

It's easy to join us

Moving to the Cambridge National in Engineering Manufacture (J823) from BTEC Tech Award in Engineering (2017)

Are you currently teaching BTEC Tech Award in Engineering (2017)?

This short guide will take a look at our Cambridge National in Engineering Manufacture, show you how it compares to the BTEC and how you can easily move to teaching our specification.

Developed with the support of teachers, employers, and subject experts our Cambridge National in Engineering Manufacture has lots of key benefits for teachers and students.

Your students will build:

- real and **relevant** skills for the future
- valuable practical skills in engineering manufacture that are **highly sought after** in the workplace
- a **deep understanding** of the processes, materials, tools and equipment used within the engineering, manufacturing, process and control sector.

Our specification offers:

- a highly **relevant** curriculum developed with teachers and relating to modern Engineering Manufacture
- **clear and accessible** course information
- delivery that can be **tailored** to suit your needs
- a simple and intuitive assessment model, with **customisable assessments** to suit your resource base
- a **range of resources and CPD events** to help you understand the requirements of the curriculum
- support from a team of **expert OCR Subject Advisors** who you can call on to provide guidance
- **straightforward progression** to Level 3 Vocational Engineering, Design and Technology at A Level, or a range of related Apprenticeships in the sector.

About our Cambridge Nationals suite

We believe in developing specifications that help you bring the subject to life and inspire your students to achieve more.

We've created teacher-friendly specifications based on extensive research and engagement with the teaching community. They're designed to be straightforward and accessible so that you can tailor the delivery of the course to suit your needs.

You may be interested in this qualification if you want an engaging qualification where your students will use their learning in practical, real-life situations.

We offer a range of support services to help you at every stage, from preparation to delivery:

- **textbooks and teaching and learning resources from leading publishers.** For details of all the published resources that we endorse, check the [Cambridge Nationals page](#) on our website
- **free OCR resources** to help you plan your teaching and get your students **ready for assessment**
- an extensive **range of free professional development courses** covering everything from getting started to hands-on assessment practice. There are also regular Q&A opportunities with moderators and examiners. To find out more, visit our [professional development page](#)
- [Active Results](#): our **free results analysis service** to help you review the performance of individual students or whole school
- [ExamBuilder](#): our **free question-building platform** that helps you to build your own tests using past OCR exam questions
- **expert Subject Advisors** who are part of their subject communities and here to support you with advice, updates on resources, and information about training opportunities.

**Building
a future
for *all*
your
students**

At a glance specification comparison

	Cambridge National in Engineering Manufacture (Included on KS4 performance tables in England)	BTEC Tech Award in Engineering (2017)
Structure	There are three units of assessment. Students must complete all three units of assessment to achieve the qualification.	There are three units of assessment. Students must complete all three units of assessment to achieve the qualification.
Grading	All results are awarded on the following scale: Level 2 – Distinction* (*2), Distinction (D2), Merit (M2), Pass (P2) Level 1 – Distinction (D1), Merit (M1), Pass (P1) and Unclassified	All results are awarded on the following scale: Level 2 – Distinction* (*2), Distinction (D2), Merit (M2), Pass (P2) Level 1 – Distinction (D1), Merit (M1), Pass (P1) and Unclassified.
Assessment	<p>R014: Principles of engineering manufacture Exam 1 hour 15 minutes</p> <p>R015: Manufacturing a one-off product Internally marked and moderated by OCR OCR-set assignment Approximately 10-12 hours</p> <p>R016: Manufacturing in quantity Internally marked and moderated by OCR OCR-set assignment Approximately 10-12 hours</p> <p>OCR-set assignments provided for all NEA units by OCR June 1 each year. Teacher guidance highlights typical length to complete and other useful information.</p> <p>Terminal assessment: students can take exam as 'practice attempt' before all NEA units are completed but can only take the exam for certification once all NEA units have been completed and entered.</p> <p>Can resit the externally assessed unit. Traditional paper-based exams in January and June.</p> <p>NEA Assessments: students have one resubmission opportunity for NEA units, but any resubmission must be in a series in which the OCR-set assignment is still live. For example, if students have completed the OCR-set assignment in Year 10, they would not be able to resubmit in Year 11 as the OCR-set assignment will be changed annually.</p> <p>This is covered in section 6.4.4 of the specification (page 48).</p>	<p>Component 1 Exploring Engineering Sectors and Design Applications Internally marked and verified, external standards verification by Pearson. Authorised assignment brief set by Pearson, duration not specified and set by IV/SV process.</p> <p>Component 2: Investigating an Engineering Project Internally marked and verified, external standards verification by Pearson. Authorised assignment brief set by Pearson, duration not specified and set by IV/SV process.</p> <p>Component 3 Responding to an Engineering Brief Set task/external assessment taken under supervised conditions. Set and marked by Pearson.</p> <p>Made up of two parts:</p> <ul style="list-style-type: none"> • Two hours for Part 1: Practical experiment • One and a half hours for Part 2: External Exam <p>Completed during a one-week period timetabled by Pearson. Available in February and May/June. Only one resit available for external assessment New assessment task required. One resubmission of internal assessments possible as part of the IV/SV process Level 1 Pass required in all components to receive an overall grade from P1-D2.</p>

