

Model Assignment

Issued September 2008

OCR Level 2 Principal Learning in Engineering

Unit F553: Manufacturing engineering

Please note:

This OCR model assignment may be used to provide evidence for the unit above. Alternatively, centres may 'tailor' the assignment within permitted parameters (see 'Notes for Tutors'). It is the centre's responsibility to ensure that any adaptations made to this assignment allow learners to meet all the assessment objectives and provide sufficient opportunity for learners to demonstrate achievement across the full range of marks.

The scheme codes for these qualifications are:

OCR Level 2 Principal Learning in Engineering 500/2399/8

The QCA Accreditation Number for this unit is:

Unit F553: Manufacturing engineering J/501/1889

This OCR model assignment remains live for the life of these qualifications.

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Model Assignment: Learner Information

OCR Level 2 Principal Learning in Engineering

Unit F553: Manufacturing engineering

Model Assignment

Description of model assignment.

In this unit you will work as part of a team to consider how multiples of an engineered component or product could be manufactured by a team.

Then, as an individual, you will detail appropriate quality control checks and explain the procedures of setting up a complex CNC machining operation to include the associated risks for the manufacture of multiple, identical components.

As an individual you will then manufacture **five** identical components of the product using a CNC machine.

This is a practical unit during which you will be guided and supported during the practical activities.

You will use your existing knowledge of taking readings, recording findings and analysing data.

Read through all of the following tasks carefully, so that you know what you will need to do to complete this assignment.

Tasks

Task 1: Planning for manufacture as part of a team

Assessment Criteria 1.1, 1.2

Your task as part of a team is to:

- contribute to the production of a manufacturing plan for the production of multiples of an engineered component or product using a CNC machine

You will need as part of a team to:

- suggest additional and/or alternative methods of manufacture based on your own knowledge and experience and fully justify the correct procedures to be adopted
- co-operate with others in reaching agreement in order to achieve the desired outcome.

Task 2: Quality checks

Assessment Criterion 2.1

Your task is to individually:

- design, describe, select and then use at least **six** different quality checks for the manufacture of the component or product using a CNC machine.

You will need to individually:

- include details of tolerances
- take and record readings during and after manufacture
- analyse the performance of the machining operation from the data obtained

Task 3: Programming, setting up and using CNC machines

Assessment Criteria 3.1, 3.2, 3.3, 3.4, 3.5

Your task is to individually:

- program and set up a CNC machining operation for the manufacture of your product or component
- review the machining process on screen and act on the outcome(s)
- record details of the machining procedures for the product or component
- consider safety in the planning and execution of the machining procedures
- manufacture **five** identical components on the CNC machine in a safe and confident manner.

Model Assignment: Tutor Information

OCR Level 2 Principal Learning in Engineering

Unit F553: Manufacturing engineering

Guidance for Centres

1 General

1.1 OCR model assignments are issued free to participating centres and are also available to download from our website: www.ocr.org.uk.

1.2 Centres may choose to:

- use OCR model assignments for formal summative assessment of learners
- tailor OCR model assignments for formal summative assessment of learners

It is intended that this Model Assignment can be used by centres without modification. However, in order provide appropriate contextualisation, improve access or increase local relevance, centres may 'tailor' the Model Assignments within set parameters. Details of the scope of adaptation are provided in the 'Notes for Tutors' section of this document.

1.3 This assignment has been designed to meet the full assessment requirements of the unit. Learners will need to take part in a planned learning programme that covers the underpinning knowledge and skills of the unit.

2 Before carrying out the assignment

2.1 Learners should be provided with a copy of the *Candidate Information* section of this assignment or the centre adapted Model Assignment.

2.2 Learners may carry out preparations prior to undertaking the tasks; there is no time limit for this.

3 When completing the assignment

3.1 All assessment evidence must be produced under **controlled conditions** so that the overall level of permit control secures validity and reliability, provides good manageability for all involved and allows teachers to authenticate the work confidently. Further guidance on **controlled conditions** is provided within the OCR Principal Learning Handbook.

3.2 In this unit it is recommended that learners spend 15glh on the acquisition of knowledge, skills and understanding. The remaining 15glh will take the form of controlled assessment where learners produce the appropriate evidence

3.3 Each candidate must produce individual and authentic evidence for each task within the assignment.

3.4 Centre staff may give support and guidance to learners. This support and guidance should focus on checking that learners understand what is expected of them. It is not

acceptable for presenters to provide model answers or to work through answers in detail.

- 3.5 Learners may use information from any relevant source to help them with producing evidence for the tasks.

4 After completing the assignment

4.1 Learners' evidence is assessed by the centre's assessor against the qualification specification contained in the Principal Learning Handbook. When marking learners work, centres **must** use the descriptors provided within the unit. For further information about assessment please refer to the section on Assessment and Moderation in the Principal Learning Handbook.

