Pearson BTEC

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Pearson BTEC
Level 2 Technical Occupational Entry for

Lean Manufacturing Operatives (Diploma)

Specification

First teaching from September 2025

First certification from 2026

Issue 2

Qualification Number: 610/4252/3

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BTEC Technical Occupational Entry qualification

First registration September 2025

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About Pearson

We are the world's leading learning company operating in countries all around the world. We provide content, assessment and digital services to students, educational institutions, employers, governments and other partners globally. We are committed to helping equip students with the skills they need to enhance their employability prospects and to succeed in the changing world of work. We believe that wherever learning flourishes so do people.

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All information in this specification is correct at time of publication.

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Welcome

With a track record built over 30 years of student success, BTEC qualifications are widely recognised and respected. They provide progression to the workplace either directly or via study at higher levels. Recent data has shown that 1 in 5 adults of working age in the UK has a BTEC qualification.

Why choose BTEC Technical Qualifications?

BTEC Technical Qualifications enable students to develop a purposeful and coherent combination of knowledge, skills and behaviours to confidently enter or progress into employment at entry level in occupations that are recognised and demanded by employers.

The qualifications, which are based on the occupational standards published by the Institute for Apprenticeships and Technical Education (IFATE), embody a fundamentally learner-centred approach to the curriculum, with a flexible, unit-based structure and an approach to learning and assessment that:

- provides students with meaningful and occupationally relevant learning experiences
- engages and motivates students to achieve as assessments can be focused on individual student needs and can be achieved as they progress through the qualifications
- promotes self-directed learning through the clarity and transparency of the standards to be achieved
- makes the qualifications accessible to a wider range of students, including part time and adult students.

In developing these qualifications, we have collaborated with employers to ensure that the qualifications meet the current and emerging needs of industry. We have also worked with colleges and training providers to ensure that the qualifications meet their needs and those of their students.

We are providing a range of support to ensure that students and their tutors have the best possible experience during their course. Further information is provided on the qualification pages of our website.

A word to students

These qualifications will require commitment and hard work. You will have to complete the learning for the required range of units, be organised and complete your assessments, which may include practical work-based activities, projects and vocational assignments. But you can feel proud to achieve a BTEC Level 2 Technical Qualification as you can be confident in your readiness to advance your career in your chosen occupation.

Good luck, and we hope you enjoy your course.

Summary of changes to Pearson BTEC Level 2 Technical Occupational Entry for Lean Manufacturing Operatives (Diploma) specification

Summary of changes made between the previous issue and this current issue	Page Number
Updated wording to provide clarity concerning mandatory evidence for assessment, and authorised assignment briefs.	8-9
The Assessment and Mandatory evidence requirements sections for each unit have been simplified to aid clarification concerning assessment requirements.	23-24; 33-34; 41; 51-52; 61; 72-73; 83-84
Updated Transferable Skills Framework (Appendix 1).	90-94

Earlier issue shows previous changes.

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Contents

1 Introducing the qualification

What are Level 2 Technical Occupational Entry Qualifications?

Level 2 Technical Occupational Entry Qualifications are qualifications that are at Level 2 on the Regulated Qualifications Framework (RQF) and are designed to deliver the knowledge, skills and behaviours needed to enter the workplace. They can be delivered through a combination of classroom and work-based learning and assessment.

These qualifications are based on occupational standards designed by employers and published by the Institute for Apprenticeships and Technical Education (IfATE), who also approve the qualifications. IfATE has specified different categories under which Level 2 Technical Qualifications can be approved based on their scope and purpose. Detailed information about these categories can be found on IfATE's website.

Qualification purpose

The Pearson BTEC Level 2 Technical Occupational Entry in Lean Manufacturing Operatives (Diploma) enables students to develop a purposeful combination of knowledge, skills and behaviours to enter employment as a Lean Manufacturing Operative at entry level and provides a strong foundation for them to achieve full occupational competence with further training and development in the workplace.

The qualification is designed to meet the needs of students (16+) and provides progression to employment in an occupation that is recognised and demanded by employers.

The qualification will:

- develop students' ability and confidence to apply the knowledge, skills and behaviours in carrying out the relevant occupational duties and functions to meet entry level competence
- develop transferable skills, and professional behaviours/attributes such as working relationships, personal behaviours and attitudes, and support the development of confidence and readiness for progression and employment that are essential to personal effectiveness in the stated occupation
- develop knowledge and understanding of best practices and core values such as health and safety, workplace organisational techniques, and problem solving that are important for meeting professional requirements in a lean manufacturing environment
- provide opportunities for students to achieve a nationally recognised occupational qualification to support them in taking the next step in their career

- provide employers with reliable evidence of students' attainment against the Lean Manufacturing Operative occupational standard and their readiness to enter employment in the related occupation at entry level.

The qualification can be taken on a part-time or full-time basis to meet the needs of older 16 + students.

Employer engagement and validation

In developing the Pearson BTEC Level 2 Technical Occupational Entry in Lean Manufacturing Operatives (Diploma), we have worked closely with a dedicated panel of 12 employers from a range of different types of organisations, who have:

- validated the demand for the qualification and confirmed that it is occupationally relevant and meets the current and emerging needs of industry
- confirmed that students will have an appropriate combination of knowledge, skills and behaviours relevant to the occupational standard that attests to their readiness to enter into employment in the related occupation at an entry level.

Progression opportunities

Students who achieve the Pearson BTEC Level 2 Technical Occupational Entry in Lean Manufacturing Operatives (Diploma) will most likely progress into specific employment at entry level in lean manufacturing fields of inspection/quality, logistics/material, production processing/finishing and production/assembly. However, students may also progress to the Apprenticeship for Lean Manufacturing Operative at Level 2.

2 Qualification summary and key information

Qualification title	Pearson BTEC Level 2 Technical Occupational Entry in Lean Manufacturing Operatives (Diploma)
Qualification Number (QN)	610/4252/3
Regulation start date	28/05/2024
Operational start date	01/09/2024
Approved age ranges	16–18 18+ 19+
Total qualification time (TQT)	404 hours
Guided learning hours (GLH)	360 hours
Assessment	Internal assessment demonstrating evidence of entry level competence. Required methods of assessment and evidence will be described in the unit. Please see *Section 5 Assessment requirements*.
Grading information	The qualification and units are graded Pass/Fail. All units must be passed.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before students register for this qualification.
Funding	This qualification is eligible for 16+ funding as a Technical Occupational Entry qualification. Information about funding can be found on the Find a learning aim database.

3 Qualification structure

Pearson BTEC Level 2 Technical Occupational Entry in Lean Manufacturing Operatives (Diploma)

The requirements outlined in the table below must be met for Pearson to award the qualification.

Minimum number of units that must be achieved	7

Unit number	Mandatory units	Level	Guided learning hours
1	Working Within a Manufacturing Environment	2	30
2	Workplace Organisational Techniques	2	30
3	Producing Products by Assembly Operations	2	60
4	Preparing, Controlling and Handing Over Manufacturing Operations	2	60
5	Transferring, Handling and Checking Materials for Manufacturing Operations	2	60
6	Producing and Finishing Products	2	60
7	Inspection, Analysis and Quality Production	2	60

4 Delivery

Occupational entry level competence

This qualification is designed to be delivered in post-16 learning contexts. Delivery should focus on student's ability to use knowledge, skills and appropriate behaviours in the workplace.

Work placement

Work placement is not essential for completion of this qualification. Nevertheless, students are encouraged to form links with the workplace. This can be through work experience with employers, or links between workplaces and their place of study.
In assessment, simulation of the work environment is permitted.

Transferable skills

Recent future skills reports have highlighted the growing importance of transferable skills for students to succeed in their careers and lives in this fast-changing world.

Following research and consultation with further education (FE) educators and higher education institutions, Pearson has developed a Transferable Skills Framework to facilitate and guide the development of transferable skills through this qualification.
The Framework has four broad skill areas, each with a cluster of skills as shown below:

1. **Managing Yourself**: (1) Taking Personal Responsibility; (2) Personal Strengths & Resilience; (3) Career Orientation Planning; (4) Personal Goal Setting
2. **Effective Learning**: (1) Managing Own Learning; (2) Continuous Learning; (3) Secondary Research Skills (4) Primary Research Skills
3. **Interpersonal Skills**: (1) Written Communications; (2) Verbal and Non-verbal Communications; (3) Teamwork; (4) Cultural and Social Intelligence
4. **Solving Problems**: (1) Critical Thinking (2) Problem Solving; (3) Creativity and Innovation.

Each transferable skill has a set of descriptors that outline what achievement of the skill looks like in practice. Each unit in the qualification will show whether a transferable skill has been:

1. fully embedded through the design of the teaching and learning content and assessment of the unit. Skills that are embedded are 'naturally occurring' in that they are inherent to the unit content and doesn't require extension activities to deliver

2. signposted as an opportunity for delivery and development and would require extension activities to deliver.

Units will show a summary of the transferable skills that have been embedded or signposted and *Appendix 1* shows the descriptors for each skill across all the skill clusters.

More information on the framework, its design and relevance for student progression is available in the *BTEC Transferable Skills Guide for Teachers*. Resources and guidance to support teachers in the delivery and development of these skills will be available in the Delivery Guide for this qualification and through our training offer.

Sustainability education

To help students develop sustainability skills, practices and mindset, we have designed content in this qualification, aligned to the UNESCO Sustainable Development Goals (17 SDGs) that is relevant and appropriate to the sector. The SDGs are the most common point of reference for content that addresses sustainability education and provides a useful and pragmatic way of presenting this content.

Sustainability knowledge and understanding may be included in the teaching and learning content but not directly assessed. Alternatively, it could be assessed – the approach chosen for each unit is based on the relevance of knowledge and understanding to the purpose and scope of the unit.

5 Assessment requirements

Language of assessment

Students must use English only during the assessment of this qualification.

A student taking the qualification may be assessed in British Sign Language where it is permitted for the purpose of reasonable adjustment.

Further information on the use of language in qualifications is available in our *Use of languages in qualifications policy*, available on our website, qualifications.pearson.com.

Internal assessment

Internally assessed units are subject to standards verification. This means that centres set and mark the final summative assessment for each unit, drawing on mandatory evidence requirements and support that Pearson provides.

To pass each internally assessed unit, students must:

- achieve all the specified learning outcomes
- satisfy all the assessment criteria by providing sufficient and valid evidence for each criterion
- meet any prescribed evidence requirements for a unit i.e., units may mandate practical demonstration of skills in a workplace or simulated environment
- prove that the evidence is the own.

Centres must ensure:

- assessment is carried out by tutors with relevant expertise in both the occupational area and assessment. For the occupational area, this can be evidenced by a relevant qualification or current (within three years) occupational experience that is at an equivalent level or higher than this qualification. Assessment expertise can be evidenced by qualification in teaching or assessing and/or internal quality assurance or current (within three years) experience of assessing or internal verification
- internal verification systems are in place to ensure the quality and authenticity of students' work, as well as the accuracy and consistency of assessment.

Students who do not successfully pass an assessment are allowed to resubmit evidence for the assessment.

Levels of control in internal assessment

Task setting

Centres are able to design tasks that address the assessment criteria within a unit. Restrictions on task setting such as mandatory forms of evidence requirement, or restrictions surrounding the context of assessment will be stated within the qualification unit and any accompanying authorised assignment brief(s). Although task setting is characterised as low control, Pearson applies quality assurance methodology to ensure that centre systems are in place to develop and assure high quality assessments for students. The authorised assignment brief serves as a model for the expected presentation of a unit assessment. Further guidance and references are provided in *Section 9: Quality Assurance of centres*.

Task taking

Centres must be able to authenticate the student response to the assessment. Supervision may not always be appropriate, if for example a student is gathering evidence for an assessment that is then prepared in a classroom environment. However, centres must be assured that students produce their own response to assessment criteria. This may require supervision of students in writing up outcomes to ensure they do not use text generative AI software.

Task marking

Centre assessors and tutors will mark the student assessment response, using Pearson BTEC assessment/grading criteria and the guidance we provide in the specification and surrounding process, and training we provide supporting our quality assurance process. Pearson will quality assure the processes that centres use to ensure the standard of marking outcome. We operate a risk-based quality assurance process ensuring that new centres, centres with large cohorts and centres with other risk factors get the support they need to ensure students achieve the outcome they have worked for.

Mandatory evidence for assessment

Units will include information on the mandated types, quality and standard of evidence that students must produce to achieve a unit.

Tutors must ensure that collated tasks/assignments enable students to generate the evidence needed against the assessment criterion standard.

Authorised Assignment Briefs (AABs)

Pearson has produced an Authorised Assignment Brief (AAB) for each unit to support centres in the assessment of this qualification. The AABs are published separately to the specification on the Pearson website both as a PDF and Word document and set out a recommended assessment approach. If students meet the requirements of the published AAB then they will meet the requirements set out in the assessment criteria.

It is strongly recommended that centres refer to the AAB for each unit.

Centres can use the AAB in three ways:

- As the assignment brief for students, without changing it.
- As a guide to the level of evidence that is required from students, while choosing to write their own assessment brief.
- As a basis for their own assessments, taking the AAB and amending in line with a particular context or local need.

