

# Blended learning approach to delivering BTEC International qualifications

September 2021 to August 2022

***Engineering***

***Guidance for BTEC International Level 2 and 3 qualifications***

Teaching, learning and assessment

# Engineering

## Introduction

As COVID-19 may continue to impact upon teaching, learning and assessment through the academic year, affecting those learners who are part-way through their qualifications and those who are commencing this academic year, we have produced this guidance to support the effective delivery of BTEC course content. We are committed to ensuring that learners continue to benefit from the breadth of content of BTEC qualifications through adaptations in teaching and learning.

This document is intended to provide you with guidance for how you might adapt delivery for the sector's BTEC qualifications in the academic year of 2021-2022.

We will continue to work with our regulators and relevant sector bodies on any possible adaptations or accommodations in line with the relevant policy and regulatory considerations. Key aspects such as social distancing, safety, lost teaching time, subject content and practical activities have been considered from a sector perspective for your reference. However, it should be

noted that all of the guidance provided here must be considered within the context of any relevant guidance issued by your own centre, relevant governing and industry bodies, local and national government.

For further advice and guidance, please refer to the Teaching, Learning and Assessment pages on [Pearson's website](#) or contact us via the [Customer Support portal](#).

We look forward to continuing to support you and your learners throughout this challenging time and wish you well for the coming year.

## Resources

To help you with the delivery of a blended-learning programme, several resources are available. You can purchase digital *Study Texts* and *Teacher Resource Packs* from our website [here](#) to support you with the delivery of our Level 3 International qualifications (2021).

Additionally, there are free resources available [here](#), that support the delivery of Level 3 (2010) QCF qualifications in

# Engineering

some sectors. Note that to enter this page you will first need to accept the Terms and Conditions.

Units with resources available will be marked according to the following key:

\* Study Text

† Teacher Resource Pack

‡ QCF Guides

# Engineering

## Contents

### Engineering

- **Overview of impact on sector**
- **Qualifications**
  - BTEC Internationals Level 3 in Engineering (2020)
  - BTEC Nationals Level 3 in Engineering (2010 QCF)
  - BTEC Internationals Level 2 in Engineering (2014)

# Engineering

## Overview: Engineering

### Adaptations to Assessments in 2021/2022

Please refer to the assessment section on the [International BTEC Adaptations page](#) for adaptations to assessments and qualifications for the 2021-2022 Academic Year.

***Please note that not all qualifications can or will be adapted, and it is important that you refer to the relevant adaptation guidance for 2021-2022.***

Some qualifications will not be adapted for one of the following reasons:

- An adaptation would impact the reliability and validity of the qualification
- The qualification is a licence to practice or primary purpose is progression to the workplace.

### Learner eligibility

There are currently no plans to have these adaptations extend to learners who take assessments in 2022/23, regardless of when they are due to certificate.

Adaptations are only available in this academic year, for assessment due to take place between 1 September 2021-31 August 2022.

### Social Distance

The delivery and assessment of these programmes does occasionally require group work or close proximity between learners, especially when learners work in pairs/small groups. A small number of assessments do require close proximity (e.g. teamwork during engineering processes). Centres will need to have measures in place to enable these to be carried out safely. Where this is not possible, the use of simulations would be acceptable during the present COVID-19 situation. However, where assessment criteria require learners to undertake practical work (e.g. use of assessment command verb 'demonstrate' or 'carry out') a simulation is not acceptable. Theory can be delivered by distance/blended learning methods and in some contexts (e.g. the Open University) this is the normal way of working.

# Engineering

## Safety

Care is needed if an attempt is made to carry out practical work at home. This will not usually be possible. For example, laboratory work will probably require fewer learners in the lab, which may make the situation safer. However, lone working should not be attempted.

## Lost time teaching

Centres must focus on ensuring that learners have an adequate foundation for the units that will be delivered in 2021-22. Learners will probably have missed some teaching during early to mid 2021 and tutors will need to in-fill as they deliver the programmes during 2021-22. This will require careful planning, particularly on programmes in which the learners were in other settings during 2020-21 and are likely to have had varied experiences (e.g. those who start BTEC level 3 in Year 11 in September 2021).

