

Your guide to the changes for 2021

Following [Ofqual's consultation](#) on arrangements for the assessment of VTQs in 2020/21, we've reviewed units in our Cambridge Nationals and Cambridge Technicals being taken this academic year to provide specific guidance at qualification and unit level on changes to requirements or alternative approaches to support public health guidance.

Our changes are designed to make units to be taken in 2020/21 possible to complete, given the constraints you are all working with, and to make sure that the learning outcomes and assessment criteria can still be met.

We understand that the current disruption continues to change and also varies across regions, so our guidance gives acceptable alternatives you can consider when delivering units in your school /college while following the public health guidance.

Please use the [specification and assignments](#) available on our website, alongside this document, to plan and carry out assessment in 2020-21.

General notes

To meet social distancing requirements, workshop access in most centres is likely to be limited. The adaptations described here suggest alternatives to using the workshop for teaching and assessment. However, because the qualification is practical, it is not possible to remove workshop use from the requirements.

Where centres would normally teach in the workshop, we suggest they pre-prepare teaching videos from the workshop to support classroom lessons and any remote learning.

Platforms available to deliver taught elements include SketchUp and FreeCAD. If centres use third party supporting programmes for remote working, they should also have relevant supporting resources to guide candidates in developing the portfolio evidence needed for the specification criteria.

When candidates need to use the workshop, centres should encourage group/bubble work to help manage the workshop time constraints.

In some cases, the assessment tasks could be completed remotely. In this case, centres will need to authenticate work further using a candidate presentation or a question and answer session. Details are given below where relevant. Remote work must also be accompanied by a witness statement.

Suggested adaptations

Unit number(s) and title(s)	Learning objectives (LO)	Criteria	Issues identified in the unit(s)	Adaptations / solutions
Unit 3 Mechanical engineering - machine operations	LO2	<p>P3 Preparing working environment prior to performing engineering activities</p> <p>P4 Follow safe working practices when performing engineering activities</p>	<p>Limited access to workshops.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p>	<p>Centres could use setting-up videos to support teaching and reduce time in the workshop.</p> <p>Centres could assess P3 through a written report or presentation, as detailed in Task 2 of the model assignments. They could use their own video or workshop images and annotate them with area prep/safety practices.</p> <p>P4 will need workshop use, in centre-agreed work group bubbles.</p>
	LO4	P6 Prepare and mark out an engineered component(s) from information given in an engineering drawing	<p>Limited access to workshops.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p>	<p>If possible, centres could use marking out equipment in the classroom rather than the workshop, for some parts of components.</p> <p>In the workshop, candidates should work in small centre-agreed group bubbles.</p>
	LO5	<p>P7 Select and use appropriate tools for accurate drilling and turning, or drilling and milling</p> <p>P8 Select and use work holding devices for accurate drilling and turning or drilling and milling</p>	<p>Limited access to workshops.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p>	<p>This LO needs workshop access. To help reduce the time spent in the workshop, centres could consider the following:</p> <ul style="list-style-type: none"> Using different drawings/components for group bubbles to minimise social contact in workshops. One bubble could drill and mill and another could turn and drill. Using jigs or fixtures to hold or clamp multiple products to reduce workshop time for some machining processes. Candidates could document and discuss their use to further support M4 criteria. Using relevant hand fitting processes to reduce workshop time.