6 Centre recognition and approval

Centres must have approval prior to delivering any of the units in this qualification.

Centres that have not previously offered BTEC qualifications need to apply for, and be granted, centre recognition as part of the process for approval to offer individual qualifications.

Existing centres will be given 'automatic approval' for a new qualification if they are already approved for a qualification that is being replaced by a new qualification and the conditions for automatic approval are met.

Guidance on seeking approval to deliver BTEC qualifications is given on our website.

Approvals agreement

All centres are required to enter into an approval agreement with Pearson, in which the head of centre or principal agrees to meet all the requirements of the qualification specification and to comply with the policies, procedures, codes of practice and regulations of Pearson and relevant regulatory bodies. If centres do not comply with the agreement, this could result in the suspension of certification or withdrawal of centre or qualification approval.

Centre resource requirements

As part of the approval process, centres must make sure that the resource requirements below are in place before offering the qualification:

- appropriate physical resources (for example IT, learning materials, teaching rooms) to support the delivery and assessment of the qualification
- access to resources including simulated environments and manufacturing workshops that support understanding of a lean manufacturing environment
- suitable staff for delivering and assessing the qualification (see *Section 5 Assessment requirements*)
- systems to ensure continuing professional development (CPD) for staff delivering and assessing the qualification
- health and safety policies that relate to the use of equipment by students
- internal verification systems and procedures (see *Section 5 Assessment requirements*)
- any unit-specific resources stated in individual units.

7 Access to qualifications

Access to qualifications for students with disabilities or specific needs

Equality and fairness are central to our work. Our *Equality, diversity and inclusion policy* requires all students to have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic (as defined by the Equality Act 2010) are not, when they are taking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic
- all students achieve the recognition they deserve from their qualification and that this achievement can be compared fairly to the achievement of their peers.

For students with disabilities and specific needs, the assessment of their potential to achieve the qualification must identify, where appropriate, the support that will be made available to them during delivery and assessment of the qualification.

Centres must deliver the qualification in accordance with current equality legislation. For full details of the Equality Act 2010, please visit www.legislation.gov.uk

Reasonable adjustments and special consideration

Centres are permitted to make adjustments to assessment to take account of the needs of individual students. Any reasonable adjustment must reflect the normal learning or working practice of a student in a centre or a student working in the occupational area.

Centres cannot apply their own special consideration – applications for special consideration must be made to Pearson and can be made on a case-by-case basis only.

Centres must follow the guidance in the Pearson document *Supplementary guidance for reasonable adjustments and special consideration in internal assessments*.

8 Recognising prior learning and achievement

Recognition of Prior Learning (RPL) considers whether a student can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and so do not need to develop through a course of learning. If RPL is used, a student must be assessed again against assessment criteria, and their evidence must meet any mandatory evidence requirements in units.

Pearson encourages centres to recognise students' previous achievements and experiences in and outside the workplace, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning.

RPL enables recognition of achievement from a range of activities using any valid assessment methodology. If the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be valid, authentic, reliable, current, and sufficient.

Further guidance is available in our policy document *Recognition of prior learning policy and process*, available on our website.

9 Quality assurance of centres

For the qualification in this specification, the Pearson quality assurance model will consist of the following processes.

Centres will receive at least one visit from our Standards Verifier, followed by ongoing support and development. This may result in more visits or remote support, as required to complete standards verification. The exact frequency and duration of Standards Verifier visits/remote sampling will reflect the level of risk associated with a programme, taking account of the:

- number of assessment sites
- number and throughput of students
- number and turnover of assessors
- number and turnover of internal verifiers
- amount of previous experience of delivery.

Following registration, centres will be given further quality assurance and sampling guidance.

For further details, please see the work-based learning quality assurance handbooks, available in the support section of our website:

- *Pearson Work-based Learning Centre Guide to Quality Assurance*
- *Pearson Work-based Learning Delivery Guidance & Quality Assurance Requirements.*
- Support is also available on our work-based learning quality assurance webpages Quality Assurance – Work-based Learning (WBL) | Pearson qualifications

10 Units

This section of the specification contains the units that form the assessment for the qualification.

It is compulsory for students to meet all learning outcomes and the assessment criteria to achieve a grade. The assessment criteria determine the standard required. Content is compulsory unless it is provided as an example and is therefore marked 'e.g.,'. All compulsory content must be delivered, but assessments may not cover all content.

Where legislation is included in delivery and assessment, centres must ensure that it is current and up to date.

Unit 1: Working Within a Manufacturing Environment

Level: 2

Unit type: Mandatory

Assessment type: Internal

Guided learning hours: 30

Unit in brief

Students study the importance of good working relationships in lean manufacturing working environments and approaches that are used to communicate effectively in a lean manufacturing environment, including the use of drawings and documentation.

Unit introduction

Forming good working relationships with others, being able to work in a team and a positive attitude to work contribute to efficient productivity in lean manufacturing environments. In order for an operative to carry out their role safely and effectively, it is important that they know the statutory rules and regulations relating to their job role and work area. Training and education help operatives to achieve their aspirations in developing their career, in turn this can motivate them to work more efficiently and effectively.

In this unit, you will investigate the factors that promote a positive working attitude, develop an understanding of the importance of effective working relationships and learn how you can contribute to effective team working. You will investigate how to communicate effectively using a range of methods and technical information common to lean manufacturing environments. This includes verbal, non-verbal and written methods, and specific terminology found in lean manufacturing environments. You will gain an understanding of the importance of using the correct terminology when communicating technical information and you will examine how technical information is presented and shared.

You will be able to explain the need for effective planning and preparation before starting manufacturing processes and operations begin.

Learning outcomes and assessment criteria

To pass this unit, students need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Understand how attitude has an influence on behaviour	1.1 Describe the characteristics of a positive working attitude 1.2 Describe the factors that help to create a positive working attitude within a manufacturing environment 1.3 State the importance of having a positive working attitude in a manufacturing environment 1.4 Outline the consequences of a negative attitude to work in a manufacturing environment
2. Understand the importance of creating and maintaining effective working relationships	2.1 Identify the characteristics of effective working relationships 2.2 Describe the factors that contribute to effective working relationships in manufacturing environments 2.3 State the importance of creating and maintaining effective working relationships
3. Understand the importance of effective team working	3.1 Describe the factors that contribute to effective team working in manufacturing environments 3.2 State the importance of effective team working in manufacturing environments 3.3 Describe how to implement effective team working in manufacturing environments
4 Understand how to communicate effectively within a manufacturing environment	4.1 State why effective communication is important in a manufacturing environment 4.2 Describe communication methods to be used in different situations in a manufacturing environment 4.3 Explain the factors to consider when communicating in a manufacturing environment 4.4 State the importance of using correct terminology to communicate technical information in the manufacturing workplace)

Learning outcomes	Assessment criteria
5. Understand how job roles can lead to career development	5.1 Describe career opportunities within own manufacturing environment and related sectors 5.2 Outline sources of information related to a chosen career pathway 5.3 Describe the necessary steps for personal career development
6. Understand the role of representative bodies in the manufacturing environment	6.1 Describe the main roles and responsibilities of representative bodies within manufacturing environments 6.2 Describe the benefits to employers and employees of representative body membership in manufacturing environments

Unit content

What needs to be learned
Learning outcome 1: Understand how attitude has an influence on behaviour
1A Influence of attitude on behaviour • Characteristics of a positive working attitude, e.g., taking responsibility, being a role model, sharing ideas. • Consequences of a negative attitude to work, e.g., being late to work, unwilling to try new things, lack of care, low morale, poor communication, deadlines not met. **1B Factors that contribute to a positive working attitude** • Responsibility, e.g., timekeeping, personal appearance, obtaining information. • Role models, e.g., experienced colleagues, team leaders, mentors. • Rewards, e.g., performance-related bonuses, employee of the month, share schemes. • Workload, e.g., sufficiently challenging, not underutilised or overstretched. • Accountability, e.g., sharing of targets, performance review, appraisal, personal development. • Environment, e.g., working safely, workspace organisation, climate control, lighting. **1C Importance of a positive working attitude** • Improved morale (effect on colleagues, collaboration, effects of keeping a positive outlook). • Good relationships (customers, clients and other stakeholders). • Job satisfaction, organisational commitment (effect on productivity).
Learning outcome 2: Understand the importance of creating and maintaining effective working relationships
2A Characteristics of effective working relationships • Good communication, e.g., sharing information, listening to others. • Appropriate respectful behaviour. • Timekeeping, e.g., turning up on time, meeting deadlines. • Offering and asking for help. **2B Factors contributing to effective working relationships** • Professionalism, e.g., seeking and offering help, not disrupting own or others' work, referring requests to the appropriate people if necessary.

What needs to be learned

- Respect, including., respecting people's views, respecting diversity, being inclusive, ideas, opinions, rights and property, being polite.
- Dealing with issues, e.g., identifying and dealing with problems in working relationships, ensuring actions taken are within own responsibility/authority, resolving disagreements.
- Trust among work colleagues (difficult operations, helping each other, solving problems).

2C Importance of creating and maintaining effective working relationships

- Increased morale and job motivation.
- Effective communication, e.g., sharing ideas, pooling skills.
- Meeting deadlines, e.g., through hard work and collaboration.
- Improved productivity.
- Following correct organisational requirements (protocols, codes of behaviour).

Learning outcome 3: Understand the importance of effective team working

3A Factors that contribute to effective team working

- Characteristics of a team (shared purpose, defined roles, interdependence, effective working relationships).
- Communication with team (keeping people informed, record of actions required, sharing information).
- Managing and agreeing roles and responsibilities (leadership, sharing the workload, job description, target setting).
- Awards (team awards, sharing in the success of individuals).
- Building trust (being able to rely on colleagues, respecting diversity of perspectives, sharing common goals).
- Improved job satisfaction (performance review/appraisal).
- Planning techniques (sharing good practice).

3B Implementation of effective team-working strategies

- Team building, e.g., group work, team activities, social events.
- Shared projects, e.g., reorganising workspaces designing production layouts.
- Development, e.g., training programmes, support, case studies.
- Setting goals, e.g., shared targets, purpose of team, approach to teamwork.
- Knowledge/skills transfer, e.g., communication, priorities, strengths and weaknesses.

What needs to be learned

Learning outcome 4: Understand how to communicate effectively within a manufacturing environment

4A Importance of communication in a manufacturing environment

- Purpose of communication (to inform, to confirm, to specify, to make a request, to instruct).
- Importance of effective communication, e.g., getting things right first time, avoiding wasted time, understanding task requirements.

4B Communication methods

- Verbal, e.g., face to face, telephone.
- Written, e.g., taking notes, understanding and interpreting instructions.
- Electronic, e.g., email, text.
- Visual methods, e.g., graphs, diagrams.
- Body language, e.g., posture, facial expression, eye contact, gesture.

4C Factors to consider when communicating in a manufacturing environment

- Audience, e.g., peers, supervisors, assessors, customers.
- Environment, e.g., internal/external, noise levels.
- Urgency/importance of message, e.g., related to safety.

4D Technical information

- How to communicate technical information (written documents, technical drawings, specifications, technical data, software).
- Importance of using correct terminology and language:
  - graphical information
  - conventions, e.g., layout, line types, hatching, dimensions, tolerances, scale, colour
  - use of symbols, e.g., surface finish, circuit symbols, projection
  - standards, e.g., British (BSI), international (ISO)
  - importance of using correct terminology.
- Written documents (planning, production, schedules).
- Drawings (schematic, 2D orthographic, assembly).
- When different types of technical information are used during the manufacturing process.

What needs to be learned
Learning outcome 5: Understand how job roles can lead to career
5A Career opportunities and sources of information • Progression routes within lean manufacturing, e.g., craft/technician apprenticeship frameworks. • Importance of CPD, e.g., in-house training, external training, on-the-job training. • Different sources of information, e.g., line manager, relevant websites, trade bodies, representative bodies, trade unions. **5B Career development** • Steps to take in creating a development plan (agreeing aspirations, training needs, ongoing education, timescale and milestones with mentor guidance); review and adapt.
Learning outcome 6: Understand the role of representative bodies in the manufacturing environment
6A Main roles and responsibilities of representative bodies • Representative bodies, e.g., HSE, Institute of Manufacturing, MAKE UK, IET, Engineering Council. • The work of trade unions and professional bodies, e.g., representing and supporting employees/employers, supporting workers, lobbying government. **6B Benefits of representative bodies** • Review and set professional practice standards. • Provide professional advice on training and development, career pathways, minimum qualifications. • Influence policy relating to the sector. • Support research into issues affecting the sector. • Negotiate agreements on pay and conditions, dispute resolution.

Essential information for tutors and assessors

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. There is no specific guidance related to this unit.

Essential resources

There are no special resources needed for this unit.

