Pearson
BTEC

Teaching and learning support during Coronavirus (COVID-19)

Engineering

Guidance for BTEC Nationals, Tech Awards and Firsts

Support

Last updated 15th May 2020

Formal assessment requirements

We have confirmed for BTEC Level 3 Nationals, BTEC Level 1 and 2 Firsts and Tech Awards, where we expect to be able to provide calculated results, we do not require or expect any formal assessment for BTEC to take place while learners are studying at home. We expect to collect centre assessment grades from teachers and tutors for any incomplete work for all learners and these judgements will be used in the calculation of a final result where relevant.

Supporting teaching and learning

Whilst not a requirement we are encouraging and supporting continued learning at home during this time, so when learners return to school or college, progress to HE, an apprenticeship, or work, they have the knowledge and skills they need to continue with confidence. We also recognise the benefits that learning and a structured day have on general health and wellbeing and we want to make sure that we are doing everything we can to best support you and your learners at this time.

Contents:

Qualifications in Engineering that fall into the Calculated Result Category

QN Number	Qualification Title
600/4788/4	Pearson BTEC Level 1/2 First Award in Engineering
600/6628/3	Pearson BTEC Level 1/2 First Certificate in Engineering
600/6630/1	Pearson BTEC Level 1/2 First Extended Certificate in Engineering
601/0545/8	Pearson BTEC Level 1/2 First Diploma in Engineering
603/0829/1	Pearson BTEC Level 1/2 Tech Award in Engineering
600/4324/8	Pearson BTEC Level 1/2 Extended Certificate in Vehicle Technology
600/4341/6	Pearson BTEC Level 1/2 Diploma in Vehicle Technology
500/8156/1	Pearson BTEC Level 3 Certificate in Engineering
500/7841/0	Pearson BTEC Level 3 Subsidiary Diploma in Engineering
600/3888/3	Pearson BTEC Level 3 90 Credit Diploma in Engineering
500/7799/5	Pearson BTEC Level 3 Diploma in Aeronautical Engineering
500/8154/8	Pearson BTEC Level 3 Diploma in Engineering
500/7283/3	Pearson BTEC Level 3 Diploma in Electrical & Electronic Engineering
500/7283/3	Pearson BTEC Level 3 Diploma in Mechanical Engineering
500/7319/9	Pearson BTEC Level 3 Diploma in Manufacturing Engineering
500/7315/1	Pearson BTEC Level 3 Diploma in Operations & Maintenance Engineering
500/7800/8	Pearson BTEC Level 3 Extended Diploma in Aeronautical Engineering
500/8165/2	Pearson BTEC Level 3 Extended Diploma in Engineering
500/8097/0	Pearson BTEC Level 3 Extended Diploma in Electrical & Electronic Engineering
500/7296/1	Pearson BTEC Level 3 Extended Diploma in Mechanical Engineering
500/7314/X	Pearson BTEC Level 3 Extended Diploma in Manufacturing Engineering

500/7317/5	Pearson BTEC Level 3 Extended Diploma in Operations & Maintenance Engineering
500/8099/4	Pearson BTEC Level 3 Extended Diploma in Aircraft Maintenance
600/4344/1	Pearson BTEC Level 3 Subsidiary Diploma in Vehicle Technology
600/4343/X	Pearson BTEC Level 3 Diploma in Vehicle Technology
600/4328/3	Pearson BTEC Level 3 Extended Diploma in Vehicle Technology
603/1197/6	Pearson BTEC Level 3 Certificate in Engineering
601/7584/9	Pearson BTEC Level 3 Extended Certificate in Engineering
601/7591/6	Pearson BTEC Level 3 Foundation Diploma in Engineering
601/7580/1	Pearson BTEC Level 3 Diploma in Engineering
601//7579/5	Pearson BTEC Level 3 Diploma in Electrical & Electronic Engineering
601/7583/7	Pearson BTEC Level 3 Diploma in Mechanical Engineering
601/7582/5	Pearson BTEC Level 3 Diploma in Manufacturing Engineering
601/7577/1	Pearson BTEC Level 3 Diploma in Aeronautical Engineering
601/7588/6	Pearson BTEC Level 3 Extended Diploma in Engineering
601/7587/4	Pearson BTEC Level 3 Extended Diploma in Electrical & Electronic Engineering
601/7590/4	Pearson BTEC Level 3 Extended Diploma in Mechanical Engineering
601/7589/8	Pearson BTEC Level 3 Extended Diploma in Manufacturing Engineering
601/7585/0	Pearson BTEC Level 3 Extended Diploma in Aeronautical Engineering
603/3637/7	Pearson BTEC Level 2 Diploma in Aerospace and Aviation Engineering (Foundation Knowledge)
601/9063/2	Pearson BTEC Level 3 Diploma in Aerospace and Aviation Engineering (Development Technical Knowledge)
601/9053X	Pearson BTEC Level 3 Award in Advanced Manufacturing Engineering (Development Technical Knowledge)
601/9049/8	Pearson BTEC Level 3 Certificate in Advanced Manufacturing Engineering (Development Technical Knowledge)

