. Internal Sample Assessment tasks to support this Scheme of Work are available on the qualification page on our website.
2. This scheme of work is designed to offer centres some ideas for delivery of the qualification; it does not represent the detail of lesson planning necessary in many schools eg starter/plenary activities, homework tasks, literacy and numeracy.
3. All activities are examples only and can be substituted to suit the individual situation of the school, teacher and learners.
4. The assessment shown is only that required for the qualification and does not include formative assessment and marking as these will be according to the school policy.

This Scheme of Work is based on delivery over 2 years, allowing flexibility with 2 opportunities to sit the external assessment for Unit 02 on 3 possible occasions. The 120 GLH is split up over 67 weeks with 2 hours delivery each week with an additional 4 weeks timetabled in for the external assessments.

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
Year 1 autumn term – 1st half term					
1	Unit 01	1. 1 Explain the term 'engineering'	General introduction to the units within the course and what they contain. Research task and discussion: explanation of the term, including generic disciplines and examples of the disciplines. Use of visual examples of iconic engineering.	Learners shown what a typical assessment looks like and how this is graded Pass, Merit and Distinction.	• unit specification required • grading profiles • engaging engineering photographs and features
2	Unit 01	1.2 Describe different engineering **sectors**	Introduce the assessment task. Learners asked to research and establish "does engineering have sectors?". What are the different engineering sectors? What are the different sub-sectors that you might find? Sectors can include: mechanical, electrical, marine and civil engineering. Learners produce a short presentation for the group.	Portfolio of evidence unit 01. Internal assessment task – task 1.	You may wish to create your own internal assessments or a sample internal assessment task can be found on the qualification page. This task can be used directly or altered to suit your school.
3	Unit 01	1.3 Describe the skills and qualities needed to become an engineer.	What are the different physical, communication and academic skills that you need to be an engineer? Include soft and hard skills.	Learners gather research evidence on skills and qualifications for assessment task	

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
4	Unit 01	1.4 Assess the importance of health and safety in a chosen engineering environment	Teacher plays a video of an engineering task. Video is stopped and started with debate of the hazards associated with the tasks undertaken. Identify the risks and give explanations of consequences within different engineering environments. What repercussions can result from non-compliance?	Learners assess why health and safety aspects are important to the operations that they are watching in support of assessment criterion 1.4	Engineering related video required.
5	Unit 01	1.1 Explain the term 'engineering' 1.2 Describe different engineering **sectors** 1.3 Describe the skills and qualities needed to become an engineer 1.4 Assess the importance of health and safety in a chosen engineering environment	Site visit to an engineering company. Teacher should select a sector that covers a wide range of engineering work to engage learners and provide sufficient evidence in support of assessment criteria.	Opportunity to take photographs, notes and materials to support evidencing assessment criteria 1.1-1.4.	Engineering site visit: • documentation • Risk Assessment
6 7	Unit 01	1.1 Explain the term 'engineering' 1.2 Describe different engineering **sectors** 1.3 Describe the skills and qualities needed to become an engineer 1.4 Assess the importance of health and safety in a chosen engineering environment	Portfolio development	Learners work on the associated tasks for learning outcome 1.	Assignment tasks

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
Year 1 autumn term – 2nd half term					
8	Unit 01	2.1 Describe a range of engineering **organisations** and the product(s)/service(s) they provide 2.2 Compare manufacturing processes for the chosen engineering organisations	Teacher supplied case study, review an organisation: • What product(s) or service(s) does it provide? • How are they linked to other manufacturers? • What manufacturing processes does the organisation use? • What are the differences between the processes in its production? • Why would they use those processes? • What are the advantages/disadvantages of those processes?	Portfolio of evidence unit 01. Internal assessment task – task 2	Case studies
9			Guest speaker(s) from an engineering organisation(s). • illustrations from speaker on the different products that they provide • range of engineering organisations demonstrated by the speaker • opportunity for learners to discuss, debate and ask questions		Arrange guest speaker(s)
10			Learners research other engineering organisations, looking at the same information as the case study in week 8.		Case study

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
11	Unit 01	2.3 Describe the advantages and disadvantages that the product(s)/service(s) has on society	Learners extended research on the products to now include some evaluation. What are the advantages and disadvantages? Explain why, giving good reasons and justifications.		
12		2.1 Describe a range of engineering **organisations** and the product(s)/ service(s) they provide 2.2 Compare manufacturing processes for the chosen engineering organisations 2.3 Describe the advantages and disadvantages that the product(s)/service(s) has on society	Portfolio development – opportunity to assemble evidence and write up descriptions against each of the three assessment criteria.		
13					
14		3.1 Describe the use of science in engineering 3.2 Describe the use of technology in engineering 3.3 Describe the use of maths in engineering	What science is involved in engineering? Learners explore any aspect of science and its application to engineering. Examples to include expansion and contraction, heat, cold and strength to weight.	Portfolio of evidence unit 01. Internal assessment task – task 3. Continued after holidays.	Engaging case studies