Wider skills

Transferable skills

Managing Yourself	Effective Learning	Interpersonal Skills	Solving Problems
MY – TPR √	EL – MOL	IS – WC	SP – CT
MY – PS&R √	EL – CL	IS – V&NC	SP – PS
MY – COP	EL – SRS	IS – T	SP – C&I
MY – PGS	EL – PRS	IS – C&SI	

Table key

√	Signposted as part of learning. Requires additional assessment for student to achieve this TS
blank	TS not embedded or signposted in unit

Assessment

This unit is internally assessed. To achieve a grade, the evidence that students present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

Pearson has produced an Authorised Assignment Brief (AAB) to support centres in the assessment of this unit. Refer to *Section 5 Assessment requirements*.

This unit includes synoptic assessment. To complete the assessment, students are expected to draw from the knowledge and understanding learned in Unit 2, content areas 2A and 2B.

Mandatory evidence requirements

The assessment criteria specified in the unit set out the level required for students to meet pass in each of the learning outcomes.

Further requirements or clarification are given below for each learning outcome.

Learning outcome 1

- AC1.1 requires **two** characteristics of a positive working attitude.
- AC1.2 requires at least **two** factors to create a positive working attitude.
- AC1.3 requires **three** reasons for positive working attitudes.
- AC1.4 requires **three** consequences.

Learning outcome 2

- AC2.1 requires at least **two** characteristics of effective working relationships.
- AC2.2 requires at least **three** factors for effective working relationships.
- AC2.3 requires **four** reasons for creating good working relationships.

Learning outcome 3

- AC3.1 requires **four** factors that contribute to effective team working.
- AC3.2 requires **two** examples of the importance for good relationships in manufacturing environments.
- AC3.3 requires **three** descriptions of implementation.

Learning outcome 4

- AC4.1 requires **three** reasons why communication is important in a manufacturing environment.
- AC4.2 requires **three** types of communication.
- AC4.3 requires **three** factors when communicating information.
- AC4.4 requires **three** reasons for communicating correct terminology.

Learning outcome 5

- AC5.1 requires at least **two** progression routes.
- AC5.2 requires **three** sources of information.
- AC5.3 has no further requirements.

Learning outcome 6

- AC6.1 requires **two** representative bodies.
- AC6.2 requires at least two benefits to employers and employees.

Unit 2: Workplace Organisational Techniques

Level: 2

Unit type: Mandatory

Assessment type: Internal

Guided learning hours: 30

Unit in brief

Students study the principles of the lean manufacturing including the 5S and A3 methods and develop the understanding to be able to apply these approaches in a lean manufacturing environment.

Unit introduction

Effective workplace organisation and continuous improvement are at the heart of lean operations. In any role in this sector, you will be expected to help keep things clean, tidy and well organised. You will be asked to share your ideas on how to set up your workspace to make things safer, quicker or easier. You will also develop an understanding of how problems are identified and resolved. This unit will also give you a framework to help improve workplace organisation and structure your approaches to problem solving.

In this unit, you will learn how to use the '5S' method of improving workplace organisation and the A3 method for problem solving. You will gain an understanding of each phase and element of each and apply them to lean manufacturing situations.

You will build on the knowledge and skills developed in Unit 1 by applying understanding of communication in a lean manufacturing environment.

Learning outcomes and assessment criteria

To pass this unit, students need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Understand how planning, preparation and good workplace organisation support an effective manufacturing environment	1.1 Describe the planning stages for manufacturing activities in the work environment 1.2 Describe the preparation methods for manufacturing activities in the work environment 1.3 Describe how to implement effective organisation in the manufacturing workplace 1.4 Describe how to implement effective housekeeping in the manufacturing work environment 1.5 State why careful planning and preparation are important in the manufacturing environment 1.6 State the benefits of maintaining a safe and efficient working environment
2. Understand the importance of eliminating waste and having a well-organised working environment	2.1 Describe how the 7 wastes can be categorised in a lean operation 2.2 State the importance of minimising the 7 wastes of lean manufacturing in a lean manufacturing organisation 2.3 State the importance to lean manufacturing of a well-organised working environment 2.4 Explain the five phases of the 5s method of workplace organisation and their effects on the working environment
3. Be able to carry out a 5s workplace organisation audit	3.1 Carry out a 5s workplace organisation audit using a given checklist 3.2 Select actions required in the Sort phase of 5s as part of a workplace organisation audit 3.3 Select actions required in the Set-in-Order phase of 5s as part of a workplace organisation audit 3.4 Select actions required in the Shine phase of 5s as part of a workplace organisation audit

Learning outcomes	Assessment criteria
	3.5 Identify documentation required in the Standardise phase of 5s as part of a workplace organisation audit 3.6 Identify resources required in the Sustain phase of 5s as part of a workplace organisation audit
4. Be able to safely carry out the implementation of 5s in a work area	4.1 Carry out the Sort phase of 5s in a work area 4.2 Carry out the Set-in-Order phase of 5s in a work area 4.3 Carry out the Shine phase of 5s in a work area 4.4 Produce appropriate documentation to support the Standardise phase of 5s in a work area 4.5 Produce an appropriate resource to support the Sustain phase of 5s in a work area
5. Understand methods of identifying problems in lean manufacturing	5.1 Explain how the principles of Kaizen encourage workers to become involved in continuous improvement activities 5.2 Describe how Kaizen activities can be used to identify the seven wastes in a lean manufacturing operation 5.3 Describe the overall aims of the A3 method of problem solving in lean operations 5.4 Describe the techniques used in root cause analysis
6. Be able to define a problem using the A3 method	6.1 Identify appropriate metrics to quantify the problem 6.2 Describe how metrics will be measured, recorded and displayed 6.3 Define the target against which success will be measured
7. Be able to solve a problem using the A3 method	7.1 Identify the root cause(s) of the problem using a suitable method 7.2 Identify appropriate countermeasures to eliminate the problem 7.3 Implement countermeasures within limits of own responsibility to eliminate the problem

Unit content

What needs to be learned
Learning outcome 1: Understand how planning, preparation and good workplace organisation support an effective manufacturing environment
1A Planning stages • Production activity, including sequence of activities/processes, specifications (standards, drawings), raw materials and consumables to be used. **1B Preparation methods** • Types of production (jobbing, batch, continuous). • Production operations, e.g., tools and equipment, operating instructions, machine settings. **1C Importance of planning and preparation** • To meet inspection and quality procedures. • To meet health and safety precautions. • To meet environmental or legislative requirements. **1D Effective organisation and housekeeping** • Organisation – preparing and maintaining the area, e.g., accessibility for receipt and removal of materials, freedom from obstructions and hazards, preparation of tools and equipment, storage of materials and components, improvements to safety. • Housekeeping – leaving the work area in a clean, tidy and safe condition, e.g., disposal of waste, safe storage of equipment. • Benefits to be derived from a safe and efficient workplace, e.g., an efficient workplace leads to better communication between people, improved safety and quality, reduced wastage.
Learning outcome 2: Understand the importance of having a well-organised working environment
2A The 7 wastes • The 7 wastes of lean manufacturing (transport, inventory, motion, waiting, over-processing, overproduction, defects). • Methods of quantifying and monitoring waste, e.g., inspection records, scrap rates, time and motion studies, process mapping. • Actions taken to minimise waste, e.g., reorganisation, elimination of non-value-added activities, process changes.

What needs to be learned

- Effects on an organisation of minimising waste, e.g., improved productivity, greater customer satisfaction, bigger profits, employee satisfaction, improved sustainability through reduction of defects and over production.

2B The 5s method of workplace organisation

- Phases of the 5s methodology (Sort, Set in Order, Shine, Standardise, Sustain).
- Effects of the phases of 5s on workplace organisation:
    - Sort – reduce time taken to find tools/components, maximise the use of space, increased safety
    - Set in Order – improve flow of activities, increase efficiency, eliminate unnecessary movement, improve safety, reduce the 7 wastes
    - Shine – contributes to a pleasant working environment, early identification and resolution of problems
    - Standardise – establish procedures to help support and maintain ongoing Sort, Set in Order and Shine activities, keep all areas consistent
    - Sustain – develop behaviours to ensure the 5s approach to workplace organisation is continued over the long term, measures to ensure continued efficiency and sustainability through reduction of waste.
- Typical activities involved in the implementation of each phase of 5s, how these are applied in practice and their effects:
    - Sort, e.g., remove outdated or broken items or equipment
    - Set in order, e.g., assign fixed places for materials needed for work, reduction of the seven wastes
    - Shine, e.g., keep tools and equipment clean and ready for use
    - Standardise, e.g., implement colour coding, labelling system
    - Sustain, e.g., establish responsibilities, regular audits, reviews.

Learning outcome 3: Be able to carry out a 5s workplace organisation audit

3A Effective use of a 5s workplace organisation audit checklist, e.g., following audit procedures, observation skills, recording information clearly and accurately, working with others.

3B Completion of a 5S audit to identify areas for improvement:

- Sort, e.g., eliminate whatever is not needed or no longer used, addressing the seven wastes of lean
- Straighten, e.g., organise whatever remains, having a place for everything and everything in its place

What needs to be learned
○ Shine, e.g., clean the work area ○ Standardise, e.g., schedule regular cleaning and maintenance ○ Sustain, e.g., continuously review and improve workplace organisation. • Actions to address common issues identified in a 5s workplace audit, e.g., provision of cleaning materials, shadow boards, labelling, signage.
Learning outcome 4: Be able to safely carry out the implementation of 5s in a work area
4A Carrying out 5s procedures • Practical aspects of carrying out safely the Sort, Set in Order and Shine phases of 5s, following appropriate procedures, e.g., safe working practices, manual handling. • Documentation, e.g., schedules, rotas, standard operating procedures; other documentation used to support the Standardise phase of 5s, e.g., daily cleaning and inspection procedures. • Training materials and other resources used to support the Sustain phase of 5s, e.g., presentations, workshops, leaflets, posters, 'how to' guides.
Learning outcome 5: Understand methods of identifying problems in lean manufacturing
5A Kaizen • Using Kaizen activities to identify typical problems encountered in manufacturing operations, e.g., unnecessary operator movement, high scrap rates, operators waiting for components to arrive, bottlenecks, unsafe operations and the seven wastes of lean. • Principles of Kaizen, e.g., continuous improvement through small changes, teamwork, use of just-in-time (JIT), generating suggestions for improvement, employee empowerment. • Kaizen activities used to identify the seven wastes of lean in a process, e.g., value stream mapping, shop-floor walk-through, observation, data analysis, reduction of raw material wastage, use of just-in-time (JIT). **5B A3 method of problem solving** • Aims of the A3 method, e.g., to provide a structured approach to problem solving. • Stages of the A3 method (problem definition, target, root cause analysis, countermeasures, implementation, follow-up, evaluation), importance of suitable metrics (e.g., output, cycle time, lead time, throughput, productivity). • Use of A3 report templates.

What needs to be learned
• Selection, measurement, recording and display of appropriate metrics, e.g., output, cycle time, lead time, throughput, productivity. • Techniques used in root cause analysis, e.g., fishbone diagrams, brainstorming, Pareto analysis, statistical process control charts.
Learning outcome 6: Be able to define a problem using the A3 method
6A Carrying out the A3 method of defining a problem • Practical aspects of identifying and defining a problem, e.g., safe working practices, PPE. • Practical aspects defining the target, selecting, defining and measuring suitable metrics, e.g., output, cycle time, lead time, throughput, productivity. • Recording data and activities carried out clearly and legibly on an appropriate template.
Learning outcome 7: Be able to solve a problem using the A3 method
7A Carrying out the A3 method of problem solving • Practical aspects of identifying and implementing countermeasures, e.g., safe working practices, PPE. • Recording data and activities carried out clearly and legibly on an appropriate template. • Roles and responsibilities of those involved in a manufacturing process, e.g., production supervisor, quality manager. • Limits of own responsibility.

Essential information for tutors and assessors

Employer involvement

This unit would benefit from employer involvement in the form of:

- ideas to contribute to work areas where 5S could be implemented
- examples of 5s documentation
- examples of problems which can be solved using the A3 method.

Centres may involve employers in the delivery of this unit if there are local opportunities. There is no specific guidance related to this unit.

Essential resources

For this unit, centres need access to a simulated manufacturing environment in which a 5s audit can take place and the outcomes implemented. A suitable problem needs to be identified for the A3 audit.

Wider skills

Transferable skills

Managing Yourself	Effective Learning	Interpersonal Skills	Solving Problems
MY – TPR √	EL – MOL √	IS – WC√	SP – CT√
MY – PS&R √	EL – CL	IS – V&NC	SP – PS√
MY – COP	EL – SRS	IS – T	SP – C&I√
MY – PGS	EL – PRS√	IS – C&SI	

Table key

√	Signposted as part of learning. Requires additional assessment for student to achieve this TS
Blank	TS not embedded or signposted in unit

Sustainability skills

This unit maps to SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation: through identifying areas to minimise waste in quality processes.

This unit also maps to SDG 12 Ensure sustainable consumption and production patterns: through the identification of ways to reduce waste generation through prevention, reduction, recycling and reuse.

Assessment

This unit is internally assessed. To pass this unit, the evidence that students present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

Pearson has produced an Authorised Assignment Brief (AAB) to support centres in the assessment of this unit.Please see *Section 5 Assessment requirements*.

This unit includes synoptic assessment. To complete this unit assessment, students are expected to draw from the knowledge and understanding learned in Unit 1, content areas 4A, 4B, 4C and 4D.

