Higher Apprenticeship,
Production Engineering – Job Description
Advanced Manufacturing Engineering, Level 6

(Job Code and Level: EPRE003.0)

Definition:

Production Engineering defines and works out how the product will be assembled on the production line including the design packaging enabling the right quantity of components/product are delivered to support the speed of the production line. Review efficiencies and eliminate waste within the manufacturing process. Deliver high quality products/components to clearly defined standards.

Overall Purpose of the Role:

Support implementation of production processes and procedures, leading productivity improvements with project based activities, including new product introduction and manufacturing cell design to reduce waste, improve quality and safety, and reduce operating costs. Contribute to KPIs and ensure preventative actions are taken to maximise success. Works closely with more senior staff on simple projects under close supervision and work reviewed frequently. Works within well established practices and clearly defined scope of work. Plan within immediate assigned tasks and contributes to milestones. Demonstrate initiative on moderate problem solving within assigned tasks. This apprenticeship covers both manufacturing and production engineering.

Duration:

Typically the duration of this apprenticeship is 5 to 6 years. This duration may be reduced for a candidate with previous relevant experience and/or someone already part qualified. Alternatively this may also be a progression route from a relevant Advanced Apprenticeship.

Key Responsibilities:

General and Task Management

- Support the activities involved in bringing design programmes into manufacture
- Role is pivotal to the launch planning and smooth delivery of exciting new products or product refresh programmes
- Focus on the advanced manufacturing techniques and project management skills required to launch products on time, on cost and to the right quality
- Typically work closely with a range of other engineers, functions and managers both within their own company and supplier base

On successful completion, progress to develop skills in:
- Project management and scheduling engineering activities
- Securing appropriate resources and managing budgets and resources
- Implementing, monitoring and evaluating engineering processes
- Keep up with current and developing manufacturing and engineering trends
- Undertake special projects as required
- Contribute to continuous improvement activities
- Quality control of work by appropriate reviews
- Support and participate in process improvement activities
- Write simple reports and provide information to management
- Achieve goals within budget
- Conduct benchmarking studies to determine best practices/designs and future trends
- Plan projects or subtasks so they may be tracked and presented
- Be aware and work to achieve the Key Performance Indicators (KPIs)
- Attend various meetings and action/communicate instructions
- Undertake continuous training and development
- Participate in root cause analysis and resolving problems
- Independently determine approach and assigned tasks
- Agree the approach to be taken to assigned tasks

Relationship Management
- Liaise and communicate with other departments
- Support technicians and engineers

Self Management
Occupational Behaviours: Modern high value engineering organisations require their apprentices to have a set of occupational behaviours that will ensure success both in their current and future roles and in meeting the overall company objectives. These required behaviours include:
- Safety mindset: This occupation sits within an industry with a high level of safety critical activities. There has to be strict compliance and a disciplined and responsible approach to manage, mitigate and avoid risk.
- Strong work ethic: Positive attitude, motivated by engineering; dependable, ethical, responsible and reliable.
- Logical approach: Able to structure a plan and develop activities following a logical thought process, but also able to quickly “think on feet” when working through them.

- Problem solving orientation: Identifies issues quickly, enjoys solving complex problems and applies appropriate solutions. Has a strong desire to push to ensure the true root cause of any problem is found and a solution identified which prevents further recurrence.
- Quality focus: Follows rules, procedures and principles in ensuring work completed is fit for purpose and pays attention to detail / error checks throughout activities.
- Personal responsibility and resilience: Motivated to succeed accountable and persistent to complete task.
- Clear communicator: Use a variety of appropriate communication methods to give/receive information accurately, and in a timely and positive manner.
- Team player: Not only plays own part but able to work and communicate clearly and effectively within a team and interacts/ helps others when required. In doing so applies these skills in a respectful professional manner.
- Applies Lean Manufacturing Principles: Continuous improvement in driving effectiveness and efficiency
- Adaptability: Able to adjust to different conditions, technologies, situations and environments.
- Self-Motivation: A 'self-starter', who always wants to give their best, sets themselves challenging targets, can make their own decisions.
- Willingness to learn: wants to drive their continuous professional development
- Commitment: Able to commit to the beliefs, goals and standards of their own employer and to the wider industry and its professional standards.

Skills and Attributes:

During the Foundation stage the apprentice must develop a solid grasp of the core engineering skills. These skills will not only prepare the apprentice for the workplace in demonstrating that they have the required manual dexterity to do their core role but their competencies are transferable and can be built upon over time. The skills required are:

- Complying with statutory regulations and stringent organisational safety requirements
- Producing components using hand fitting, fabrication and joining techniques
- Producing Computer Aided Design (CAD) models (drawings) using a CAD system
- Preparing and using lathes, milling and other general or specialist machines and high tech equipment
- Preparing and proving Computer Numeric Control programmes
- Using computer software packages to assist with and evaluate engineering activities
- Producing and managing engineering project plans
- Producing assemblies using a wide range of materials and techniques

During the development stage they would hone their general engineering skills, along with the likes of experimental / new model development,

component investigation and problem solving, measurement, control & inspection. With all of these skills, they will be using a logical and systematic approach.

Qualifications and Experience Levels:

- Individual employers will set the selection criteria for their Apprenticeships. In order to optimise success candidates will typically have 5 GCSE's at Grade C or above, including Mathematics, English and a Science, Technology or Engineering related subject, as well as A Levels at grade C or above in both a Mathematical based subject and a Science, Technology, Engineering or additional Mathematics related subject, or 90+ credits in an Engineering BTEC at level 3.
- This standard has been designed to meet the professional standards of the Engineering Council for initial registration as an Engineering Technician (Eng Tech) in partnership with the Institution of Mechanical Engineers.
- The apprentice would complete a HND or Foundation Degree which would provide the foundation stage of the knowledge elements in the competence qualification It will support the fundamental scientific and mathematical principles that equip apprentices with the understanding required to operate effectively and efficiently at high level within this sector. As a core the engineer needs to cover around 960 academic Guided Learning Hours, in order to have a solid grasp of;-
  - Mathematics and science for engineers
  - Materials and manufacture
  - 3D Computer Aided Design and Computer Aided Engineering
  - How to run and manage business led projects
  - Engineering operations and business management
  - Manufacturing processes
  - Product improvement and engineering project management

For the Development Phase the apprentice will build on their foundation knowledge by completing a BSc (Hons) or BEng (Hons) in Engineering. Here they will expand their understanding to a higher level and commence on specialised modules during the latter part of this qualification.

Further Information:

https://www.gov.uk/government/publications/apprenticeship-standard-manufacturing-engineer

Example roles this job description may cover:

- Graduate Trainee Industrial Engineer
- Graduate Trainee Process Engineer
- Graduate Trainee Manufacturing Engineer

- Placement Trainee Production Engineer