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
Year 1 spring term – 1st half term					
15	Unit 01	3.1 Describe the use of science in engineering 3.2 Describe the use of technology in engineering 3.3 Describe the use of maths in engineering	Why do we use maths in engineering? Why do we need to add up in engineering? What would we calculate? Examples to include total weight, sizes, heights and lengths.	Portfolio of evidence unit 01. Internal assessment task – task 3 Continued from week 14	
16			How is technology applied in an engineering discipline/sub discipline? Learners to look at technological advances, for example carbon fibre.		You tube video for engineering technology
17			Portfolio development – learners produce the descriptions for the assessment criteria reinforced with diagrams and illustrations that are engineering related.		

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
18	Unit 03	1.1 Describe the purpose of common hand tools **found** in an engineering environment	Introduction to unit 03. A selection of hand tools are placed on a bench for discussion. Some of them need to be for alternative industries so selection can be made part of the activity • What tools can you identify? • How and why is that tool used? • What is its purpose? • What suppliers' instructions or basic rules should be followed with regards to operation and safety? Learners use three tools from the session to assist with evidencing for assessment criterion 1.1.	Portfolio of evidence unit 03. Internal assessment task – task 1 Witness and observation records can be used alongside reports, annotated photographs and manufacturing reports produced by the learner. Sample forms for recording these observations can be found on our website www.ncfe.org.uk/policies-documents/forms-and-documents. Continued in week 21	You may wish to create your own internal assessments or a sample internal assessment task can be found on the qualification page. This task can be used directly or altered to suit your school.
19		1.2 Select the most appropriate common hand tools for an identified purpose 1.3 Perform **operations** with common hand tools, for an identified purpose 1.4 Demonstrate sufficient **maintenance techniques** for the tools used. 4.1 Demonstrate a safe working environment throughout	A range of tasks are provided from which learners select one each. They have to identify the hand tools that would be required for their selected task. Learners need to provide evidence in the form of requisition slips, lists, audio-video or written reports and manufacturing plans. They must explain why they have selected the tools, show the tools being used and explain what maintenance procedures they would use for each tool.		A range of practical tasks to be developed that demonstrate manual skills. Requisition orders.

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
20	Unit 03	1.2 Select the most appropriate common hand tools for an identified purpose 1.3 Perform **operations** with common hand tools, for an identified purpose 1.4 Demonstrate sufficient **maintenance techniques** for the tools used. 4.1 Demonstrate a safe working environment throughout	Small engineering tasks are needed for the 'use of tools'. • What safe working practice must you follow when using each of the tools? • How should you dispose of waste? • In what condition should you leave the working area? • How should you work safely with others around you? Continued in week 21		
Year 1 spring term – 2nd half term					
21	Unit 03		Continued from weeks 19 and 20	Continued from weeks 19 and 20	
22		2.1 Describe common power/portable tools found in an engineering environment	The differences between power and hand tools in engineering. Learners look through suppliers catalogues for those specific to engineering uses. • What tools can you identify? • How and why is that tool used? Possible tool supplier invited into the workshop to demonstrate a range of tools.	Portfolio of evidence unit 03. Internal assessment task – task 2 Witness and observation records can be used alongside reports, annotated photographs and manufacturing reports produced by the learner.	Power tool suppliers catalogues.

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
23 24 25	Unit 03	2.2 Select the most appropriate common power/portable tools for an identified purpose 2.3 Perform operations with common power/portable tools, for an identified purpose 2.4 Demonstrate sufficient maintenance techniques for the tools used 4.1 Demonstrate a safe working environment throughout	A range of tasks are provided from which learners select one each. They have to identify the power tools that would be required for their selected task. Learners need to provide evidence in the form of requisition slips, lists, audio-video or written reports and manufacturing plans explaining why they have selected the power tools, showing the tools being used and explaining what maintenance procedures they would use for each power tool. Learners undertake practical engineering tasks using power tools under supervision. Learners demonstrate following instructions within manufacturers instruction sheets in the maintenance of a range of power tools. • What safe working practice must you follow when using each of the tools? • How should you dispose of waste? • In what condition should you leave the working area? • How should you work safely with others around you?	Sample forms for recording these observations can be found on our website www.ncfe.org.uk/policies-documents/forms-and-documents.	A range of practical tasks to be developed that demonstrate skills using power tools.