Mandatory evidence requirements

For the practical learning outcomes (3, 4, 6 and 7), students must carry out the tasks in a practical/simulated working environment. Students must produce evidence for the practical learning outcomes in formats including:

- a research file in a work appropriate format
- sustain stage documentation in a work appropriate format
- observation records of work areas before and after implementation of 5S
- a completed 5S audit in a work appropriate format
- an A3 Audit report (replicating that provided in the Authorised Assignment Brief for this unit).

Students could produce additional evidence in a variety of formats to achieve this unit.

Further requirements or clarification are given below for each learning outcome.

Learning outcome 1

- AC1.1, AC1.3, AC1.4, AC1.5, AC1.6 have no further requirements.
- AC1.2 requires at least **two** preparation methods.

Learning outcome 2

- This learning outcome no further requirements.

Learning outcome 3

- AC3.1 requires **two** opportunities for improvements.
- AC3.2 requires **two** actions for sort phase.
- AC3.3 requires **two** actions for set in order phase.
- AC3.4 requires **two** actions for shine phase.
- AC3.5 requires **two** types of documentation used for the standardise phase.
- AC3.6 requires **two** resources for the sustain phase.

Learning outcome 4

- AC4.4 requires **two** different documents.
- AC4.1, 4.2, 4.3 and 4.5 have no further requirements.

Learning outcome 5

- AC5.1 requires **two** principles of Kaizen.
- AC5.2 requires steam mapping and observations.
- AC5.3 and 5.4 have no further requirements.

Learning outcome 6

- This learning outcome has no further requirements.

Learning outcome 7

- This learning outcome has no further requirements.

Unit 3: Producing Products by Assembly Operations

Level: 2

Unit type: Mandatory

Assessment type: Internal

Guided learning hours: 60

Unit in brief

Students study methods that can be used to produce assemblies safely and with accuracy. They then apply this knowledge to demonstrate their skills in completing practical assembly operations.

Unit introduction

This unit covers the skills and knowledge needed to prove the competences required to carry out product assembly operations that bring together a number of components in a logical sequence to construct an assembly or sub-assembly.

In this unit, you will learn how to work safely to manufacture products by assembly operations, following organisational procedures and job instructions for checking tools, aligning, positioning and fixing components. You will be able to check the quality of your work to minimise faults and waste. You will be able to resolve problems in your area of responsibility or, alternatively, you will understand who to report problems to. You will be able to complete the appropriate documentation and store products securely and safely.

You will build on the knowledge and skills developed in Unit 1, by applying understanding of working relationships and communication in a manufacturing environment to produce products using assembly and fabrication operations safely.

Learning outcomes and assessment criteria

To pass this unit, students need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Know how to manufacture products by assembly operations	1.1 Describe the relevant health and safety requirements of the assembly operations work area
	1.2 Describe the specific safe working practices, assembly procedures and environmental regulations, including ISO14001, that need to be observed
	1.3 Describe the hazards associated with carrying out the assembly operations and how they can be controlled, including the use of PPE
	1.4 Describe how to obtain and interpret necessary job instructions, standard operating procedures and assembly specifications
	1.5 Describe how to check that tools and equipment are in a safe and usable condition
	1.6 Describe specific assembly operations that need to be performed, including method for aligning, positioning and fixing components securely in position
	1.7 State the importance of following the specified assembly sequence and procedure at all times
	1.8 Describe the methods to be used to minimise waste during the assembly operation
	1.9 Describe how to check the quality of the assembly, against the required quality standards
	1.10 Describe faults, problems and variations which can occur during assembly operations and the allowable adjustments that can be made to achieve the required outcome
	1.11 Describe the documentation to be completed for the assembly operation, and the importance of completing documentation accurately and legible
	1.12 Describe own responsibilities and those of others within the assembly operation

Learning outcomes	Assessment criteria
2. Be able to manufacture products by assembly operations	2.1 Work safely at all times, complying with health and safety, environmental and other relevant regulations and guidelines to minimise waste 2.2 Follow the relevant assembly procedures, job instructions, equipment/tool operating instructions, quality specifications, company standards and procedures 2.3 Check that the products have all the necessary components, are undamaged and are in a usable condition 2.4 Secure the components in position using the specified fastening device/method 2.5 Select appropriate tools, equipment and materials to assemble products using appropriate operations 2.6 Monitor and control the assembly operation, identifying faults, variations and/or problems that occur, making permitted adjustments as appropriate 2.7 Show that adjustments were used to improve the assembly operation and final product 2.8 Report any problems that cannot be solved, or that are outside permitted authority, to the appropriate person 2.9 Carry out checks to include completeness of the assembly, component quality and freedom from damage 2.10 Work to achieve own production targets for output and quality 2.11 Show that finished products were stored correctly 2.12 Complete all documentation accurately and legibly according to appropriate procedures

Unit content

What needs to be learned

Learning outcome 1: Know how to manufacture products by assembly operations

1A Monitoring performance

- Relevant regulations, guidelines and procedures applicable to a specific work area and assembly operations (health and safety requirements, safe working practices, hazards, control measures, assembly procedures, environmental regulations including ISO14001 for the disposal of waste and waste management, emergency procedures, PPE).
- Job instructions, assembly specifications and operating procedures (obtaining, interpreting, performing, importance of following).
- Tools and equipment (use, safety and operational checks).
- Assembly operations:
  - fitting (such as filing, scraping, lapping or polishing)
  - securing by using mechanical fasteners/threaded devices
  - applying sealants/adhesives
  - assembling of products by pressure
  - component alignment, setting and adjusting
  - drilling and reaming
  - shimming and packing
  - riveting
  - positioning
  - waste minimisation including the 4Rs.
- Quality procedures (monitoring variation from specification/quality standards, faults, problems, allowable adjustments, efficient use of materials/resources).
- Quality checks (positional accuracy, freedom of movement, component security, completeness, dimensions, orientation, alignment, function).
- Documentation (use, importance of accuracy and legibility, lines of communication):
  - engineering drawings
  - work instructions (standard operating procedures, job instructions, checklists).
- Roles and responsibilities, e.g., own responsibilities (operating and using equipment, reporting faults, monitoring production), working with others, job roles (supervisor, quality control, team leader), lines of communication.

What needs to be learned
Learning outcome 2: Be able to manufacture products by assembly operations
2A Procedures, guidelines and regulations • Practical application and compliance with relevant regulations, guidelines and procedures (health and safety regulations, environmental regulations such as ISO14001, safe working practices, assembly instructions, equipment/tool operating instructions, company standards/procedures, job instructions, quality specifications, reduction of waste including the 4Rs. **2B Process for carrying out assembly operations** • Process of carrying out assembly operations (quantity and quality checks of components and materials, component positioning, fitting and securing, use of necessary tools, equipment and materials). • Carrying out assembly methods (by hand, manually operated machinery, automated machinery, combined operations). • Assembly operations (fabrication of products such as tool racks, tool trays, frameworks). **2C Monitoring performance** • Monitoring and adjusting assembly operations to improve to key performance parameters, e.g., quality, tolerance, alignment, accuracy, material utilisation, safety, productivity, manufacturing changes, reporting problems to those with authority. • Quality control checks, e.g., component position, orientation, alignment, security, component quality, freedom from damage, completeness. • Monitoring performance and production targets, e.g., volume/output, quantity, quality, reduction of waste. • Dealing with, documenting and booking in finished assemblies, safe storage of assemblies (storerooms, shelves, packaging, protective materials), completing all documentation accurately, legibly and according to procedures.

Essential information for tutors and assessors

Employer involvement

This unit would benefit from employer involvement in the form of:

- design/ideas to contribute to unit assignment/case study/project materials.

Essential resources

For this unit, centres need access to a workshop environment in which fabrication activities can be completed along with related hand tools.

Wider skills

Transferable skills

Managing Yourself	Effective Learning	Interpersonal Skills	Solving Problems
MY – TPR √	EL – MOL	IS – WC	SP – CT
MY – PS&R √	EL – CL	IS – V&NC	SP – PS
MY – COP	EL – SRS	IS – T	SP – C&I
MY – PGS	EL – PRS	IS – C&SI	

Table key

√	Signposted as part of learning. Requires additional assessment for student to achieve this TS
blank	TS not embedded or signposted in unit

Sustainability education

This unit maps to SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation: through identification of elements to support sustainable use of materials in quality processes including ISO14001.

Assessment

This unit is internally assessed. To pass this unit, the evidence that students present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

Pearson has produced an Authorised Assignment Brief (AAB) to support centres in the assessment of this unit.Please see *Section 5 Assessment requirements*.

This unit anticipates synoptic assessment. To complete this unit, students are expected to draw from the knowledge and understanding learned in Units 1 and 2

There is opportunity for holistic assessment with Units 4, 6 and 7 should the same product be referenced across these units.

Mandatory evidence requirements

The assessment criteria specified in the unit sets out the level required for students to meet pass in each of the learning outcomes.

Students may work in teams but must produce their own assessment evidence.

For the practical learning outcome (learning outcome 1), students must carry out the tasks in a practical working environment. Students must produce evidence for the practical learning outcomes in formats including:

- observation records/video evidence to confirm safe working during practical tasks.
- observation records/video evidence of practical work.
- inspection documentation in a work appropriate format.

Students could produce remaining evidence in a variety of formats to achieve this unit.

Question and answer sessions or discussions could be used to meet the requirements of learning outcome 1. Students should link and apply their knowledge and understanding of fabrication activities to the practical activities that they complete for learning outcome 2.

Further requirements or clarification are given below for each learning outcome.

Learning outcome 1

- AC1.1 requires at least **two** health and safety requirements.
- AC1.3 requires at least **two** hazards and control measures.
- AC1.8 requires at least **two** methods to minimise waste.
- AC1.11 requires at least **two** documents for assembly operation.
- AC1.2, 1.4, 1.5, 1.6, 1.7, 1.9, 1.10 and 1.12 have no further requirements.

Learning outcome 2

- This learning outcome has no further requirements.

Unit 4: Preparing, Controlling and Handing Over Manufacturing Operations

Level: 2

Unit type: Mandatory

Assessment type: Internal

Guided learning hours: 60

Unit in brief

In this unit students will develop an understanding of how to prepare for, carry out and then hand over manufacturing operations. They will then complete a range of practical activities to manufacture a product.

Unit introduction

In a manufacturing role in this sector, you will need to prepare for activities by obtaining documentation and all of the required resources. You will also be expected to monitor each stage of a manufacturing process as it is carried out and then hand over or conclude activities safely. You will need to ensure that any variation in key quality indicators, such as dimensions or surface finish, is kept within required tolerances, the correct number of products are produced, and tools and equipment are left clean and safe so that they can be used again. You will monitor performance indicators and outputs and put in place actions to solve them.

In this unit, you will first learn about how to use manufacturing information to help plan your preparation activities and then set up a work area safely and prepare the tools, equipment and materials needed for the manufacturing operations. You will then show an understanding of process monitoring and then apply these principles in a simulated working environment before carrying out completion checks and shutdown procedures.

You will build on the knowledge and skills developed in Units 2 and 4, by applying an understanding of manufacturing processes and activities. You will select and use suitable processes to manufacture and inspect products.