4.2 Assessors' decisions should be quality assured across the centre through internal moderation. For further information about internal moderation please refer to the section on Assessment and Moderation in the Principal Learning Handbook.

5 Presentation of work

5.1 Learners will present their work using the most suitable format.

6 Acceptable evidence

6.1 For guidance on generation and collection of evidence please refer to the section on Assessment and Moderation in the Principal Learning Handbook.

7 Plagiarism and unauthorised collaboration

7.1 Centres should have adequate procedures in place to ensure that plagiarism and unauthorised collaboration are identified and responded to.

7.2 When supervising tasks, teachers are expected to:

- offer learners advice about how best to approach such tasks
- inform learners of the ramifications of unfair practice
- exercise continuing supervision of work in order to monitor progress and to prevent plagiarism
- ensure all copied materials is suitably acknowledged
- ensure copied material is not given credit in the assessment process

7.3 As with all controlled assessments, the teacher/tutor presenter must be satisfied that the work submitted for assessment is the learner's own work.

Notes for Tutors

Introduction to the Tasks

The tasks have been designed to enable learners to demonstrate their knowledge and understanding of programming and setting up a complex CNC machining operation including the associated health and safety risks and then operate the CNC machine to manufacture **five** identical components or products.

Initially learners will work as part of a team to consider how multiples of an engineered component or product could be manufactured by a team.

Learners will then go on, with appropriate guidance and support, to individually manufacture **five** identical products or components using a CNC machine.

Learners will need to review the machining process on screen and act on the outcome. They will consider safety both in their planning and during the manufacture.

Learner's individual evidence must include:

- the design of an appropriate set of quality checks and the means by which they would be undertaken
- details of the programming and setting up of a CNC machining operation
- evidence of the manufacture of a batch of **five** products using a CNC machine
- details of what tolerances would be acceptable for the engineered component or product being produced
- evidence of the application of a minimum of **six** quality control checks
- analysis of and use of the statistical data from all **six** of the quality checks
- suggested modifications and improvements to the machining operation in the light of the learners findings
- consideration of health and safety in relation to the practical activity and the industrial equivalent

Resources for managing Health and Safety can be found in the Quality Improvement Agency (QIA) presenter resources; National Teaching and Learning Programme: 'Engineering'.

These guidance notes should be used in conjunction with the unit specification and Principal Learning Handbook.

Scope of permitted Model Assignment modification

The model assignment is self-contained in its present form. The set of tasks form a coherent whole addressing all the assessment criteria.

It is permissible to contextualise or carry out modification of this model assignment in order to provide appropriate contextualisation, improve access or increase local relevance. However, centres must take great care when 'tailoring' tasks to ensure that modifications do not result in the over direction of learners, devalue the applied nature of the work or deny the learner the opportunity to generate evidence for all the assessment criteria at all levels of outcome.

No changes to the assessment criteria are allowed.

When completing this model assignment it may be possible to generate evidence for completing a task in a variety of formats. This list is not exhaustive and will depend on the approach taken to complete the task or model assignment. In some cases the task or model assignment will require a specific format for the outcome and this will be clearly marked in the table.

Depending on the approach taken to the model assignments it may also be possible to demonstrate additional PLTS coverage and some additional opportunities have been listed below.

Task activity	Nature of evidence generated	Potential Assessment Criteria coverage
<p>Task 1</p> <p>Planning for manufacture as part of a team</p>	<p>Specific detail will vary depending on the product selected from those prescribed and detailed by OCR.</p> <p>Details and justifies the chosen manufacturing processes and produces a production plan for the prescribed product.</p> <p>Decide how multiples of the product could be manufactured by a team.</p>	<p>Assessment Criteria</p> <ul style="list-style-type: none"> • 1.1, 1.2 <p>PLTS</p> <ul style="list-style-type: none"> • IE1 • TW1 • TW2 • TW5
<p>Task 2</p> <p>Quality checks</p>	<p>Detailed descriptions of six quality checks for the chosen component.</p> <p>Production of a record of results of quality checks during manufacture.</p> <p>Uses the gathered statistical data to analyse the performance of the machining operation.</p>	<p>Assessment Criteria</p> <ul style="list-style-type: none"> • 2.1 <p>PLTS</p> <ul style="list-style-type: none"> • CT1 • IE4

<p>Task 3</p> <p>Programming, setting up and using CNC machines</p>	<p>Evidence of the set up of the CNC machining operation for manufacture of the product or component</p> <p>Evidence of the review the machining process on screen and of acting upon the outcome.</p> <p>Detailed record of the machining procedures for the product or component</p> <p>Consideration of safety in the planning and execution of the machining procedures</p> <p>The manufacture of five identical components on the CNC machine in a safe and confident manner.</p>	<p>Assessment Criteria</p> <ul style="list-style-type: none"> • 3.1, 3.2, 3.3, 3.4, 3.5 <p>PLTS</p> <ul style="list-style-type: none"> • SM4
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