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
26 27	Unit 03	1.3 Perform **operations** with common hand tools, for an identified purpose 2.3 Perform operations with common power/portable tools, for an identified purpose	Learners demonstrate a practical application using both manual and power tools to produce a simple engineering product.	Development of practical skills. Opportunity to mop up observation records in support of assessment.	Practical combined engineering tasks to be developed that engage learners.
Year 1 summer term – 1st half term					
28	Unit 03	3.1 Describe common fixed equipment found in an engineering environment 3.2 Select the most appropriate common fixed equipment for an identified purpose 3.4 Demonstrate sufficient maintenance techniques for the equipment used	Learners are taken on a tour of an engineering workshop and interview the workshop supervisor or other staff • What fixed tools can you identify? • How and why is that tool used? • What supplier instructions or basic rules should be followed with regards to operation and safety?	Portfolio of evidence unit 3. Internal assessment task – task 3 Witness and observation records can be used alongside reports, annotated photographs and manufacturing reports produced by the learner. Sample forms for recording these observations can be found on our website www.ncfe.org.uk/policies-documents/forms-and-documents.	
29 30 31		3.1 Describe common fixed equipment found in an engineering environment 3.2 Select the most appropriate common fixed equipment for an identified purpose 3.3 Perform operations with common fixed equipment, for an identified purpose 3.4 Demonstrate sufficient maintenance techniques for the equipment used	Learners are given a task to complete. They have to identify the fixed tools that would be required for their selected task. Learners need to provide evidence in the form of requisition slips, lists, audio-video or written report and manufacturing plans explaining why they have selected the tools, showing the tools being used and explaining what maintenance procedures they would use for each tool.		Requisition orders for time on a machine. A range of practical tasks to be developed that demonstrate skills using fixed equipment.

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
31	Unit 03	3.1 Describe common fixed equipment found in an engineering environment 3.2 Select the most appropriate common fixed equipment for an identified purpose 3.3 Perform operations with common fixed equipment, for an identified purpose 3.4 Demonstrate sufficient maintenance techniques for the equipment used	Teacher to provide practical tasks using a range of fixed equipment, for example: • pedestal drill • lathe • milling machine • band saw • grinder		
32		4.1 Demonstrate a safe working environment throughout	What safe working practice must you follow when using each of the tools? How should you dispose of waste? In what condition should you leave the working area? How should you work safely with others round about you?		

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
Year 1 summer term – 2nd half term					
33 34	Unit 02	1.1 Distinguish between the common **systems** of measurement in engineering drawing	Learners and Teacher discussion on what an engineering drawing contains using examples. Review a range of different technical drawings that use both imperial and metric units. Look at industrial components large and small, boats, cars, buildings, bridges, landscapes and furniture etc. Where would you find imperial being used? – old British & American		
		1.2 Describe how **measuring devices** are used in engineering drawing 1.3 Describe the purpose of scale and proportion in engineering drawing	Examples of engineering structures are viewed to debate size and proportion to fit onto paper and how this is achieved. Learners should create a table showing the image of the equipment and the purpose of the equipment. This could include both traditional drawing equipment and all of the digital equipment that is now used to produce drawings.		

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
35	Unit 02	2.1 Demonstrate the correct layout of a design sheet for **2D and 3D engineering drawings**	Learners are provided with examples of engineering drawings to show the standards that have to be detailed. Learners examine drawing sheets A4, A3, A2, A1, A0, title block, borders and frames, drawing formats, types of drawings, parts/items list, marking to a standard, relevant standards – BN EN ISO ****, associated clauses.		Engineering drawings need to be sourced.
36		2.2 Apply appropriate scales to all drawings	Learners will choose a scale for their technical drawing and be able to justify the choice. Learners will need to be taught how to use traditional and digital application software drawing equipment, as well as producing a hard copy of the drawing using standard traditional methods or a (pen plotter) printer.		
37		2.3 Demonstrate the accurate use of drawing tools and equipment	Teacher demonstration of the techniques that are required and the standards that apply to the production of engineering drawings. Learners produce a scaled drawing for an engineering component.		Prepare exemplar drawings.
38					
Year 2 autumn term – 1st half term					
1	Unit 02	2.4 Present their final 2D and 3D engineering drawings showing evidence of the process involved in its production	Learners continue to finalise the drawing for their component.		