Cambridge National in Engineering Manufacture
(Included on KS4 performance tables in England)

BTEC Tech Award in Engineering (2017)

Administration	NEA Assessments: simple internal assessment processes and structured external moderation of all NEA units by OCR. No requirement for specialist, trained internal verification or centre standards verification. Familiar administration for exam officers.	Exam available in February and May/June. NEA Assessments: Internal Verification (for both setting and marking) by trained internal verifier with external standards verification. Standards verification process common across BTEC Entry to Level 3.
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Big fan of the engineering manufacturing qualification - the focus on end products can really stimulate our students.



Comparing assessment models

Cambridge National in Engineering Manufacture (Included on KS4 performance tables in England)	BTEC Tech Award in Engineering (2017)
<p>Unit R014 Principles of engineering manufacture In this unit you will learn about the different types of manufacturing processes, the materials that can be used to manufacture products using these processes, and the factors to be considered when determining the manufacturing requirements of an engineered product. OCR-set and marked 70 marks 48 GLH (40%) 1 hour 15 minutes written examination</p>	<p>Component 1 Exploring Engineering Sectors and Design Applications Authorised assignment brief set by Pearson, duration not specified and set by IV/SV process. Internally marked and verified, external standards verification by Pearson. Grading – U, P1, M1, P2, M2, D2 (converted to points score from 0 to 36). 36 GLH (30%).</p>
<p>Unit R015 Manufacturing a one-off product In this unit you will learn to identify the information required to make a product, plan the production of a product and carry out risk assessments for the processes, tools and equipment needed to produce a product in small quantities. NEA centre-assessed, OCR moderated 60 marks 36 GLH (30%)</p>	<p>Component 2 Investigating an Engineering Project Internally marked and verified, external standards verification by Pearson. Authorised assignment brief set by BTEC, duration not specified and set by IV/SV process. Grading – U, P1, M1, P2, M2, D2 (converted to points score from 0 to 36) 36 GLH (30%)</p>
<p>Unit R016 Manufacturing in quantity In this unit you will learn how to manufacture and use simple jigs and templates to support manufacturing in volume. By using CAD software, you will learn about the information needed to facilitate manufacture, and apply this in order to program Computer Numerical Control (CNC) equipment. NEA centre-assessed, OCR moderated 60 marks 36 GLH (30%)</p>	<p>Component 3 Responding to an Engineering Brief Set and marked externally – taken under supervised conditions. Made up of two parts:</p> <ul style="list-style-type: none"> • Two hours for Part 1: Practical experiment • One and a half for Part 2: External exam <p>Grading – U, P1, M1, D1, P2, M2, D2 (converted to points score from 0 to 48) 48 GLH (40%)</p>

Next steps

If you are an OCR-approved centre, all you need to do is download the specification and start teaching. Your exams officer can complete an intention to teach form which enables us to provide appropriate support. When you're ready to enter your students, you just need to speak to your exams officer.