601/9054/1	Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)
601/9060/7	Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)
603/2537/9	Pearson BTEC Level 3 Diploma in Rail Engineering Technician (Knowledge)
603/3186/0	Pearson BTEC Level 3 Diploma in Composites Engineering

Support for Blending Learning

1. Digital Textbooks and Revision Guides

We're providing **free 90-day access** for your centre to some of our digital learning resources which can be accessed in college or at home.

The following digital Textbook bundles are all available via our online ActiveLearn platform. ActiveLearn provides core textbooks, online homework and practical activities, as well as front-of-class teaching resources, planning and assessment materials. You can allocate as much or as little from the e-Textbooks as you wish to your learners to access wherever, whenever.

Digital textbook bundles:

- KS4 Vocational Qualifications
- KS5 Vocational Qualifications

Revision

- KS4 Revision Guides
- KS5 Revision Guides

If you would like to access these resources please request access here.

2. Online remote-delivery recordings for BTECs

- Introduction to online remote delivery
- Developing resources for online delivery
- Planning and teaching online
- Supporting students studying online

> Find out more

3. Digital Live Event and Recordings

Access recordings from our **Digital Live event: Enabling Education**

> Find out more

4. Get expert guidance from our community of online teaching and learning specialists

A range of free resources including blog articles and webinars to provide support, inspire ideas and enable you to channel your passions and expertise without feeling too overwhelmed. Browse articles and blog content and access via this link.

5. Paid-for Teaching Resources

Pearson Learning Hub

This platform has a range of courses available with content broken down into bitesize learning chunks. It supports blended and online learning via the use of videos, online quizzes and resources that your learner can access.

For some courses, flashcards and infographics break down information further into accessible amounts of information.

Learning programmes currently include:

- **Workplace Behaviours** – soft skills training and development covering areas such as Resilience, Professionalism, Decision-making, Adaptability, Self-Management and Work Ethics.
- **Digital Technologies for non-experts** including Artificial Intelligence for Leaders, Artificial Intelligence De-Mystified and Digital Technology De-Mystified.

>Find out more about Pearson Learning Hub

6. Sector Body Resources

Sector body	Web page
www.engineeringuk.com	Links to support and research articles around engineering
www.theiet.org	Standards, training, industry articles and professional development
www.aerosociety.com	Standards, training, industry articles and professional development
www.thisisengineering.org.uk	Information and case studies about working in engineering and covering a wide variety of engineering sectors
www.hse.gov.uk	Standards, training, industry articles and professional development
www.bbc.co.uk/bitesize/careers	- information and case studies about working in engineering
www.arm.com/resources/education	- resources for school and higher level education in engineering including robotics and programming
www.stem.org	Resources for learners and teachers, including some case studies.

Subject Advisor support and guidance

Subject Advisor: Evren Alibaba

Contact details:

- 0344 463 2824
- https://support.pearson.com/uk/s/qualification-contactus
- Engineering community

BTEC Tech Award in Engineering - an overview -
https://qualifications.pearson.com/content/dam/pdf/btec-tec-awards/engineering/2017/teaching-and-learning-materials/support-session-an-overview.pdf

Recording: https://www.youtube.com/watch?v=QD3DPN54tPE&t=

Teaching and Learning to support transition to second year of a two-year programme

We are continuing to support schools and colleges to enable learners to continue with their studies from home. We are encouraging continued learning so when learners return to school or college they have the knowledge and skills they need to continue with their course.

The information below are examples of the type of content that would have been covered in a typical in year 1 that is needed to support units/ components typically covered in the second year of a study programme

Many of these qualifications require the learners to undertake many practical skills. These practical skills will need to be taught and demonstrated so centres may need to wait until students return before teaching these.

Centres will deliver the mandatory and optional units in varying ways and timings across the course so examples have been suggested as a guide below of alternatives that can be taught until the learners return.