Unit number(s) and title(s)	Learning objectives (LO)	Criteria	Issues identified in the unit(s)	Adaptations / solutions
	LO6	<p>P9 Set correct parameters prior to machine operations and during machining</p> <p>P10 Produce machined component(s) that demonstrate drilling and turning or drilling and milling machine operations</p>	<p>Limited access to workshops.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p>	<p>For P9, candidates can demonstrate the task through a written report or presentation, as detailed in Task 4 of the model assignment.</p> <p>P10 needs workshop access. To help reduce the time spent in the workshop, centres could consider the following:</p> <ul style="list-style-type: none"> • Group work in bubbles to set correct parameters for machining, and so on. Candidates could use documented images of set-ups. • Using different drawings/components for group bubbles to minimise social contact in workshops. One bubble could drill and mill and another could turn and drill. • Possible use of relevant hand fitting processes to reduce workshop time. • P11, M5 and D2 are tolerance related. The checking, explanation and evaluation of machined products could be supported by bubble group tolerance data, comparisons and compliance.
<p>Unit 4 Electrical, and electronic engineering - operations and application</p>	LO2	<p>P4 Safely use tools to construct a circuit</p> <p>P5 Construct a circuit from a circuit diagram using appropriate component assembly and construction techniques</p>	<p>Limited access to workshops.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p> <p>There are practical elements that cannot be remotely delivered.</p>	<p>Candidates could work in centre-agreed bubble groups to assemble circuits.</p> <p>Candidates could assemble components in a classroom. They could pre-order components, which could be delivered in sealed bags. Candidates would need support from technicians to collate components, and extra time to sanitise components.</p>

Unit number(s) and title(s)	Learning objectives (LO)	Criteria	Issues identified in the unit(s)	Adaptations / solutions
	LO3	<p>P6 Use data to perform functionality checks on electronic circuit(s)</p> <p>P7 Use appropriate test equipment and follow test procedures to confirm electronic circuit functionality, rectifying any faults found</p>	<p>Limited access to workshops.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p> <p>There are practical elements that cannot be remotely delivered.</p>	<p>Candidates could work in centre-agreed bubbles to check functionality and fix faults if needed.</p> <p>If possible, centres should provide separate test equipment per bubble. Alternatively, equipment could be rotated after sanitising/cleaning.</p> <p>Candidates could produce a written report to explain the test and rectification procedure as outlined in Task 3 of the model assignment. However, this needs to include evidence of the practical testing and fixing taking place.</p>
<p>Unit 5 Engineering systems control - operations and application</p>	LO2	<p>P3 Construct a designed automated control system to include identified components</p> <p>M2 Enhance constructed control system using different components to extend or improve functionality</p>	<p>Limited access to workshops/ CAD automation systems.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p> <p>There are practical elements that cannot be remotely delivered.</p>	<p>Candidates could work in centre-agreed bubble groups to construct an automated control system.</p> <p>Candidates could develop systems in small teams. Each team member could use different identified components changed in and out of the system and documented with video/annotated photos. An assessor witness statement can be used as evidence to support different candidate outcomes and component use.</p> <p>Candidates could use documented evidence to show alternative component use, system extension or functionality improvements in order to meet M2 criteria.</p>

Unit number(s) and title(s)	Learning objectives (LO)	Criteria	Issues identified in the unit(s)	Adaptations / solutions
	<p>LO3</p> <p>LO4</p>	<p>P4 Create block diagrams to represent system functions</p> <p>P5 Create instruction sets for identified automated control system functions</p> <p>P6 Write programme code for an identified control system</p> <p>M3 Implement the transfer or load of a programme to operate the identified programmable device</p> <p>D2 Interpret and document results of detailing corrections and refinements to a system</p> <p>P7 Develop a test plan for an identified control system</p> <p>P8 Test identified control system against test plan</p>	<p>Limited access to workshops/ CAD automation systems.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p>	<p>Candidates could complete P4-P6 remotely if the centre has facilities to allow them to access suitable software.</p> <p>Candidates could also complete M3 remotely. If the centre has suitable facilities, the programme could be emailed to the centre and uploaded to an automated system.</p> <p>If remote access to software is an issue, candidates could work in group bubbles to develop relevant individual solutions, block diagrams, programmes etc.</p> <p>Centres could use timed booking slots to upload and test programmes on an automated system. Extra time should be allowed between slots to clean equipment.</p> <p>Technicians or other staff could upload files. To support D2 criteria, candidates could video the automated system for documentation and review.</p> <p>For P8, technicians or other staff could upload files with instructions for tests produced by candidates. Candidates could video the automated system for documentation and review.</p>