Unit R014 is examined.

Units R015 and R016 are centre-assessed and OCR moderated.

This specification has two series of assessment availability, each January and June, and does contain a terminal rule for the externally assessed unit. For full details please see section 7.1 and 7.2 of the specification.

1. Get to know the specification, sample assessment materials and teaching resources on the Cambridge National in [Engineering Manufacture](#) web page.
2. Sign up to receive subject [updates by email](#).
3. Sign up to attend a [training event](#) or take part in a webinar on specific topics running throughout the year and our Q&A webinar sessions every half term.



Popular subject option with our students and engineering has a positive perception with parents which also helps.



And finally...

Detailed comparison of units

Cambridge National in Engineering Manufacture (Included on KS4 performance tables in England)			BTEC Tech Award in Engineering (2017)		
Unit R014 Principles of engineering manufacture OCR-set and marked 70 marks 48 GLH 1 hour 15 minutes written examination			Components		
			Component 1	Component 2	Component 3
Topic Area 1: Manufacturing processes	1.1	Types of manufacturing process		x	x
	1.2	Details of different manufacturing processes	x	x	x
Topic Area 2: Engineering materials	2.1	Mechanical properties of materials		x	
	2.2	Other properties influencing manufacturing		x	
	2.3	Types of engineering materials and how they are processed		x	x
Topic Area 3: Manufacturing requirements	3.1	Interpreting orthographic third angle projection drawings	x		
	3.2	Influence of the scale of manufacture on the production method	x	x	x
	3.3	Quality	x	x	x
Topic Area 4: Developments in engineering manufacture	4.1	Inventory management			
	4.2	Lean manufacturing			
	4.3	Globalisation		x	

**Cambridge National in Engineering
Manufacture**
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Unit R015 Manufacturing a one-off product

NEA centre-assessed, OCR moderated
60 marks
36 GLH

Components

Component 1

Component 2

Component 3

Topic Area 1: Planning the production of a one-off product	1.1	Interpret an engineering drawing to identify information to facilitate manufacture	x		
	1.2	Prepare a production plan to manufacture a one-off product		x	x
	1.3	Carry out a risk assessment		x	x
Topic Area 2: Measuring and marking out	2.1	Select and safely use equipment for marking out		x	
	2.2	Select and use measuring instruments		x	
Topic Area 3: Safely use processes, tools and equipment to make a product	3.1	Manually controlled machining operations		x	
	3.2	Tools and equipment		x	
	3.3	Joining techniques		x	

**Cambridge National in Engineering
Manufacture**
(Included on KS4 performance tables in England)

**BTEC Tech Award in Engineering
(2017)**

Unit R016 Manufacturing in quantity

NEA centre-assessed, OCR moderated
60 marks
36 GLH

Components

Component 1

Component 2

Component 3

Topic Area 1: Preparing for manufacture	1.1	Preparing for manufacture			x
	1.2	Sequence of operations		x	x
	1.3	Operating parameters			
	1.4	Standard operating procedures (SOPs)			
Topic Area 2: Develop programmes to operate CNC equipment	2.1	Use Computer Aided Design (CAD) software	x		
	2.2	Programme CNC machine operation			
Topic Area 3: Safely use processes and equipment to make products in quantity	3.1	Setting up of CNC equipment			
	3.2	Operating CNC equipment			
	3.3	Apply quality control methods for volume manufacture			

Need to get in touch?

If you ever have any questions about OCR qualifications or services (including administration, logistics and teaching) please feel free to get in touch with our customer support centre.

Call us on
01223 553998

Alternatively, you can email us on
support@ocr.org.uk

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