## Flexibility of delivery and assessment

There is considerable latitude for the use of diverse delivery models and assessment models. Most assessments can employ written reports, presentations, posters, video or audio recordings and other methods and these can be used in remote delivery. Visits to industries are valuable but not mandatory and work experience is not

required in these programmes. The focus on technical and specialist skills must be retained, especially for Level 3 learners that are looking to progress into industry or higher education. In some cases, it may mean that learners cannot access industry standard equipment during this academic year; for example, as web-based software may have more limited functionality.

The learners' time in the centre should focus on the use of specialist equipment in workshops and laboratories, which will allow for skills building in these areas. The theoretical content is more suited to remote teaching and learning for which tasks and research can be set and written submissions are often appropriate. Centres should also make use of diverse evidence types including written reports, presentations, posters, simulations and audio-visual recordings during teaching, learning and assessment.

Importantly, centres should evaluate the range of optional units being delivered during this academic year, as in some cases it may be advantageous to deliver units with a more theoretical/analytical content/bias.

# Engineering

## **What is important to retain the validity of the sector's qualifications?**

As contact time between staff and learners may be limited, centres should prioritise contact time for practical work, as theory can be delivered remotely. Centres may decide to deliver optional units which do not require practical work in assessment.

## **Are there other methodologies that can be used to support the purpose of the qualification?**

As long as practical work is employed where required, a wide range of assessment methods can be used in these programmes. However, time-constrained assessments are likely to be a poor substitute for other methods as they present inappropriate barriers to the demonstration of required learning outcomes. Assessment tasks for practical outcomes should be prioritised during centre-based time and learners can also submit their work remotely via Google (for example) or other Virtual Learning Environment (VLE) platforms.

# Engineering

## Teaching, Learning and Assessment: Engineering

Unit Title	Remote delivery (✓ / X / partially)	Socially distanced (✓ / X)	Delivery Guidance
<b>BTEC Internationals Level 3 (2021) – Engineering</b>			
*Unit 1: Mechanical Principles (Pearson set assignment)	✓	✓	<p>The teaching and learning of the content for this unit could be delivered remotely. There are some Distance Learning centres that already do this.</p> <p>The Pearson Set Assignment (PSA) must be carried out under supervised conditions in the centre, so that the authenticity of the outcomes can be assured.</p> <p>Centres can stagger the assessment based on sub-groups of learners if classroom capacity is reduced for social distancing, but will need to take extra care in ensuring that the submitted evidence is authentic and has not been plagiarised.</p>
*Unit 2: Delivery of Engineering Processes Safely as a Team	Partially	✓	<p>Learning aim A could be delivered remotely.</p> <p>Learning aim B could be delivered remotely if the IT infrastructure (hardware and software) supports it.</p> <p>Learning aim C will need to be delivered in a workshop and note that the assessment takes place in groups of 3 or 4 learners. Reduced workshop capacity for social distancing/extra cleaning may mean that the delivery of</p>



# Engineering

			<p>this Learning aim will be based on sub-groups and staggered. There is no definitive requirement to deliver the Learning aims sequentially.</p> <p>If the IT infrastructure (hardware and software) supports it, Learning aim B can be assessed remotely with electronic submission of the required evidence.</p>
*Unit 3: Product Design and Manufacture in Engineering (Pearson set assignment)	✓	✓	<p>This is a synoptic unit, so it is advisable to deliver it during the second half of the qualification programme if possible. The unit could be delivered remotely with suitable formative feedback during the teaching and learning.</p> <p>The Pearson Set Assignment (Parts A and B) must be carried out under supervised conditions in the centre, so that the authenticity of the outcomes can be assured.</p> <p>Centres can stagger the assessment based on sub-groups of learners if classroom capacity is reduced for social distancing, but will need to take extra care in ensuring that the submitted evidence is authentic and has not been plagiarised.</p>
*Unit 4: Applied Commercial and Quality Principles in Engineering	✓	✓	<p>This unit requires no use of physical equipment or tools/workshops or laboratories and so could be delivered remotely.</p> <p>The Learning aims can be assessed remotely with electronic submission of the required evidence.</p>
*Unit 5: A Specialist	Partially	✓	<p>The project unit draws together learning from across the programme, so it is advisable to deliver it later in the programme if possible. The Project Supervisor will have a major role here in advising what the learner can or</p>