Unit number(s) and title(s)	Learning objectives (LO)	Criteria	Issues identified in the unit(s)	Adaptations / solutions
<p>Unit 6 Develop and present engineering 2D and 3D design solutions</p>	<p>LO3-5</p>	<p>P3 Save, store, retrieve and print CAD drawings and 3D solid models</p> <p>P4 Use 3D Computer Aided Design to produce and modify a 2D engineered drawing(s)</p> <p>P5 Use CAD to produce 3D solid model(s) for an engineered product using main features, applied features and pattern features</p> <p>P6 Produce a 2D CAD engineering drawing that includes appropriate annotations and dimensions for an engineering component from a 3D solid model</p> <p>M2 Enhance 3D solid model(s) using a range of features</p>	<p>Limited access to workshops/ CAD automation systems.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p>	<p>Centres could use various platforms to teach elements of the unit to candidates, either remotely or via video.</p> <p>Candidates could access the unit remotely to develop 2D and 3D drawings, if the centre has facilities to allow them to access suitable software.</p> <p>Alternatively, candidates could use free software (such as SketchUp) to develop 2D and 3D drawings, including 3D solid models, to meet the drawing criteria, P3-P6 and M2.</p> <p>As part of the P3 criteria, candidates could create relevant file storage and the centre could print the files.</p> <p>As outlined in the model assignment tasks, all drawings must be accompanied with a written report that explains the software processes and features used. If they work remotely, candidates should be prepared to answer questions about the report so that assessors can be sure it is authentic. Any additional questions and answers should be included in the portfolio.</p>

Unit number(s) and title(s)	Learning objectives (LO)	Criteria	Issues identified in the unit(s)	Adaptations / solutions
<p>Unit 8 Optimise and maintain performance in engineering systems</p>	<p>LO1 LO2</p> <p>LO3 LO4</p>	<p>P1 Explain the reasons for maintenance and repair and the implications of not maintaining an engineering system or product</p> <p>P2 Prepare a sequence of maintenance tasks as part of a scheduled maintenance</p> <p>M1 Use data to produce a scheduled maintenance plan to maintain or improve system reliability.</p> <p>D1 Use calculations to determine reliability of systems or components to inform a maintenance strategy.</p> <p>P3 Work safely to perform maintenance procedures and system checks using manufacturer's instructions. Complete servicing and maintenance records.</p> <p>M2 Perform inspection and replacement of serviceable items using manuals, making adjustments where necessary.</p> <p>D2 Use diagnostic equipment to obtain data to confirm expected values. Provide advice on serviceable items requiring attention and any changes in maintenance frequency.</p> <p>P4 Perform system tests to identify cause of system failure and perform repairs.</p>	<p>Constraints of group working.</p> <p>These issues can reduce the time available.</p> <p>Limited access to workshops/machines.</p> <p>Constraints of group working.</p> <p>These issues can reduce the time available.</p>	<p>Centres could teach online via video, using demonstration videos and online sessions if possible to cover required LO understanding. To address M1 and D1 criteria, centres could provide a range of data related to maintenance so that candidates can develop schedules and calculations.</p> <p>Tasks 1 and 2 of the model assignment cover LO1/LO2. Candidates could produce the required reports and plans remotely. However, they should deliver the report and plan as a presentation with detailed speaker notes so that assessors can be sure that it is authentic.</p> <p>To support teaching and reduce the impact of social distancing in the workshop, centres could use workshop videos to demonstrate maintenance procedures.</p> <p>To manage workshop use, centres could use small work group bubbles. Each bubble could focus on different machines that need maintenance or service.</p> <p>Centres could use specific maintenance equipment per machine for separate bubble groups. Alternatively, they could use specific workshop time slots per group to allow equipment to be cleaned between groups.</p> <p>For P4, centres could use PDF maintenance manuals to allow individuals to identify suitable tests and repairs needed. This would reduce contact and avoid sharing resources.</p> <p>As long as it is within with centre policy, centres could allow candidates to use camera phones to document their progress, safe working, and so on for an e-portfolio.</p>

Support

OCR's team of expert Subject Advisors has created videos, webinars, and other resources to guide you through these changes and help you prepare your students for their exams in summer 2021.

These resources can be found on [the qualification page on our website](#).

Contact us

If you would like to contact us, you can do so at:

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