Higher Apprenticeship, Design & Development
Job Description
Product Design & Development Engineer, Level 6

(Job Code and Level: EDES003.0)

Definition:

Design and Development is defined as: Designing systems, processes, methodologies as well as component and vehicle designs to enhance the overall vehicle performance for the customer and environment. Transforming concepts into prototypes for testing, validating and improvement for ultimately mass volume production. This includes designing to meet costs, timing and quality requirements.

Overall Purpose of the Role:

Learn to Design, Develop and Validate components. Support sub-elements of large projects, working under instruction of technical lead engineer. Develop innovative technical solutions that meet project needs, and produce CAD models for these components. Provide support to new-business and vehicle launch teams. 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. Work closely with more senior staff on simple projects. Plan within immediate assigned tasks and contributes to milestones. Demonstrate initiative on moderate problem solving within assigned tasks.

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

- Work on all stages of product creation, product modification and product componentry

- Support activities ranging from early concept feasibility, Computer Aided Design and other modelling activities and stages through to final preparation for launches and customers
- This includes working in concept studios, rapid prototyping, assembly, testing, validating and analysing performance.
- Typically will work with suppliers and managers in bringing new concepts to life or contributing to redesigns of existing product

On successful completion, progress to develop skills in:

- Project Management in undertaking engineering activities
- Establish design briefs, present and discuss technical proposals
- Manage and control product design change
- Support team feasibility design reviews
- Demonstrate technical and commercial management in planning and managing tasks and resources
- Keep up with current and developing manufacturing and engineering trends
- Undertake special projects as required
- Quality control of work by appropriate reviews
- 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 of 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
- Agree the approach to be taken to assigned tasks

Relationship Management

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

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 basic skills to do their core role but their competencies are stretching and transferable and can be built upon over time. The skills required are:

- How to comply with statutory requirements and stringent organisational safety requirements
- How to effectively use, interpret and evaluate a range of engineering data sources and documentation
- Organising work efficiently and effectively in managing engineering resources when completing tasks
- Producing components using hand fitting techniques and producing mechanical assemblies
- Producing Electrical or Electronic Drawings or CAD Models using a CAD system
- Preparing and using lathes, milling and other general or specialist high tech equipment
- Applying mechanical, electrical and electronic devices and equipment
- Using computer software packages to assist with engineering activities
- Producing and managing engineering project plans

During the development stage they would hone and deepen their general engineering skills in there specialist areas and also may undergo placements in relevant supportive functions to provide breadth of experience. With all of these skills, they will be using a well-planned 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. The Apprenticeship as a Product Design and Development Technician provides a potential preparation route for this Apprenticeship.
- 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
  - Mechanical. electrical and electronic principles and applications
  - Statics and dynamics
  - How to undertake and apply business-led projects
  - Engineering operations and business management
  - Applying advanced technology techniques

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-product-design-and-development-engineer

Example roles this job description may cover:

- Graduate Trainee Design Engineer
- Placement Trainee Design Engineer