Learning outcomes and assessment criteria

To pass this unit, students need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Know how to prepare for a work area for manufacturing operation	1.1 Describe how to work safely when preparing for and carrying out manufacturing operations 1.2 Describe the process of clearing and cleaning a work area safely 1.3 Describe how to lay out and position tools, equipment and materials in the work area 1.4 Describe how to check and prepare tools and equipment for use 1.5 Describe the procedures used to prepare equipment 1.6 Describe the arrangements for receiving materials into the work area and the removal of finished goods 1.7 State the quality control checks required to ensure materials meet required specifications 1.8 Describe how to check that preparation is complete and correct
2. Know the relevant information required for controlling and handing over manufacturing operations	2.1 Explain how to interpret documentation used to control a manufacturing operation 2.2 Describe the production data used to control a manufacturing operation 2.3 Explain how to collect production data safely and how it is recorded 2.4 Explain how problems in a manufacturing operation are identified from production data 2.5 Describe the adjustments that can be made to a manufacturing operation to correct a problem identified in production data 2.6 Describe how to interpret documentation used when handing over a manufacturing operation 2.7 Identify when it is safe to hand over a manufacturing operation

Learning outcomes	Assessment criteria
	2.8 Describe the procedures for managing materials when concluding a manufacturing operation 2.9 Describe the checks that are carried out to confirm completion of a manufacturing operation 2.10 Describe the procedures for handling and disposal of waste material 2.11 Describe problems that can occur when concluding and shutting down a manufacturing operation and how these can be solved
3. Be able to prepare for a manufacturing operation	3.1 Clear and clean a work area safely in accordance with preparation procedures and safe working practices 3.2 Prepare suitable areas for the receipt and storage of materials 3.3 Prepare a suitable area for the storage of finished products 3.4 Obtain tools and equipment required to carry out a manufacturing operation 3.5 Check the operation, condition and safety of tools and equipment 3.6 Arrange tools and equipment appropriately for use in the work area 3.7 Obtain materials and components required to carry out the manufacturing operation 3.8 Check incoming materials and components against manufacturing documents for type, quantity and quality 3.9 Arrange materials and components appropriately for use in the work area
4. Be able to control manufacturing and handover a manufacturing operation	4.1 Follow the correct job instructions, procedures, safety requirements and any relevant production and quality specifications to control a manufacturing operation 4.2 Collect and use quality control data for a manufacturing operation 4.3 Collect performance data for a manufacturing operation

Learning outcomes	Assessment criteria
	4.4 Record and process production data accurately in a suitable and legible format 4.5 Interpret collected production data to identify any problems with the performance of a manufacturing operation or the quality of production output 4.6 Carry out pre-handover checks 4.7 Prepare and hand over equipment and the work area used in manufacturing operations 4.8 Stop the manufacturing operation and shut down all machines and equipment safely 4.9 Clean and check all machines, tools and equipment in preparation for handover 4.10 Carry out procedures for disposal of waste materials

Unit content

What needs to be learned
Learning outcome 1: Know how to prepare for a manufacturing operation
1A Manufacturing information • Issuing and obtaining manufacturing documentation, e.g., hard copy, computerised storage and retrieval, version control. • Use and interpretation of a range of manufacturing documents and information relevant when preparing for and carrying out manufacturing operations safely, e.g., safe working practices, standard operating procedures, setup procedures, job instructions, checklists. **1B Preparing the work area** • Approaches to prepare the work area safely, e.g., clearing area, cleaning, lighting, layout. • Safe movement and storage of materials, e.g., accessibility, clearance, component delivery and storage. **1C Checking equipment/tooling before use** • Safe handling, setup, condition/safety checks and procedures to prepare a range of tools and equipment, e.g., machinery, process plant, tools (handheld and portable), material handling equipment, jigs and fixtures. • Layout and positioning of tools and equipment for use in manufacturing operations, e.g., safe storage, easy access, material handling. **1D Preparing materials** • Types of materials (production, consumable, from sustainable sources). • Safe preparation, handling, identification and storage of a range of production components, e.g., Printed Circuit Boards (PCBs), mechanical components, electrical components and consumable components. • Checks carried out on production materials, e.g., availability, quantity, condition, correct identification, quality checks. • Layout and storage of production and consumable materials for use in manufacturing operations, e.g., easy access, labelling. • Preparation for storage and removal of finished goods. • Checks to confirm that the work area, materials and components are prepared and ready for use, e.g., visual inspection, checklists

What needs to be learned

Learning outcome 2: Know the relevant information required for controlling

2A Information required for controlling manufacturing operations

- Documentation, e.g., job instructions, equipment operating/adjustment procedures, quality control specifications, engineering drawings, production targets.
- Production data:
  - quality control, e.g., dimensional accuracy, surface finish
  - performance, e.g., cycle time, material usage, safety.
- Data collection, recording, processing and interpretation, e.g., checklists, inspection records, tables, charts.
- Typical manufacturing problems, indicators in collected production data, possible root causes and corrective action, adjustments that can be made (e.g., tooling, machining parameters).

2B Handover information for manufacturing operations

- Interpretation of documentation, e.g., job instructions, safe working practices, equipment handover instructions, checklists.
- Identification of a suitable point in a process when it is safe to hand over, e.g., between process steps, upon completion of a component.
- Handover procedures, e.g., pre-handover checks, checking for completion of manufacturing operations, preparation of machines, equipment and work area, safe handling and disposal of waste, management of materials and components.
- Typical problems encountered when handing over manufacturing operations, e.g., equipment not up to standard, lack of or miscommunication, non-standard procedures being followed, human error.
- Problem resolution, e.g., careful checking of equipment following operational procedures, effective two-way communication, use of logbooks.

Learning outcome 3: Be able to prepare for a manufacturing operation

3A Preparing the work area

- Safe preparation of work area, e.g., clearing area, cleaning, lighting, layout.
- Material movement and storage, e.g., accessibility, clearance, component delivery and storage.

3B Preparing equipment/tooling

- Obtaining, safe handling, setup, operation/use and condition/safety checks for a range of tools and equipment, e.g., machinery, process plant, tools (handheld and portable), material handling equipment, jigs and fixtures.

What needs to be learned
• Safety equipment, e.g., PPE, ventilation, dust/fume extraction, positioning welding screens. • Positioning tools and equipment for use in manufacturing operations, e.g., safe storage, easy access, material handling. • Mistake proofing, e.g., use of Poke Yoke, fail-safes, jigs, fixtures. **3C Preparing materials** • Types of materials (production, consumable, from sustainable sources). • Safe preparation, handling, identification and storage of a range of production components, e.g., Printed Circuit Boards (PCBs), mechanical components, electrical components and consumable components. • Checks carried out on production materials and components, e.g., availability, quantity, condition, correct identification, quality checks. • Layout and storage of production and consumable materials for use in manufacturing operations, e.g., easy access, labelling.
Learning outcome 4: Be able to control manufacturing and handover a manufacturing operation
4A Procedures and data collection for controlling manufacturing operations • Procedures and safety requirements for a manufacturing operation (health and safety and environmental regulations, standard operating procedures, safe working practices, job instructions, equipment/tool operating instructions, company standards and procedures related to production and quality). • Practical aspects of data collection and recording for a manufacturing operation, e.g., use of forms, legibility, accuracy, precision, measuring equipment. • Interpretation of collected production data to identify manufacturing problems, e.g., out of tolerance, quality of finish, machine vibration, temperature, lubricant consumption. • Types of data to collect including quality control data, e.g., dimensional data, number of rejected parts, number of parts produced, manufacturing time. **4B Handing over manufacturing operations** • Safety procedures, job instructions, safety requirements, standard operating procedures, pre-handover checks applicable when handing over a manufacturing operation.

What needs to be learned

• Preparation of equipment:
  o stopping manufacturing processes, shutting down machinery, process plant, isolating equipment
  o safe storage of hand tools, portable tools, material handling equipment
  o return of other equipment specific to the operation to stores.
• Preparation of work area (cleaning tools and equipment, equipment and materials correctly placed ready for next use, freedom from obstructions and hazards, accessible for material movements).
• Managing waste materials, e.g., disposal of swarf, slugs, scrap material, fluids, recycling of recyclable materials, reclaiming waste material that be reused.
• Handover reporting and documentation, e.g., passing on important information, signing over responsibility.

Essential information for tutors and assessors

Employer involvement

This unit would benefit from employer involvement in the form of:

- design/ideas to contribute to unit assignment/case study/project materials.

Essential resources

For this unit, centres need access to a simulated working environment in which students can prepare for, carry out and then handover a manufacturing operation. This will include:

- a range of documentation relating to the manufacture of a product (as detailed in the unit content)
- tools, equipment and materials required to carry out preparation for manufacture of a product.

Wider skills

Transferable skills

Managing Yourself	Effective Learning	Interpersonal Skills	Solving Problems
MY – TPR √	EL – MOL √	IS – WC√	SP – CT√
MY – PS&R √	EL – CL	IS – V&NC√	SP – PS√
MY – COP	EL – SRS	IS – T√	SP – C&I√
MY – PGS	EL – PRS	IS – C&SI	

Table key

√	Signposted as part of learning. Requires additional assessment for student to achieve this TS
blank	TS not embedded or signposted in unit

Sustainability education

This unit maps to SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation: through identifying areas to minimise waste in quality processes and efficiency in quality assurance processes.

Assessment

This unit is internally assessed. To achieve a grade, the evidence that students present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

Pearson has produced an Authorised Assignment Brief (AAB) to support centres in the assessment of this unit.Please see *Section 5 Assessment requirements*.

There is opportunity for holistic assessment with Units 3, 6 and 7.

Mandatory evidence requirements

The assessment criteria specified in the unit sets out the level required for students to meet pass in each of the learning outcomes.

For the practical learning outcomes (3 and 4), students must carry out the tasks in a practical/simulated working environment. Students must produce evidence for the practical learning outcomes in formats including:

- observation records/video evidence of practical work.
- observation records/video evidence to confirm safe working during practical tasks.
- collected and processed performance data.

Students could produce remaining evidence in a variety of formats to achieve this unit.

Question and answer sessions or discussions could be used to meet the requirements of learning outcomes 1 and 2. Students should link and apply their knowledge and understanding of manufacturing operations to the practical activities that they complete for learning outcomes 3 and 4.

Further requirements or clarification are given below for each learning outcome.

Learning outcomes 1

- AC1.1, AC1.2, AC1.3, AC1.4, AC1.5, AC1.6, AC1.8 have no further requirements.
- AC1.7 requires at least **two** examples of quality control checks.

Learning outcome 2

- AC2.1, AC2.2, AC2.3, AC2.4, AC2.5, AC2.7 have no further requirements.
- AC2.6 requires **two** types of documentation.
- AC2.8 requires at least **two** procedures for managing materials.
- AC2.9 requires at least **two** checks that are to be carried out.
- AC2.10 requires at least **two** procedures to be carried out.
- AC2.11 requires at least **two** problems and how they can be solved.

Learning outcomes 3

- This learning outcome has no further requirements.

Learning outcomes 4

- This learning outcome has no further requirements.

Unit 5: Transferring, Handling and Checking Materials for Manufacturing Operations

Level: 2

Unit type: Mandatory

Assessment type: Internal

Guided learning hours: 60

Unit in brief

Students study the safe working practices that need to be followed when moving and receiving materials and then demonstrate that they are able to put these procedures in to practice.

Unit introduction

The effective and safe movement and receipt of loads such as materials, components and products are critical to the workflow in lean manufacturing. The smooth and safe receipt of components and products minimises the risk of accidents or production stopping and leads to a more efficient manufacturing operation.

In this unit, you will examine relevant statutory regulations and organisational safety requirements to enable you to move and receive loads, efficiently and effectively, in a simulated manufacturing environment. You will investigate potential hazards and problems that could be encountered while lifting, moving and receiving materials. You will gain the skills and knowledge needed to show that you can transfer, move, transport, receive and check materials, from and to their correct location, within a simulated lean manufacturing environment.

You will build on the knowledge and skills developed in Units 3 and 4 by applying your understanding of safe working practices in order to demonstrate that you can move and receive materials safely.

Learning outcomes and assessment criteria

To pass this unit, students need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Know the relevant information required for transferring, receiving and checking incoming materials for manufacturing operations	1.1 Outline relevant procedures and safety regulations for lifting, receiving and transferring materials to the correct location within given timelines 1.2 Describe the correct techniques to transfer materials 1.3 Describe the correct job instructions and any relevant material specifications for the receipt of the materials 1.4 State where to obtain the correct job instructions and relevant material specifications for the transfer and receipt of the materials within given timelines 1.5 Describe how to correctly prepare the work area for the receipt of the materials 1.6 Explain the potential problems with transferring and receiving of materials and how they can be avoided 1.7 Identify who to report problems to that you cannot solve or that are outside your permitted authority
2. Be able to transfer, receive and check materials for manufacturing operations	2.1 Check the operation, condition and safety of equipment 2.2 Carry out the transfer of materials to the correct location within given timelines using different types of equipment 2.3 Interpret job instructions and material specifications in order to transfer and receive materials within given timelines for manufacturing operations 2.4 Prepare and maintain the work area for the receipt of different materials safely, as requested by the supervisor or job card/work instructions 2.5 Demonstrate safe lifting and carrying techniques in line with organisational procedures and safety regulations 2.6 Transfer materials safely, ensuring the correct items are safely loaded and secure

Learning outcomes	Assessment criteria
	2.7 Carry out the safe receipt of different materials, as requested by the supervisor or job card/work instructions 2.8 Check that incoming materials for manufacturing operations are in line with job requirements 2.9 Carry out quality checks on received materials
3. Be able to deal with problems while transferring and receiving materials for manufacturing operations	3.1 Identify problems that occur during material transfer 3.2 Carry out appropriate actions to solve problems which are within your permitted authority/responsibility 3.3 Describe any problems that you cannot solve or that are outside your permitted authority 3.4 Report to the appropriate person any problems with the materials that they cannot solve or that are outside their permitted authority

Unit content

What needs to be learned

Learning outcome 1: Know the relevant information required for transferring, receiving and checking incoming materials for manufacturing operations

1A Regulations required for transferring, receiving and checking incoming materials safely

- The requirements of health and safety legislation and regulations relating to lifting and transferring materials to the correct location within given timelines safely. The most recent legislation should be taught:
  - Health and Safety at Work etc. Act 1974
  - Personal and Protective Equipment at Work Regulations 1992
  - Manual Handling Operations Regulations 1992
  - other current and relevant legislation and regulations applicable to the manufacturing environment, including HSE guidelines and environmental regulations.
- Types of instructions, equipment, company standards and procedures applicable to transferring materials to the correct location within given timelines, including PPE.
- Importance of tidying away equipment after use.

1B Job instructions and any relevant material specifications

- Where to obtain job instructions, specification details and specific procedures.
- Types of job instructions, e.g. lifting procedures, transfer procedures, handing procedures, receiving procedures.
- How to interpret job instructions and material specifications, e.g., material type, dimensions, quantity, quality, form of supply.

