****

**Engineering Summer Assignment document for:**

**C&G Diploma in Engineering**

**Level 3 Manufacturing Engineering**

**September 2024 – July 2025**



**Name of learner**:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Contact Information**

|  |  |
| --- | --- |
| **Course Leader/Contact**  | **Doug Stanyer** |
| **Email** | **dougs@shrewsbury.ac.uk** |

**Introduction to this summer assignment:**

This provides you with:

* An introduction to the course subject material.
* Details of basic resources to use.
* Opportunity to demonstrate how you use research.
* How you will be assessed.
* How you will get feedback

Your chosen course is structured in such a way, as to build upon your knowledge and skills from the very first week of the course, through to the end. You course will be delivered using various methods, from theory based, through to practical workshops.

**What is the purpose of this assignment?**

To demonstrate what you have learned in the welcome sessions and how you can expand this, using research from links provided and further research from websites and further reading which is available from a library or other free resources.

This will link to the two units covered in the first term of the academic year starting in September 2024.

These units are listed below:

**Unit 301 Working in Engineering Sept 24 – December 24**

This is a theory-based unit delivered in a classroom environment covering all aspects of working within an engineering environment. Subjects include:

**Learning** **outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand compliance with statutory health and safety

2. Understand compliance with statutory environmental regulations

3. Know how to implement accident and emergency procedures

4. Understand safe working practices and procedures

Assessment will be covered by an online multiple-choice exam in November 2022.

**Unit** **324** **Machining materials by milling Sept 24 – December 24**

Practical based unit with the following outcomes:

Learning outcomes

There are four outcomes to this unit. The learner will:

1. Be able to prepare for milling operation

2. Be able to machine components using a universal dividing head

3. Be able to machine components by reaming and boring

4. Be able to reinstate the work area

Assessment as unit will be marked practical work combined with a short answer exam paper in November 2024.

**Free resources list for both online and public library**

Health and safety:

HSE: Information about health and safety at work, covering COSHH, PPE, PUWER, accidents in the workplace and regulations.

<https://www.hse.gov.uk/>

Resource link to unit 301 see below:

[301](https://shrewsburycollege-my.sharepoint.com/%3Af%3A/g/personal/dougs_shrewsbury_ac_uk/Eq-bcVwdcC9Osuhh4vimF8QBJDVE4Bj3fFjga13t2SSTvQ?e=h1CcDY)

Level 3 Milling resources

Presentation link below:

General [library](https://www.twi-global.com/technical-knowledge/job-knowledge/mig-welding-004) resources on Engineering

[Milling2800Pt3 (1).ppt](https://shrewsburycollege-my.sharepoint.com/%3Ap%3A/g/personal/dougs_shrewsbury_ac_uk/EbcgwvS-gL9LkUePN_-uieABTzIQ6JWExMJbXOBR1OwvYQ?e=xnHzAv)

**How will you be assessed?**

You will be asked questions in the assignment paper and see the appropriate marks for the complexity of answer required.

Example 1:

Explain the factors affecting choice of **cutting speed**

Example 2:

Explain the **relationship between rotation of cutter and feed direction**

**How will you get feedback?**

You will hand the assignment in to your subject tutor at the start of the academic term and they will mark the document and give written feedback alongside the score of what you have achieved, ready for the following week.

This will help you to prepare for upcoming theory and practical sessions, and give you focus towards the progress tests that are 4 weeks into the new term.

Remember to submit your work in a presentable manner, if it cannot be read by the person marking, it will not achieve marks for that question.

**Assignment Question Paper Level 3 Mechanical Engineering**

1) Refer to the machining of thin plate using a slitting saw.

 a) Show by means of a labelled sketch the direction of

 i) rotation

 ii) feed. (4 marks) b) State why this method is preferred. (2 marks)

2) State **two** advantages and **one** disadvantage of using a two fluted slot drill compared to an end mill. (6 marks)

3) A 28 diameter, 8 tooth end mill operates at a cutting speed of 44m/min with a cut per tooth of 0.08mm. Calculate:

 a) the spindle speed in revs per minute (3 marks)

 b) the feed rate in mm/min. (3 marks)

4) When using a dividing head

 a) State **three** methods of holding work (3 marks)

 b) A 40:1 ratio dividing head is to be used to index a component

 through 43 degrees.

 The hole plates available have 46, 47, 51, 53, 54, 57, 62, 66 and 68 holes. Calculate, using simple indexing, the number of turns of the

 crank rotations and hole divisions required. (3 marks)

5)  State **four** problems that may occur during machining without the use of

 appropriate cutting lubricants. (6 marks)

 6)  Planning the sequence of operations is one factor to be considered for the

 effective production of components. State **three** others. (6 marks)

7) a) State what is meant by **each** of the following

 i) fixed guards

 ii) adjustable guards. (4 marks)

 b) State **one** example where **each** type of guard given in a) would be used. (2 marks)

8)  State **four** requirements to comply with Health and Safety legislation to

 protect yourself and others in the vicinity of machining operations.

 (6 marks)

9) State **six** procedures to be followed after machining when returning the

 machine to its original clean state. (6 marks)

10) a) State **three** safety precautions to be observed with regards to the

 maintenance of overalls.

 (3 marks)

 b) State **one** problem that may occur when restoring the work area with

 regards to **each** of the following

 i) cutters ii) manual lifting iii) swarf. (3 marks