Week	Unit number	Assessment criteria	Teaching and learning activities	Assessment	Notes
2	Unit 02	2.2 Apply appropriate scales to all drawings 2.3 Demonstrate the accurate use of drawing tools and equipment 2.4 Present their final 2D and 3D engineering drawings showing evidence of the process involved in its production	Learners work on a drawing layout and annotated title block to a Teacher-led specification.	Working towards a standard for the external assessment.	Development of independent drawings skills with minimal guidance.
3			Learners produce a drawing of a small engineering product using drawing standards and conventions.	Feedback from Teacher on quality and compliance with standards.	Teacher to prepare a range of sketches for learners to detail in their drawings.
4					
5			Practice external assessment – task 1 – 45 mins	Formal mock assessment under exam conditions. Practice papers can be found on the qualification page.	
6			Practice external assessment – task 2 – 2 hours		
7			Practice external assessment – task 3 – 2 hours		
Year 2 autumn term – 2nd half term					
8			Feedback and revisions		
9	Unit 02		External assessment	External assessment unit 02. First attempt – task 1 – 45 mins and task 2 – 1 hour NB you will need a 3 hour lesson.	Please check assessment dates for your academic year on our website www.ncfe.org.uk/schools/key-stage-4-v-certs.
10			External assessment	External assessment unit 02. First attempt – task 3 – 2 hours	

Week	Unit number	Learning outcome(s)	Teaching and learning activities	Assessment	Notes
11	Unit 04	1.1 Describe engineering **materials** and their **properties** 1.2 Select the most appropriate engineering materials for an identified **purpose** 2.1 Perform a range of techniques used to prepare the selected engineering materials for use	Introduction to unit 04. Learners will look at various engineering materials and their properties. Various purposes will be presented and the learners will be asked to identify the most appropriate materials for each. This could be done in small groups. Teacher will explain and demonstrate and materials are prepared for use.		
12					
13		2.2 Perform a range of marking out techniques for the selected engineering materials	Learners should be introduced to a range of marking out techniques including the use of engineering blue and an engineering scribe and centre punch.		
14					

Week	Unit number	Learning outcome(s)	Teaching and learning activities	Assessment	Notes
Year 2 spring term – 1st half term					
15	Unit 04	1.1 Describe engineering **materials** and their **properties** 1.2 Select the most appropriate engineering materials for an identified **purpose** 2.1 Perform a range of techniques used to prepare the selected engineering materials for use 2.2 Perform a range of marking out techniques for the selected engineering materials	Introduce the internal assessment task. Learners could be given an engineered product or could be guided in selecting their own. They should identify their product and select the materials they will use, providing descriptions of their properties and stating why they have selected them.Their materials should be prepared for use and marked out.	Portfolio of evidence unit 04. Internal assessment task – task 1 Witness and observation records can be used alongside learner evidence. Sample forms for recording these observations can be found on our website www.ncfe.org.uk/policies-documents/forms-and-documents. Continued in weeks 21 and 22.	You may wish to create your own internal assessments or sample internal assessment task can be found on the qualification page on our website. This task can be used directly or altered to suit your school.
16 17		2.3 Perform a range of processes to modify the selected engineering materials to shape and size	Learners should be introduced to a range of processes including filing, sanding, bending, folding.		
18 19		2.4 Perform a range of correct joining methods for the selected engineering materials	Learners should be introduced to a range of joining methods which could include, screwed, rivet and bolted finishes and folded joints.		
20		2.3 Perform a range of processes to modify the selected engineering materials to shape and size 2.4 Perform a range of correct joining methods for the selected engineering materials	Learner should apply the techniques they have learnt to their engineered product.		

Week	Unit number	Learning outcome(s)	Teaching and learning activities	Assessment	Notes
Year 2 spring term – 2nd half term					
21 22	Unit 04	2.5 Perform a range of finishing techniques for the selected engineering materials	Learners should be introduced to a range of finishing methods which could include filing, emery paper and buffing and should apply them to their product.	Portfolio of evidence unit 04. Internal assessment task – task 1 Continued from weeks 15 – 20	
23 24	Unit 03		Revision for unit 03 if needed or mop up session for unit 04.		
25				External assessment unit 02. Second attempt – task 1 – 45 mins and task 2 – 1 hour NB you will need a 3 hour lesson.	Please check assessment dates for your academic year on our website www.ncfe.org.uk/schools/key-stage-4-v-certs.
26 27				External assessment unit 02. Second attempt – task 3 – 2 hours	
Year 2 summer term – 1st half term					
28	Unit 04		Completion of internal assessment.		
29	Units 01, 03 and 04		Mop up sessions used to address any areas of evidence that does not meet the assessment criteria. Assessment feedback reviewed. Opportunities to complete workshop items. Stretch and challenge sessions for higher level learners. Opportunities for a site visit to an engineering sector.	All internally assessed units	

Week	Unit number	Learning outcome(s)	Teaching and learning activities	Assessment	Notes
30	Units 01, 03 and 04		Mop up sessions		
31	Units 01, 03 and 04				
32	Units 01, 03 and 04				
Year 2 summer term – 2nd half term					
33			Revision sessions for other subject areas.		
34			Progression onto Level 3		
35					
36					
37					