1C Techniques to move, transfer and receive materials

- Lifting alone, with assistance from others, with mechanical assistance, stages of manual lifting.
- Techniques and equipment to transfer materials, e.g., by hand, hand trolley, pallet truck, block and tackle, free rolling cage.
- Equipment condition, including material weight, suitability for transferring, securing the load in place.
- Approaches to ensure materials are delivered within given timelines, including scheduling and stock control.

What needs to be learned

1D Prepare and maintain the work area for receipt of the materials
• Procedures for receipt of materials from correct locations within given timelines:
  o quality checks (concerns, damage), approaches to deal with/report in line with their responsibility
  o accessibility (freedom from obstructions and hazards)
  o delivery time of material
  o documents required for material receipt.
1E Report problems
• When and who to report problems to, depending on the situation, e.g., supervisor, quality control, production manager.
• Types of problems encountered, e.g., incorrect materials, quality not up to standard, incorrect quantity.
• Avoiding problems with materials, e.g., good communications with suppliers, careful checking of documentation, early quality checks of materials, reporting problems straight away.

Learning outcome 2: Be able to transfer, receive and check materials for manufacturing operations
2A Move materials • Equipment to move materials, including hand operated, e.g., sack barrows, cages and power operated, e.g., powered pallet trucks. • Preparing and checking equipment, e.g. condition/safety checks for a range of equipment. • Materials to be moved, e.g., raw materials, components, products. • How to return equipment to its correct location on completion. • How to complete materials and movement documentation. • Safe use of PPE. **2B Lifting and carrying** • Correct techniques for lifting alone, lifting with assistance from others. • Correct techniques for lifting with mechanical assistance, e.g., cranes, hoists. • Equipment condition, including material weight, suitability for transferring, securing the load in place.

What needs to be learned

- How to maintain materials and movement documentation.
- Safe use of PPE.

2C Work area preparations for the receipt of the incoming materials according to specified procedures

- Procedures (health and safety and environmental regulations, standard operating procedures, company procedures, job instructions, part protection).
- Interpretation of job instructions, standard operating procedures and material specifications.
- Accessibility for receipt and removal of materials (freedom from obstructions and hazards).
- Correct equipment and material layout.

2D Material transfer

- The range of items required to facilitate material transfer, e.g., stock, components, assemblies, route card, job card.
- The procedures for safe and secure loading, transferring, unloading and return of equipment to the correct location in a safe a usable condition e.g., adherence to current safety regulations in respect of handling and transferring, use of PPE, use of equipment, handling of materials that are hazardous to the environment.
- Methods of part protection, e.g., foam wraps, bubble sheet, cardboard packaging, polythene bags, film.

2E Checking/receipt of materials

- Against documentation/job requirements, including type, quantity, quality checks (e.g., dimensions, characteristics, finish, checks for damage, checking packaging for damage).
- Delivery time of materials.
- Sources of material (external sources, e.g., outside suppliers, delivery companies; internal sources, e.g., different departments, peers).
- Location of material, e.g., stores, work area.

Learning outcome 3: Be able to deal with problems while transferring and receiving materials for manufacturing operations

3A Identification of problems

- Range of problems associated with transferring materials, e.g., incorrect routing, incorrect materials, shortfall of materials, incorrect product, incorrect packaging, excess products/materials, mixed products.

What needs to be learned

- Equipment suitability, e.g., lack of moving equipment, unsafe, insecure load.
- Lack of personnel, e.g., peers, supervisor.

3B Resolving problems and permitted adjustments

- Range of permitted adjustments according to the problem that has occurred, including equipment condition, e.g., unsafe, inappropriate.
- Material suitability, e.g., irregular, fragile, fluid.
- Securing the load in place using various tie-downs (fasteners, ropes, slings, straps, chains).
- Rerouting materials to the correct area
- Informing suppliers of errors

3C Reporting problems

- Instances when problems should be reported, including those outside your permitted authority.
- Problems you cannot solve, e.g., related to quality, quantity, procedures, repairs to equipment, problems with material supply.
- Procedures for dealing with and reporting problems (what, how, when, to whom; appropriate and respectful methods of engaging).
- Appropriate person e.g., supervisor, team leader, peers, quality control, production control.

Essential information for tutors and assessors

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. There is no specific guidance related to this unit.

Essential resources

For this unit, centres need hand- and power-operated moving equipment, mechanical lifting equipment, loads to be lifted/moved/transported, PPE.

Wider skills

Transferable skills

Managing Yourself	Effective Learning	Interpersonal Skills	Solving Problems
MY – TPR √	EL – MOL	IS – WC	SP – CT
MY – PS&R √	EL – CL	IS – V&NC√	SP – PS√
MY – COP	EL – SRS	IS – T	SP – C&I
MY – PGS	EL – PRS	IS – C&SI	

Table key

√	Signposted as part of learning. Requires additional assessment for student to achieve this TS
blank	TS not embedded or signposted in unit

Sustainability education

This unit maps to SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation: through identification of elements to support sustainable use of materials by reduction of waste when transferring materials.

This unit also maps to SDG 12 Ensure sustainable consumption and production patterns: through the identification of ways to handle materials that are hazardous to the environment.

Assessment

This unit is internally assessed. To pass this unit, the evidence that students present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

Pearson has produced an Authorised Assignment Brief (AAB) to support centres in the assessment of this unit.Please see *Section 5 Assessment requirements*.

Mandatory evidence requirements

The assessment criteria specified in the unit sets out the level required for students to meet pass in each of the learning outcomes.

For the practical learning outcomes (2 and 3), students must carry out the tasks in a practical/simulated working environment. Students must produce evidence for the practical learning outcomes in formats including:

- inspection records in a workplace appropriate format
- photographs
- observation records/video evidence to confirm safe working and completion of inspections.

Students could produce additional evidence in a variety of formats to achieve this unit.

Question and answer sessions or discussions could be used to meet the requirements of learning outcome 1. Students should link and apply their knowledge and understanding of material handling to the practical activities that they complete for learning outcomes 2 and 3, however it is likely that assessment will be synoptic, and evidence will be generated for a range of assessment criteria through practical activities. Students will also draw on their knowledge and understanding from units 3 and 4 with respect to safe working practices.

Further requirements or clarification are given below for each learning outcome.

Learning outcome 1

- AC1.1 requires **three** procedures and safety regulations.
- AC1.2 requires at least **two** techniques to transfer materials.
- AC1.3, 1.4, 1.5, 1.6 and AC1.7 have no further requirements.

Learning outcomes 2

- This learning outcome has no further requirements.

Learning outcome 3

- This learning outcome has no further requirements.

Unit 6: Producing and Finishing Products

Level: 2

Unit type: Mandatory

Assessment type: Internal

Guided learning hours: 60

Unit in brief

Students study processing and finishing procedures before obtaining relevant documentation and information to carry out these activities in a simulated lean manufacturing environment.

Unit introduction

The effective and safe production of products by processing and finishing is critical to the workflow in a manufacturing environment. An orderly production process minimises the risk of stopping production and leads to a more efficient manufacturing operation.

In this unit, you will examine relevant statutory regulations and organisational safety requirements to enable you to produce products using processes and finishing techniques, efficiently and effectively, in a simulated manufacturing environment.

You will know where to obtain and how to interpret work instructions and will outline the sequence of events in the production process. You will explain potential problems that you might encounter and identify who to report problems to that you cannot solve or that are outside your permitted authority.

You will produce products, part/sub-assembly or components according to work instructions and operating procedures, and will monitor and control the production operation, making adjustments as necessary within your permitted authority. You will also complete finishing operations to enhance appearance, increase protection or improve the safety properties of the materials or products. Examples could be applying decorative coatings, applying protective coatings or removing sharp edges.

You will build on the knowledge and skills developed in Units 3 and 4, by applying understanding of health and safety and manufacturing processes to complete processing and finishing activities.

Learning outcomes and assessment criteria

To pass this unit, students need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Know the relevant information required for producing products by processing	1.1 Outline relevant regulations and procedures for producing products by processing 1.2 Describe the correct work instructions, relevant processing procedure and quality specifications for producing products by processing 1.3 State where to obtain the correct work instructions, relevant processing procedure and quality specifications for producing products by processing 1.4 Describe the predefined sequence of events required for producing products by processing 1.5 State who to report problems to that you cannot solve or that are outside your permitted authority 1.6 Explain the potential problems with producing products by processing and how they can be avoided
2. Understand the organisational procedures, health and safety legislation, environmental regulations and quality standards applicable to the finishing of products	2.1 Describe the health and safety requirements, specific safe working practices and environmental regulations relating to the finishing operations work area 2.2 Describe hazards associated with carrying out finishing operations and actions to be taken in the event of an emergency 2.3 Describe how to obtain and interpret the necessary job instructions, operating procedures and finishing specifications 2.4 Describe how to check the quality of the finished components against the required quality standards 2.5 Describe job roles and own responsibilities with regard to the reporting lines and procedures in the working area

Learning outcomes	Assessment criteria
3. Know how to safely finish products to an approved standard	3.1 Describe tools and equipment to be used for finishing purposes and how to check they are fit for purpose 3.2 Explain how to operate, monitor and control the finishing equipment to achieve the required specification 3.3 Describe the methods or procedures used to minimise waste during the finishing operation 3.4 Explain the types of faults, problems or variations that can occur in the finishing operation and how to deal with them 3.5 Explain why it is important to report faults, variations or problems that are outside own permitted authority and/or cannot be solved
4. Be able to safely carry out processing and finishing operations	4.1 Interpret work instructions, relevant processing, safety, environmental procedures and quality specifications required for carrying out processing and finishing operations 4.2 Identify risks associated with processes and implement appropriate processes and procedures to improve safety for the work required 4.3 Work safely at all times, complying with all necessary safe working practices, health and safety requirements, environmental guidelines and the handling of materials in line with supplier standards 4.4 Check that materials for producing products by processing are in line with job requirements and quality standards 4.5 Prepare and maintain the work area for producing products by processing 4.6 Carry out processing operations to produce products 4.7 Apply correct procedures when carrying out a finishing operation 4.8 Use correct finishing tools, equipment and materials to carry out a finishing operation 4.9 Produce finished products which comply with the finishing specification and quality requirements

Learning outcomes	Assessment criteria
	4.10 Carry out quality checks of the finished products to ensure conformity with required standards
5. Be able to deal with problems while carrying out processing and finishing operations	5.1 Identify problems that occur during the production of products by processing and finishing 5.2 Resolve problems with producing and finishing products by processing that are within the limits of their own responsibility 5.3 Report to the appropriate person any problems that cannot be solved or that are outside their permitted authority 5.4 Work to achieve own production targets, showing how you monitored your output volume and quality 5.5 Complete all necessary documentation accurately and legibly for finished products or components

Unit content

What needs to be learned

Learning outcome 1: Know the relevant information required for producing products by processing

1A Regulations and company procedures required for producing products by processing

- Current health, safety and environmental regulations:
  - Health and Safety at Work etc. Act 1974
  - Personal and Protective Equipment at Work Regulations 1992
  - Manual Handling Operations Regulations 1992
  - Environmental Protection Act 1990
  - Control of Substances Hazardous to Health Regulations 2002
  - other current and relevant legislation and regulations applicable to the manufacturing environment, including HSE guidelines and environmental regulations.
- Company procedures.
- Job instructions.
- Processing equipment tool operating instructions.

1B Work instructions and processing procedures

- Work instructions (operation documentation, specification details and specific procedures, SOPs, quality documentation).
- How to interpret work instructions, specification details and specific procedures.

1C Obtain information required for producing products by processing

- Where to obtain work instructions, specification details and specific procedures, SOPs, quality documentation.

1D Sequence of events required for producing products by processing

- Receive work instruction from your supervisor.
- Working instructions, e.g., planning, drawings, quality documents, specification, job cards.
- Source appropriate material and tooling.

1E Problem reporting

- When and who to report problems to, depending on the situation, e.g., supervisor, quality controller, production manager.

What needs to be learned
• Types of problems encountered, e.g., incorrect materials, quality of materials/components not up to standard, process inoperable. • Avoiding problems with process, e.g., careful checking of documentation, early quality checks of materials/product, reporting problems straight away, identification of defective materials/components. • Consequences of using materials and components that are not to the required standards.
Learning outcome 2: Understand the organisational procedures, health and safety legislation, environmental regulations and quality standards applicable to the finishing of products
2A Procedures, guidelines and regulations • Obtaining and interpreting job instructions – relevant regulations, guidelines and procedures applicable to a specific work area for finishing operations, e.g., health and safety requirements, safe working practices, job instructions, finishing specifications, operating procedures, environmental regulations. • Hazards associated with finishing operations, e.g., skin contact with aggressive chemicals, fumes from liquid coatings, metallic dust, high temperatures, electric shock, noise, sharp edges, hazardous materials, grit and swarf. • Actions to be taken in the event of an emergency, e.g., first aid, emergency services, evacuation procedures. **2B Monitoring performance** • Quality checking: o monitoring variation from specification/quality standards e.g., dimensions, materials, tolerances, surface finish o faults and problems, e.g., excessive tool marks, scratches, deformation, defects o allowable adjustments. • Documentation (use, importance of accuracy and legibility, lines of communication). • Roles and responsibilities, e.g., working with others, job roles (supervisor, quality controller, team leader), lines of communication and reporting.
Learning outcome 3: Know how to safely finish products to an approved standard
3A Processes for carrying out finishing operations • Tools and equipment (use, safety and operational checks) e.g., files, grinders, brushes, spray guns, polishing machines etc.