# Engineering

Engineering Project			cannot do for Learning aim C in particular, where the learner has to generate/test a solution; clearly, access to physical equipment or tools/workshops or laboratories may be limited. Learning aims A and B could be delivered remotely.
*Unit 6: Microcontroller Systems (Pearson set assignment)	Partially	✓	<p>A proportion of the content in this unit could be delivered remotely depending on the IT infrastructure (hardware and software) available; however, learners will still need some face-to-face delivery/teaching and learning when assembling/operating/testing microcontroller systems (for Learning aim B in particular). Delivery of this aspect of the unit may be based on sub-groups and staggered for social distancing/extra cleaning.</p> <p>The Pearson Set Assignment must be carried out under supervised conditions in the centre, so that the authenticity of the outcomes can be assured.</p> <p>Centres can stagger the assessment based on sub-groups of learners if electronic laboratory capacity is reduced for social distancing, but will need to take extra care in ensuring that the submitted evidence is authentic and has not been plagiarised.</p>
*Unit 7: Calculus to Solve Engineering Problems	✓	✓	<p>The teaching and learning of the content for this unit could be delivered remotely. There are some Distance Learning centres that already do this.</p> <p>The Learning aims can be assessed remotely with electronic submission of the required evidence.</p>

# Engineering

			Learners can be given the same questions/problems to solve; however, to ensure the authenticity of outcomes, centres should use data sets so that the values in the said questions/problems are different for each learner.
*Unit 10: Computer Aided Design in Engineering	✓	✓	<p>The whole unit could be delivered remotely if the IT infrastructure (hardware and software) supports it.</p> <p>If the IT infrastructure (hardware and software) supports it, the Learning aims can be assessed remotely with electronic submission of the required evidence.</p> <p>Centres will need to take extra care in ensuring that the submitted evidence is authentic and has not been plagiarised.</p>
*Unit 19: Electronic Devices and Circuits	Partially	✓	For this unit, the 'build (make) and test' content will need some face-to-face delivery/teaching and learning; however, other content could be delivered remotely, dependent upon the IT infrastructure (hardware and software) available (such as the 'simulation' content). This suggests a blended approach would be suitable.
*Unit 57: Electrical and Electronic Principles (Pearson set assignment)	✓	✓	<p>The teaching and learning of the content for this unit could be delivered remotely. There are some Distance Learning centres that already do this.</p> <p>The Pearson Set Assignment must be carried out under supervised conditions in the centre, so that the authenticity of the outcomes can be assured.</p> <p>Centres can stagger the assessment based on sub-groups of learners if classroom capacity is reduced for social distancing, but will need to take extra</p>

# Engineering

			care in ensuring that the submitted evidence is authentic and has not been plagiarised.
<b>General comments:</b> Given that this is a suite of post-16 qualifications the general guidance here is that centres can make use of remote learning wherever possible/practicable for those units/Learning aims that do not require access to physical equipment or tools/workshops or laboratories. The majority of units in this suite of qualifications have at least one Learning aim that is practical in nature. A blended learning approach would suggest that centres could timetable learners for face-to-face delivery/assessment where there is a specific need for it. The practical aspects of these Learning aims may well need to be delivered and assessed using sub-groups due to reduced workshop/laboratory/IT suite capacity (for social distancing/extra cleaning) and therefore starting the delivery/assessment of these Learning aims early will ensure that all learners have equal opportunities. Centres can also clearly make choices about optional units that may mean access to physical equipment or tools/workshops or laboratories is less of an issue.			