BTEC Nationals QCF

Whilst there is no external assessment within the QCF suite of Engineering Nationals, most centres tend to deliver most of the mandatory units within the first year of delivery. Many of the mandatory units (i.e. Health & Safety, Mathematics, Electrical and Electronic Principles, Mechanical Principles and Communications) are theoretical units and lend themselves to remote delivery utilising videos and presentations to deliver the relevant content. Please note that for remote delivery authentication of learner work must be completed and learners should be reminded of the consequences of plagiarising work.,

For some practical optional units (i.e. Computer Aided Design or Engineering Design) it may still be possible to continue delivery remotely. As centres can either provide

laptops enabled with appropriate CAD software, such as AutoCAD or Solidworks, to learners or learners could download free software, such as DraftSight. Please note that DraftSight is compatible with AutoCAD. – Free CAD software (http://draftsight.com).

Where units require additional equipment such as Engineering Primary Forming Processes and Engineering Secondary and Finishing Techniques, basic underpinning knowledge can be provided using videos and presentations. However, practical application and learning may have to be delayed for first year learners until they can return to the engineering workshop.

BTEC Nationals RQF

Learners completing a one or two year BTEC National (2016) in Engineering programme, are unlikely to have taken the external assessment for Unit 1: Engineering Principles or Unit 3: Engineering Product Design and Manufacture in January 2020. Consequently, for learners on a one year programme, these grades will be calculated, and learners on a two year programme will have a further two opportunities to sit these assessments in January and May/June 2021.

Where theoretical units were planned to be delivered between March and July on a two year programme, our recommendation is to alter the scheme of work and related lesson plans to focus on delivering underpinning theoretical content of units, delaying any learning and assessment of practical application until such time that the learner can return to a laboratory/workshop setting.

For learners looking to learn about computer aided design (Unit 10), either laptops with appropriate CAD software, such as AutoCAD or Solidworks, could be provided to learners or learners could be encouraged to download free software such as DraftSight, which is compatible with AutoCAD. (See http://draftsight.com). This could then be used to deliver practical learning activities ready for completing assessments on their return in the next academic year.

Tech Awards

The scheme of work that is available on our website for delivering the Tech Award in Engineering is already heavily based on theoretical delivery (Teaching and Learning Support), so could be used with Year 10 learners who will be continuing with their delivery in the next academic year.

Component 1 is usually delivered and assessed in the first year with component 2 commencing at the end of year 1 and progressing into year 2.

For Component 2, tutors could set learning activities for Learning Aim A by using images of components that learners could research and analyse in the materials used, the components and possible manufacturing processes that were used to manufacture the product.

For Learning Aim B, tutors could provide CAD diagrams or images of disassembled products for learners to research and identify the component parts in preparation for them returning to the workshop to carry out a practical disassembly. They could also watch videos on YouTube of people disassembling items such as PlayStation 4 controllers (https://www.youtube.com/watch?v=qWSqe33aiYI) or a drone (https://www.youtube.com/watch?v=lMfj8XBdwuw) to give them an understanding of disassembling complex electronic devices and equipment. There are many videos on the disassembly of devices and equipment, both mechanical and electronic, and the learner could be asked to research and review different types of disassembly videos and be prepared to talk about these in the next virtual classroom activity.

Learning Aim C is a practical activity that will need to be delayed until the learner returns to the classroom/workshop

Component 3 is the synoptic unit and should be delivered upon completion of Component 1 and 2 so that the learners can draw on the knowledge and skills gained in those units. It is unlikely that a learner at the end of year one would be ready to have the content of this unit delivered. Learners, currently in year one, will have two opportunities to sit the assessment in February and May/June 2021.

Approaches for remote learning

Our expectation is that centres will continue to provide teaching and learning of as much of the BTEC specification unit content as is possible and carry out teacher based assessments (e.g. worksheets, questions, activities etc) to help prepare learners for the next stage of their journey.

We do not expect learners to complete any formal BTEC Assignment Briefs for BTEC Level 3 Nationals, BTEC Level 1 and 2 Firsts and Tech Awards between mid-March and July.

The table provides some examples of adapted approaches to providing learners with activities that allow for feedback and support continued teaching and learning.