What needs to be learned
• Finishing operations, e.g., de-burring, brush painting, spray painting, powder coating. • Finishing work methods (operation of equipment, monitoring and adjustment of equipment settings to achieve required finish. • Minimisation of waste e.g., by recycling, reusing materials, efficient use of materials, reducing overproduction. **3B Faults and problems** • Identification of faults, problems or variations, e.g., visual inspection, checks using measuring equipment, checking against specifications. • Types of faults, e.g., issues carried forward from previous operations, damage to product and/or tooling, Incorrect materials, non-conformity when surface finishing batches of components, incorrect documentation. • Resolving problems, e.g., rework, modify finishing procedure, product redesign. • Reporting of faults, problems or variations, e.g., inspection records (paper/'e' systems), verbal to supervisor. • Importance of reporting faults, e.g., reduce accidents/incidents, prevent further faults, identify causes of problems, reduce waste.
Learning outcome 4: Be able to safely carry out processing and finishing operations
4A Preparation of the work area for processing procedures • Procedures for processing of materials within given timescales. • Interpreting documents required for processing of materials (work/operating instructions, specification details, specific procedures, process timings, take time, health and safety and environmental). • Identification of risks associated with processing and finishing operations and the countermeasures that can be put in place to improve safe working. • Quality checks (concerns, damage to process/product), deal with/report in line with their responsibility. • Procedure to stop or restart process safely. • Prepare and maintain correct process layout, e.g., tooling, material, quality instruments, receipt and removal of product, removal of waste in line with supplier standards.

What needs to be learned
4B Carry out the production of products by processing safely • Following specified procedures, regulations, risk assessments and job instructions. • Processing operations, e.g., wasting, forming and shaping, additive manufacture, heat treatment, fabrication, assembly. • Using correct tools, equipment and materials safely. • Handling and use of materials in line with supplier standards and regulations, e.g. COSHH. • Hand-processing operations, e.g., heat treatment, cutting, mixing of materials, fitting, assembly. • Manual processes, e.g., welding, brazing, vacuum forming, line bending. • Manually operated machine processing operations, e.g., photo process operations, drilling/milling using jigs and fixtures, turning, milling. • Fully automated machine-processing operations, e.g., packaging, food processing, photo process operations, assembly operations. • Combined processing operations. • Safe disposal of waste eg in accordance with COSHH regulations. • Compliance with specification and requirements. **4C Checking of equipment, tools, materials and products** • Against documentation, including requirements, type, quantity, quality, correct volume. • Location of material and tooling, e.g., stores, work area. • Monitoring produce (during/after production). • Recording of quality (check sheets, terminology), correct tools and equipment in working order and safety checked.
Learning outcome 5: Be able to safely carry out processing and finishing operations
5A Monitoring performance • Monitoring and adjusting processing and finishing operations to improve to key performance parameters, e.g., quality, accuracy, material utilisation, safety, productivity, takt time, manufacturing changes, minimisation of waste. • Monitoring own performance, e.g., volume, quantity, quality, meeting set production targets, takt time.

What needs to be learned

- Record problems, e.g., shortfall, incorrect materials, incorrect process times, incorrect from previous operation, incorrect documentation.
- Problems to report (poor quality, excess quantity, incorrect time to produce, incorrect quantity, production targets, lack of control of process, damage to process/product, damage to tooling).
- Reporting problems to an appropriate person and limits of own authority, e.g., line manager, supervisor, colleague.
- Resolving production problems and restart, e.g., reviewing processes used, pausing production until problem(s) resolved, reference to surface coating manufacturer's data sheets.

5B Completion documentation

- Documenting data about finished products accurately and legibly, e.g., production targets achieved/not achieved, inspection records.
- Hand over documentation if the finishing process is a 24/7 operation.

Essential information for tutors and assessors

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. There is no specific guidance related to this unit.

Essential resources

For this unit, centres need access to a simulated working environment in which students can carry out processing and finishing operations.

Wider skills

Transferable skills

Managing Yourself	Effective Learning	Interpersonal Skills	Solving Problems
MY – TPR √	EL – MOL √	IS – WC√	SP – CT
MY – PS&R	EL – CL	IS – V&NC√	SP – PS
MY – COP	EL – SRS	IS – T	SP – C&I
MY – PGS	EL – PRS√	IS – C&SI	

Table key

√	Signposted as part of learning. Requires additional assessment for student to achieve this TS
blank	TS not embedded or signposted in unit

Sustainability education

This unit maps to SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation: through identification of elements to support sustainable use of materials in processing and finishing processes through the reduction of waste.

This unit also maps to SDG 12 Ensure sustainable consumption and production patterns: through the identification of ways to safely dispose of waste and ways to reduce waste.

Assessment

This unit is internally assessed. To pass this unit, the evidence that students present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

Pearson has produced an Authorised Assignment Brief (AAB) to support centres in the assessment of this unit.Please see *Section 5 Assessment requirements*.
There is opportunity for holistic assessment with Units 3, 4 and 7.

Mandatory evidence requirements

The assessment criteria specified in the unit set out the level required for students to meet pass in each of the learning outcomes.

For the practical learning outcomes (4 and 5), students must carry out the tasks in a practical/simulated working environment. Students must produce evidence for the practical learning outcomes in formats including:

- Observation records/video to confirm safe working during practical tasks.
- Production and inspection documentation in workplace appropriate formats.

Students could produce additional evidence in a variety of formats to achieve this unit.

Question and answer sessions or discussions could be used to meet the requirements of learning outcomes 1 to 3. Students should link and apply their knowledge and understanding of processing and finishing to the practical activities that they complete for learning outcomes 4 and 5, students will also draw on their knowledge and understanding of the safe use of tools and equipment from other units such as 3 and 4.

Further requirements or clarification are given below for each learning outcome.

Learning outcome 1

- AC1.1 requires **two** regulations and **two** procedures.
- AC1.2, 1.3, 1.4, 1.5 and 1.6 have no further requirements.

Learning outcome 2

- AC2.1, 2.3 and 2.5 has no further requirements.
- AC2.2 requires **two** hazards and **one** emergency.
- AC2.4 requires **two** quality checks.

Learning outcome 3

- AC3.1 requires **two** examples of tools and equipment.
- AC3.3 requires **two** ways to minimise waste.
- AC3.2, 3.4 and 3.5 have no further requirements.

Learning outcome 4

- This learning outcome has no further requirements.

Learning outcome 5

- AC5.1 requires identification of **two** problems.
- AC5.2 requires **two** faults and/or variation problems.
- AC5.3, 5.4 and 5.5 have no further requirements.

Unit 7: Inspection, Analysis and Quality Production

Level: 2

Unit type: Mandatory

Assessment type: Internal

Guided learning hours: 60

Unit in brief

Students study quality control tools such as inspection and testing for a range of materials, components and products. They also analyse results of inspections and methods used to report outcomes.

Unit introduction

In a quality assurance role in this sector, you will be expected to carry out sampling, quality inspection and testing and then analyse and interpret the results of these for a range of products and components. This is to enable you to correctly identify problems with either purchased or manufactured goods in your organisation. These problems can then be addressed immediately to minimise their impact on cost, production time and the overall quality expectations of your customers.

In this unit, you will safely conduct a range of sampling, testing and inspection procedures. You will gain an understanding of the importance of these procedures and how they are organised and carried out in a realistic working environment. You will also analyse your quality inspection data, compare your results to given quality control requirements and report your findings appropriately

You will build on the knowledge and skills developed in Units 2 and 5, by applying understanding of quality control checks in a range of contexts, to ensure that materials and components meet specifications.

Learning outcomes and assessment criteria

To pass this unit, students need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Know the relevant information required for carrying out inspection and testing activities in a manufacturing environment	1.1 Describe types and uses of inspection and test equipment 1.2 Describe methods of recording quality inspection data derived from inspection and testing activities 1.3 Describe potential problems associated with carrying out sampling, inspection and testing and how they might be resolved
2. Understand the relevant information required to analyse the results of inspection and confirm quality of production	2.1 Explain why the correct interpretation of inspection data is important in a manufacturing operation 2.2 State the importance of following specified procedures to record, report and analyse inspection test results in accordance with relevant quality standards eg ISO9002 2.3 Describe how quality inspection data is collected, recorded, processed, displayed and reported. 2.4 Describe how to interpret inspection results for different sampling methods, inspection and test procedures and product types 2.5 Describe potential problems associated with analysing inspection data and how they might be resolved 2.6 Describe the actions to be taken when samples are found to be of unacceptable quality
3. Be able to carry out inspection and testing activities in a manufacturing environment	3.1 Obtain correct quality control documentation for materials, components and a finished product 3.2 Obtain, handle and transfer samples safely in line with quality control procedures 3.3 Sample and inspect materials, components and finished products safely, using a range of sampling methods in line with given constraints.

Learning outcomes	Assessment criteria
	3.4 Record and report inspection data for materials components and finished products from a range of manufacturing methods. 3.5 Complete all relevant sections of inspection documentation legibly and accurately
4. Be able to analyse the results of inspection and confirm the quality of production	4.1 Interpret inspection data for materials components and a finished product against relevant quality standards 4.2 Present inspection data for materials components and a finished product 4.3 Record the results of interpretation of inspection data for a range of product types using appropriate formats 4.4 Report the results and interpretation of inspection data to an appropriate person 4.5 Apply suitable approaches to identify and isolate any materials, components or products that do not meet quality standards
5. Be able to deal with problems during inspection, testing and analysis of results of inspections in a manufacturing environment	5.1 Identify problems or issues affecting sampling, inspection, recording and reporting of data 5.2 Propose feasible solutions to problems affecting sampling, inspection, recording, analysis or reporting of inspection data 5.3 Report problems or issues and suggested solutions

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required for carrying out inspection and testing activities in a manufacturing environment
1A Documentation • Obtaining and interpreting documentation, e.g., engineering drawings, job instructions, specifications, inspection and testing procedures. • Information to interpret, e.g., dimensions, features, tolerances, limits, fits, finishes, sampling requirements. **1B Types and uses of inspection equipment** • Importance of following specified inspection and testing procedures (in line with e.g. ISO 9002). • Types and uses of inspection equipment, e.g., callipers, micrometer, surface roughness gauge, go/no-go gauges. • Types and uses of functional testing equipment, e.g., mechanical test fixtures, electrical test rigs. • Types and uses of inspection procedures (visual inspection, measurement, functional operation). **1C Inspection records and reporting procedures** • Recording inspection data, e.g., inspection forms, tables, paper-based and electronic systems. • Reporting procedures, e.g., sending completed inspection reports, reporting problems. • Reporting of faults and variations, e.g., when to report them, who to report them to. • Appropriate people, e.g., team leader, production supervisor, quality control supervisor. **1D Common problems** • Common issues or problems encountered during sampling and inspection that might affect safety, efficiency or accuracy, e.g., damage to measuring equipment, illegible records, measuring equipment calibration overdue. • Resolution of common issues, e.g., stop/pause production, quarantine of tools/equipment/materials, record keeping.

What needs to be learned
Learning outcome 2: Understand the relevant information required to analyse the results of inspection and confirm quality of production
2A Analysing results of inspection • Working within quality standards eg ISO 9002. • Importance of efficient, accurate and timely interpretation, analysis and reporting of quality inspection data, e.g., forms, charts, tables, spreadsheets. • Interpreting documentation, e.g., job instructions, limits/tolerances, quality control specifications, engineering drawings, test procedures. • Information to interpret, e.g., dimensions, features, tolerances, limits, fits, finishes, sampling requirements. • Stages of analysis (data collection, recording, processing, display, interpretation of inspection results from sampling). • Sampling methodologies e.g., random, defined (first off, final, batch), 100%. • Inspection of raw materials, purchased components, manufactured components, finished products. • Types and use of specified inspection and testing procedures (visual inspection, measurement, functional operation). **2B Confirming quality of production** • Recording, processing and displaying inspection data, e.g., inspection forms, tables, charts and graphs. • Recording and reporting the results of interpretation of inspection data analysis, e.g., completing and sending completed inspection reports. • Common issues or problems encountered during analysis of quality inspection data, e.g., ability to process data quickly enough, reliability of data, potential issues that lie outside existing inspection criteria. • Actions taken when inspection samples are outside required quality, e.g., stock quarantine, labelling.

What needs to be learned

Learning outcome 3: Be able to carry out inspection and testing activities in a manufacturing environment

3A Safe working

- Procedures and safety requirements for sampling and inspection activities, e.g., health and safety and environmental regulations, safe working practices, machinery/equipment safety procedures, company standards and procedures.
- Procedures for selecting, handling and transfer of materials and samples, e.g. safe working practices, use of machinery/equipment, following company standards and procedures.