# Engineering

Unit Title	Remote delivery (✓ / X / partially)	Socially distanced (✓ / X)	Delivery Guidance
<b>BTEC Nationals Level 3 (2010 QCF) – Engineering</b>			
‡Unit 1: Health and Safety in the Engineering Workplace	✓	✓	<p>The unit content allows for remote learning delivery.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p>
‡Unit 2: Communications for Engineering Technicians	✓	✓	<p>The unit content allows for remote learning delivery. It is possible to deliver this unit in parallel with Unit 3: Engineering Project.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p> <p>It is not necessary for learners to perform the delivery of a presentation for criterion P7; however, if centres require learners to do this it could be done over a suitable online platform.</p> <p>Many centres already require learners to use assessment evidence generated for Unit 3 to address several of the criteria for this unit, and that continues to be acceptable.</p>
‡Unit 3: Engineering Project	Partially	✓	<p>The project unit draws together learning from across the programme, so it is advisable to deliver it later in the programme if possible (possibly in parallel with Unit 2: Communications for Engineering Technicians). The Project</p>

# Engineering

			Supervisor will have a major role here in advising what the learner can or cannot choose to focus on; clearly, access to physical equipment or tools/workshops or laboratories may be limited.
‡Unit 4: Mathematics for Engineering Technicians	✓	✓	<p>The content for this unit could be delivered remotely. There are some Distance Learning centres that already do this.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p> <p>Learners can be given the same questions/problems to solve; however, to ensure the authenticity of outcomes, centres should use data sets so that the values in the said questions/problems are different for each learner.</p>
‡Unit 5: Mechanical principles and Applications	✓	✓	<p>The content for this unit could be delivered remotely. There are some Distance Learning centres that already do this.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p> <p>Learners can be given the same questions/problems to solve; however, to ensure the authenticity of outcomes, centres should use data sets so that the values in the said questions/problems are different for each learner.</p>
‡Unit 6: Electrical and Electronic Principles	Partially	✓	The content for this unit could be delivered remotely with some face-to-face delivery for the experimental/testing activities. The practical activities are not the major focus of the unit and tutor demonstrations could be delivered online during teaching and learning. There is no definitive requirement to deliver the Learning outcomes sequentially, so the experimental/testing content could be

# Engineering

			<p>delivered to sub-groups of learners (face-to-face) with the more theoretical content being taught concurrently to the whole group (remotely). Some professional judgement and knowledge of the capability of individual learners is required here, as some will benefit from sequential delivery of the Learning outcomes.</p> <p>Most of the criteria can be assessed remotely with electronic submission of the required evidence.</p> <p>Where calculations are required, learners can be given the same questions/problems to solve; however, to ensure the authenticity of outcomes, centres should use data sets so that the values in the said questions/problems are different for each learner.</p>
‡Unit 10: Properties and Applications of Engineering Materials	Partially	✓	<p>The content for this unit could be delivered remotely with some face-to-face delivery for the testing activities. The practical activities are a minor aspect of the unit and tutor demonstrations could be delivered online during teaching and learning. The testing content could be delivered to sub-groups of learners (face-to-face) with the more theoretical content being taught concurrently to the whole group (remotely).</p>
Unit 17: Computer Aided Drafting in Engineering	✓	✓	<p>The whole unit could be delivered remotely if the IT infrastructure (hardware and software) supports it.</p> <p>If the IT infrastructure (hardware and software) supports it, the criteria can be assessed remotely with electronic submission of the required evidence.</p>

# Engineering

			Centres will need to take extra care in ensuring that the submitted evidence is authentic and has not been plagiarised.
‡Unit 35: Principles and Applications of Electronic Devices and Circuits	Partially	✓	For this unit, the 'build (make), test and modify' content will need some face-to-face delivery/teaching and learning; however, other content could be delivered remotely, dependent upon the IT infrastructure (hardware and software) available (such as the 'simulation' content). This suggests a blended approach would be suitable.

## General comments:

Given that this is a suite of post-16 qualifications the general guidance here is that centres can make use of remote learning wherever possible/practicable for those units/Learning outcomes that do not require access to physical equipment or tools/workshops or laboratories.

A blended learning approach would suggest that centres could timetable learners for face-to-face delivery/assessment where there is a specific need for it. The practical aspects of some Learning outcomes may well need to be delivered and assessed using sub-groups due to reduced workshop/laboratory/IT suite capacity (for social distancing) and therefore starting the early delivery/assessment of these Learning outcomes will ensure that all learners have equal opportunities.

Centres can also clearly make choices about optional units that may mean access to physical equipment or tools/workshops or laboratories is less of an issue.



