

Preparation work for pathway Engineering

Cambridge National Engineering

Manufacturing

This course is made up of 4 units. 3 of these units are assignments to be completed in school and marked by the teacher. The fourth unit is an external exam.

UNIT R110 Preparing and planning for manufacture

To prepare for this unit, you will need to understand how a centre lathe and milling machine works.

Centre Lathe

Write a report to include:

Information about the centre lathe and what it is used for. Your report should include an image of the lathe which explains what the different parts of the machine are.

How to set up and use the lathe for the following operations:

- Facing off
- Cylindrical turning
- Chamfering
- Drilling and tapping
- Parting off
- How to set speeds and feeds.

Vertical milling machine

Write a report to include:

Information about the vertical milling machine and what it is used for. Your report should include an image of the vertical milling machine which explains what the different parts of the machine are.

How to set up and use the vertical milling for the following operations:

- Setting an end mill cutter in a collet
- Setting a piece of work in the vice using a DTI
- Milling a slot in a piece of aluminium

Both reports must include information about health and safety to include:

- The correct PPE equipment
- Floor markings
- Machine safety

UNIT 111 Computer Aided Manufacture

For this assignment, you will need to understand how the CNC lathe and milling machine works.

Write a report which explains what a CNC lathe is.

Explain how the machine is set up and used for the following operations:

- Facing off
- Cylindrical turning
- Chamfering
- Drilling and tapping
- Parting off
- How to set speeds and feeds.

Provide a labelled image of a CNC lathe

Explain the benefits of a CNC lathe in comparison to a manual centre lathe

Your report must include information about health and safety to include:

- The correct PPE equipment
- Floor markings
- Machine safety

UNIT R112 Quality control of engineered products

For this assignment you will need to understand quality control and monitoring techniques.

Write a report about the following pieces of quality monitoring equipment:

Vernier calliper

Micrometer

Steel rule

Vernier height gauge

GO/NO GO gauges <https://www.youtube.com/watch?v=nfoUdm9WdE4>

For each piece of equipment, provide an image with explanation for what they are used for.

Helpful links:

Centre lathe:

<https://www.youtube.com/watch?v=yVqhjzlaNFg>

<https://www.youtube.com/watch?v=k-ddj8vWYZQ>

https://www.youtube.com/watch?v=Vm5Chb_2JxA

Vertical milling machine

<https://www.youtube.com/watch?v=UQDFgeNNvHk>

<https://www.youtube.com/watch?v=lqMnWy5OM2A>

<https://www.youtube.com/watch?v=WwvNU0GS6LE>

DTI (Dial Test Indicator)

<https://www.youtube.com/watch?v=UikBNF-3uOw>

CNC lathe

<https://www.youtube.com/watch?v=Z6f3BPK7CTc>

<http://www.technologystudent.com/cam/cnc1.htm>

Vernier caliper

<https://www.youtube.com/watch?v=vkPlzmalvN4>

<http://www.technologystudent.com/equip1/vernier3.htm>

Micrometer

<https://www.youtube.com/watch?v=StBc56ZifMs>

<http://www.technologystudent.com/equip1/microm1.htm>

Vernier height gauge

<https://www.youtube.com/watch?v=bAP19pDeqGU>

<https://www.youtube.com/watch?v=-oSKiVioFws>