3B Sampling and inspection

- Quality control documentation, e.g., engineering drawings, job instructions, specifications, inspection and testing procedures, data sheets, inspection and test procedures.
- Practical aspects of safe sampling, inspection and data collection, e.g., storage and preparation of samples, time constraints, quantity of samples, roles and responsibilities.
- Sampling methods (first off, random, defined, final).
- Products (raw materials, purchased components, manufactured components, finished products).
- Manufacturing methods, e.g., hand manufacturing, manually operated machine operations, computer-controlled operations.
- Data collection, e.g., inspection forms, charts, tables, spreadsheets, graphs.

3C Inspection records and reporting procedures

- Completion of inspection records, e.g., filling in forms fully and legibly, sampling in line with constraints.
- Recording and reporting, e.g., communication methods, identifying appropriate people to report to.

What needs to be learned

Learning outcome 4: Be able to analyse the results of inspection and confirm the quality of production

4A Inspection data

- Types of inspection data, e.g. dimensions, finishes, function, tolerances.
- Interpretation of inspection data against quality standards, eg ISO9002.
- Methods of presenting inspection data, e.g., forms, tables, charts.
- Identification and isolation of materials, components or products that do not meet quality standards, e.g., labelling, isolation, quarantine, stopping production.

4B Manufacturing methods and procedures

- Manufacturing methods, e.g., hand manufacturing, manually operated machine operations, computer-controlled operations.
- Procedures and safety requirements for sampling, inspection and analysis activities, e.g., health and safety and environmental regulations, safe working practices, machinery/equipment safety procedures, company standards and procedures.

4C Processing, analysing and reporting inspection data

- Formats for recording inspection test results (tick list, written, table, electronic).
- Communication methods (verbal, handwritten, electronic).
- Practical aspects of recording and reporting inspection test results, e.g., completing forms, electronic data storage, spreadsheets, lines of communication, reporting to responsible people.

Learning outcome 5: Be able to deal with problems during inspection, testing and analysis of results of inspections in a manufacturing environment

5A Common problems

- Practical aspects of dealing with problems encountered during sampling, inspection and data collection, e.g., exchanging measuring equipment for equipment with current calibration certificate.

5B Reporting procedures

- Identifying and reporting problems or issues beyond the scope of own authority, e.g., requesting manufacture of test fixture to speed up inspection, changes to existing procedures.

5C Problem resolution

- Use a range of communication methods to confirm results of inspections.

What needs to be learned
• Practical aspects of dealing with common problems encountered during recording and reporting inspection and test results, e.g., use of email to speed up reporting.

Essential information for tutors and assessors

Employer involvement

Centres may involve employers in the delivery of this unit if there are local opportunities. There is no specific guidance related to this unit.

Essential resources

For this unit, centres need access to a simulated work environment or workshop where inspection activities can take place. They will also need access to inspection and testing equipment as outlined in the unit content.

Wider skills

Transferable skills

Managing Yourself	Effective Learning	Interpersonal Skills	Solving Problems
MY – TPR √	EL – MOL √	IS – WC√	SP – CT
MY – PS&R	EL – CL	IS – V&NC√	SP – PS√
MY – COP	EL – SRS	IS – T√	SP – C&I
MY – PGS	EL – PRS	IS – C&SI	

Table key

√	Signposted as part of learning. Requires additional assessment for student to achieve this TS
blank	TS not embedded or signposted in unit

Sustainability education

This unit maps to SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation: through realising efficiencies through inspection processes and analysis of outputs.

Assessment

This unit is internally assessed. To pass this unit, the evidence that students present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

Pearson has produced an Authorised Assignment Brief (AAB) to support centres in the assessment of this unit. Please see *Section 5 Assessment requirements*.

There is opportunity for holistic assessment with Units 3, 4 and 6.

Mandatory evidence requirements

The assessment criteria specified in the unit set out the level required for students to meet pass in each of the learning outcomes.

For the practical learning outcomes (3, 4 and 5), students must carry out the tasks for in a practical/simulated working environment. Students must produce evidence for the practical learning outcomes in the formats including:

- observation records/video of practical work being completed
- observation records/video evidence of interpretation of inspection result
- inspection records in workplace appropriate formats.

Students could produce additional evidence in a variety of formats to achieve this unit.

Further requirements or clarification are given below for each learning outcome.

Learning outcome 1

- AC1.1 requires **three** types and uses.
- AC1.2 requires description of a process, so no number is specified.
- AC1.3 requires **two** problems.

Learning outcome 2

- AC2.1 and 2.2 have no further requirements.
- AC2.3 requires **two** wo inspection methods.
- AC2.4 requires **two** methods and two types of inspection for two types of product.
- AC2.5 and 2.6 require **two** problems with associated resolutions/actions.

Learning outcome 3

- AC3.1 and 3.2 have no further requirements.
- AC3.3 requires **two** sampling methods.
- AC3.4 requires inspection data with respect to dimensions, finishes, tolerances and function.

Learning outcomes 4

- AC4.1, 4.4 and 4.5 have no further requirements.
- AC4.2 and 4.3 requires **two** methods of presenting and recording data.

Learning outcome 5

- This learning outcome has no further requirements.

11 Appeals

Centres must have a policy for dealing with appeals from students. Appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy is a consideration of the evidence by a Lead Internal Verifier or other member of the programme team. The assessment plan should allow time for potential appeals after students have been given assessment decisions.

Centres must document all students' appeals and their resolutions. Further information on the appeals process can be found in the document *Internal assessment in vocational qualifications: Reviews and appeals policy*, available on our website.

12 Malpractice

Dealing with malpractice in assessment

Malpractice refers to acts that undermine the integrity and validity of assessment, the certification of qualifications and/or may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actual or attempted actions of malpractice by students, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on students, centre staff or centres where malpractice or attempted malpractice has been proven.

Malpractice may occur or be suspected in relation to any unit or type of assessment within a qualification. For further details on malpractice and advice on preventing malpractice by students, please see Pearson's *Centre Guidance: Dealing with Malpractice* available on our website.

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Students must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The *Centre Guidance: Dealing with Malpractice* document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe a centre is failing to conduct internal assessment according to our policies. The above document gives further information and examples. It details the penalties and sanctions that may be imposed.

In the interests of students and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Student malpractice

The head of centre is required to report incidents of suspected student malpractice that occur during Pearson qualifications. We ask centres to complete *JCQ Form M1* and email it with any accompanying documents (signed statements from the student, invigilator, copies of evidence, etc) to the Investigations Processing team at candidatemalpractice@pearson.com. The responsibility for determining appropriate sanctions or penalties to be imposed on students lies with Pearson.

Students must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Students found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Failure to report malpractice constitutes staff or centre malpractice.

Teacher/centre malpractice

The head of centre is required to inform Pearson's Investigations team of any incident of suspected malpractice (which includes maladministration) by centre staff before any investigation is undertaken. The head of centre is requested to inform the Investigations team by submitting a *JCQ M2* Form (downloadable from www.jcq.org.uk/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff, anonymous informants), the Investigations team will conduct the investigation directly or may ask the head of centre to assist.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released, or they may be withheld.

You should be aware that Pearson may need to suspend certification when undertaking investigations, audits and quality assurances processes. You will be notified within a reasonable period of time if this occurs.

Sanctions and appeals

Where malpractice is proven, we may impose sanctions or penalties, such as:

- mark reduction for affected external assessments.
- disqualification from the qualification
- debarment from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures, we may impose sanctions such as:

- working with centres to create an improvement action plan.
- requiring staff members to receive further training.
- placing temporary suspensions on certification of students
- placing temporary suspensions on registration of students
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the head of centre (on behalf of students and/or members or staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in the *JCQ Appeals booklet* (www.jcq.org.uk/exams-office/appeals).

13 Further information and publications

- Edexcel, BTEC and Pearson Work Based Learning contact details: https://qualifications.pearson.com/en/contact-us.html.
- Books, software and online resources for UK schools and colleges: www.pearsonschoolsandfecolleges.co.uk.
- Our publications catalogue lists all the material available to support our qualifications. To access the catalogue and order publications, please visit our website.

Further documents that support the information in this specification:

- *Access arrangements and reasonable adjustments* (JCQ)
- *A guide to the special consideration process* (JCQ)
- *Collaborative and consortium arrangements for the delivery of vocational qualifications policy* (Pearson)
- *UK information manual* (updated annually and available in hard copy) **or** *Entries and information manual* (available online) (Pearson).
- *Distance learning and assessment policy* (Pearson)

14 Glossary

General terminology used in specification

Term	Description
Level	Units and qualifications have a level assigned to them. The level assigned is informed by the level descriptors defined by Ofqual, the qualifications regulator.
Guided learning hours (GLH)	This indicates the number of hours of activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating students, for example lectures, tutorials, online instruction and supervised study. Units may vary in size.
Total qualification time (TQT)	This indicates the total number of hours that a typical student will take to complete the qualification. This is in terms of both guided learning hours but also unguided learning, for example private study, time spent in the workplace to master skills.
Learning outcomes	The learning outcomes of a unit set out what a student knows, understands or is able to do as the result of a process of learning.
Assessment criteria	The assessment criteria specify the standard the student is required to meet to achieve a learning outcome.
Unit content	This section sets out the required teaching content of the unit and specifies the knowledge, skills and understanding required for achievement of the unit. It enables centres to design and deliver a programme of learning that will enable students to achieve each learning outcome and to meet the standard determined by the assessment criteria.
Summative assessment	Assessment that takes place after the programme of learning has taken place.
Valid assessment	The assessment assesses the skills or knowledge/understanding in the most sensible, direct way to measure what it is intended to measure.
Reliable assessment	The assessment is consistent, and the agreed approach delivers the correct results on different days for the same students and different cohorts of students.

Appendix 1 – Transferable Skills Framework

Code = transferable skill initials-skill cluster initials

Managing yourself

Code	Skill cluster	Performance descriptor
MY-TPR	Taking personal responsibility	• Demonstrates understanding of their role and responsibilities and the expected standards of behaviour. • Demonstrates compliance with codes of conduct and ways of working. • Makes use of available resources to complete tasks. • Manages their time to meet deadlines and the required standards. • Demonstrates accountability for their decisions or actions.
MY-PS&R	Personal strengths and resilience	• Identifies own personal strengths and demonstrates the ability to use these in relevant areas. • Demonstrates the ability to adapt own mindset and actions to changing situations or factors. • Uses challenges as learning opportunities.

Code	Skills cluster	Performance descriptor
MY-COP	Career orientation planning	• Undertakes research to understand the types of roles in the sector in which they could work. • Reviews own career plans against personal strengths and identifies areas for development to support progression into selected careers. • Takes part in sector-related experiences to support career planning.
MY-PGS	Personal goal setting	• Sets SMART goals using relevant evidence and information. • Reviews progress against goals and identifies realistic areas for improvement. • Seeks feedback from others to improve own performance.

Effective learning

Code	Skill cluster	Performance descriptor
EL-MOL	Managing own learning	• Maintains a focus on own learning objectives when completing a task. • Demonstrates the ability to work independently to complete tasks. • Reviews and applies learning from successful and unsuccessful outcomes to be effective in subsequent tasks.
EL-CL	Continuous learning	• Engages with others to obtain feedback about own learning progress. • Responds positively to feedback on learning progress from others. • Monitors own learning and performance over the short and medium term.
EL-SRS	Secondary research skills	• Define the research topic or question. • Uses valid and reliable sources to collate secondary data. • Interprets secondary data and draws valid conclusions. • Produces a reference list and cites sources appropriately.
EL-PRS	Primary research skills	• Define the research topic or question. • Carries out primary data collection using appropriate and ethical research methodology. • Interprets primary data to draw valid conclusions.

Interpersonal skills

Code	Skill cluster	Performance descriptor
IS-WC	Written communication	• Produces clear formal written communication using appropriate language and tone to suit purpose.
IS-V&NC	Verbal and non-verbal communications	• Uses verbal communication skills effectively to suit audience and purpose. • Uses body language and non-verbal cues effectively. • Uses active listening skills and checks understanding when interacting with others.
IS-T	Teamwork	• Engages positively with team members to understand shared goals and own roles and responsibilities. • Respectfully consider the views of team members and consistently shows courtesy and fairness. • Completes activities in line with agreed role and responsibilities. • Provide support to team members to achieve shared goals.
IS-C&SI	Cultural and social intelligence	• Demonstrates awareness of own cultural and social biases • Demonstrates diversity, tolerance and inclusivity values in their approach to working with others.

Solving problems

Code	Skill cluster	Performance descriptor
SP-CT	Critical thinking	• Demonstrates understanding of the problem or issue to be addressed. • Makes use of relevant information to build ideas and arguments. • Assesses the importance, relevance and/or credibility of information. • Analyses, interprets and evaluates information to present reasoned conclusions.
SP-PS	Problem solving	• Presents a clear definition of the problem. • Gathers relevant information to formulate proposed solutions. • Selects relevant and significant information to formulate proposed solutions. • Identifies negative and positive implications of proposed solutions. • Presents and justifies selected solutions to problems.
SP-C&I	Creativity and innovation	• Identifies new and relevant ideas to help solve a problem. • Refines ideas into workable solutions based on test results and/or feedback.

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