Alternative Remote Learning Approaches	
Assessment Technique	**Indicative Alternative Assessment**
Case study (physical submission)	Case study (online submission or electronic submission by email)
Discussion forum (in class, verbal)	Virtual meetings (Google class, Microsoft Teams, Zoom, FaceTime, Skype or equivalent platforms)
Discussion forum (written)	Online chat (Google class, Microsoft Teams, Zoom, FaceTime, Skype, VLEs, blogs or equivalent platforms)

Experiment (lab based; face-to-face)	Report on results of the experiment provided by the tutor
Independent research report (physical copy)	Independent research report (online submission or electronic submission by email)
Question and Answer Session	(Google classroom, Microsoft Teams, Zoom, Skype or equivalent platforms)
Peer review (written, in class)	Peer review report (online submission or electronic submission by email)
Presentation (face-to-face, in class)	Presentation (live via Google classroom, Microsoft Teams, Zoom, Skype or equivalent platforms Presentation (recorded online submission or electronic submission by email)
Self-reflection	Self-reflection (online submission or electronic submission by email)
Simulated activity (in class demonstration)	Individual report (online submission or electronic submission by email)
Team formative assessment activities (verbal, in class)	Team assessment (live via Google classroom, Microsoft Teams, Zoom, FaceTime, Skype or equivalent platforms) Team assessment (report, online submission or electronic submission by email) Individual assessment (report, online submission or electronic submission by email)
Written task/report (physical submission)	Written task/report (online submission or electronic submission by email)

How to approach research

Students working on research activities requiring primary research may find it challenging in the current climate. However, when used correctly the internet can be a good source for scholarly journals, current news, books, credible magazines, general information and other relevant content to help with research-based activities.

Primary Data Collection

Typically, activities such as interviews, focus groups, observations, etc. would be conducted in a face-to-face environment. Alternative methods to conduct primary research could include:

- Utilising video conferencing software to host focus groups, observations and interviews
- Arranging a phone conversation for direct interviews
- Utilising Live Messaging systems or software such as MS Teams to conduct research amongst peers
- Engaging in email correspondence

Using social media networks to gauge feedback or interest i.e. consumer voice. Using online surveys is another approach which is relatively simple to set up. Several free online survey tools are readily available to design and send out to wide range of participants. Common survey platforms include:

- **Google Forms** – http://forms.google.com
- **SurveyMonkey** - http://surveymonkey.com
- **SmartSurvey** - https://www.smartsurvey.co.uk

Secondary Data Collection

Where primary data collection may not be possible, or necessary, students may be directed to use secondary research; which can support the original hypothesis being examined. Many online journals offer free access to scholarly articles and peer reviewed journals. To ensure reliability look for reputable sources online. Many reliable statistics, articles and other information can be found on government and educational websites.

In addition, an Internet search for only scholarly information will reveal further sources. Some open access journals which feature topics across several areas are:

- **DOAJ** - https://doaj.org/

  DOAJ features more than 8,500 open access journals, many of which are sourced from government, commercial, non-profit, and for-profit sources.

- **Oxford Open** - https://academic.oup.com/journals/pages/open_access

  Oxford Open's database is comprised of archived content from more than 300 publications. The majority of these journals are fully open access, and the site also provides an array of optional open access entries (articles with publication costs paid by the author) that users may also access free-of-charge.

- **Omics Group -** https://www.omicsonline.org/open-access-journals-list.php

  More than 300 open-access scientific journals on life sciences, pharmacology, environmental science, management, computer science and engineering.

For a full list of open access journals by subject go to-
https://www.onlineschools.org/open-access-journals/

Many professional bodies and professional membership organisations also publish research studies, case studies and information that students may use to support their research. Typically, these sources will be reliable and relevant. Centres are encouraged to ensure that students are aware of the professional bodies and membership organisations that are relevant to their field of study.

How to approach the use of software

Centres are encouraged to provide students with guidance as to suitable free or low-cost software that may be used to undertake work. For example:

- **DraftSight** – Free CAD software (compatible with AutoCAD) (http://draftsight.com)
- **Autodesk Free Education software**, including AutoCAD, Fusion, inventor...etc (https://www.autodesk.com/education/free-software/featured)
- **LightWorks** – Free video editing software (http://lwks.com)
- **Scribus** – Free digital page layout alternative to InDesign (https://www.scribus.net)
- **LibreOffice** – Free word processing, spreadsheets, presentation software (compatible with Microsoft Office) (http://libreoffice.org)

There are many free or low-cost alternatives available. Many software vendors provide free versions of software for students. Searching on the Internet will result in extensive lists.

Some large, industry-standard software vendors provide free versions of their software for education. Two of the most common are:

- **Microsoft** – Word, Excel, Powerpoint and other are available for free. (https://www.microsoft.com/en-us/education/products/office)
- **AutoDesk** – AutoCAD, Revit, Maya, 3DS Max, Inventor and many others are available for free download. (https://www.autodesk.com/education/free-software/featured)