# Engineering

Unit Title	Remote delivery (✓ / X / partially)	Socially distanced (✓ / X)	Delivery Guidance
<b>BTEC Internationals Level 2 (2014) – Engineering</b>			
Unit 1: Working Safely and Effectively in Engineering	Partially	✓	<p>Some of the 'knowledge-based' unit content allows for remote learning delivery; however, the practical aspects of Outcome of learning 2 in particular require face-to-face delivery (or tutor demonstrations could be delivered online during teaching and learning). The practical content is not extensive and therefore it should be possible to provide learners with suitable access to the workshop/equipment required, notwithstanding social distancing/cleaning requirements.</p> <p>Some of the criteria can be assessed remotely with electronic submission of the required evidence.</p>
Unit 2: Interpreting and Using Engineering Information	✓	✓	<p>The unit content allows for remote learning delivery.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p> <p>Criteria P1, P2, P4 and M1 refer to 'a given task' or 'a given engineering task'. These 'tasks' do not necessitate the use of a workshop/laboratory; for example, for criterion P2 learners could use appropriate drawings and related documentation to complete a maintenance plan for a piece of engineering equipment.</p>

# Engineering

Unit 3: Mathematics for Engineering Technicians	✓	✓	<p>The unit content allows for remote learning delivery.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p> <p>Learners can be given the same questions/problems to solve; however, to ensure the authenticity of outcomes, centres should use data sets so that the values in the said questions/problems are different for each learner.</p>
Unit 4: Applied Electrical and Mechanical Science for Engineering	✓	✓	<p>The unit content allows for remote learning delivery.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p> <p>Learners can be given the same questions/problems to solve; however, to ensure the authenticity of outcomes, centres should use data sets so that the values in the said questions/problems are different for each learner.</p>
Unit 8: Selecting Engineering Materials	✓	✓	<p>The unit content allows for remote learning delivery.</p> <p>The criteria can be assessed remotely with electronic submission of the required evidence.</p>

# Engineering

<p>Unit 10: Using Computer Aided Drawing Techniques in Engineering</p>	<p>✓</p>	<p>✓</p>	<p>The whole unit could be delivered remotely if the IT infrastructure (hardware and software) supports it.</p> <p>If the IT infrastructure (hardware and software) supports it, the criteria can be assessed remotely with electronic submission of the required evidence. Learners may need to take screenshots to provide evidence for some of the criteria (for example, P1).</p> <p>Centres will need to take extra care in ensuring that the submitted evidence is authentic and has not been plagiarised.</p>
<p>Unit 14: Secondary Machining Techniques</p>	<p>Partially</p>	<p>✓</p>	<p>Some of the 'knowledge-based' unit content allows for remote learning delivery with online tutor demonstrations; however, the practical/safety aspects of Outcomes of learning 3 and 4 in particular require face-to-face delivery and the time for learners to develop some skills/capability.</p> <p>Centres will need to make a careful decision here as to whether it is possible to appropriately timetable learners for teaching and learning if the capacity of workshops is reduced due to social distancing/cleaning requirements.</p>

# Engineering

Unit 19: Electronic Circuit Construction	Partially	✓	Some of the 'knowledge-based' unit content allows for remote learning delivery; however, the practical aspects of Outcomes of learning 1 and 4 in particular require face-to-face delivery (or tutor demonstrations could be delivered online during teaching and learning). The practical content is not extensive and therefore it should be possible to provide learners with suitable access to the electronics laboratory/equipment required, notwithstanding social distancing/cleaning requirements.
<p><b>General comments:</b></p> <p>This is a suite of Level 2 qualifications that are delivered to both pre-16 and post-16 cohorts; consequently, learners are likely to need more support. Blended learning may be suitable, but the way a centre approaches the delivery/assessment of the above will need to be more nuanced than the approach for Level 3. If cohort sizes (and social distancing/cleaning requirements) allow it, a greater focus on face-to-face learning may be appropriate. The demand on practical resources/workshops etc that have less capacity due to social distancing/cleaning requirements may mean that unit choice is more restricted/different to previous years.</p> <p>Centres can also clearly make choices about optional units that may mean access to physical equipment or tools/workshops or laboratories is less of an issue.</p>			