



**August 2021**

## **Information on critical competences for holistic assessment**

### **Group award title: HND Aircraft Engineering (at SCQF level 8)**

**Group award code: GK7D 16**

[https://www.sqa.org.uk/files\\_ccc/GK7915\\_GK7D16.pdf](https://www.sqa.org.uk/files_ccc/GK7915_GK7D16.pdf)

#### **Group award aim (specific)**

- ◆ Provide learners with an articulation route to degree level studies in aircraft/aeronautical engineering.
- ◆ Develop learners knowledge, understanding and practical skills consistent with progression to, and within, careers in aircraft/aeronautical engineering.
- ◆ Develop learners ability to interpret and apply analysis skills to the solution of aircraft/aeronautical engineering related problems.
- ◆ Develop learners ability to synthesise and evaluate the solution of aircraft/aeronautical engineering problems.
- ◆ Develop learners skills to investigate and research topics in aircraft/aeronautical engineering.
- ◆ Develop learners knowledge and understanding of the importance of safety in all aspects within an aircraft/aeronautical engineering context including Human Factors.
- ◆ Develop learners ability to effectively use a range of communication skills relevant to the needs of aircraft/aeronautical engineers.
- ◆ Develop learners ability to apply principles of engineering project planning and implementation.
- ◆ Provide learners with the underpinning knowledge to support related National Occupational Standards in aircraft/aeronautical engineering.
- ◆ Provide learners with a qualification that meets the educational requirements that contributes to the attainment of professional registration with the UK Engineering Council as an Engineering Technician.

## Key critical competences and units

Critical competences are shown in **bold**.

### H7MB 34 Communication: Practical Skills

This unit Communication: Practical Skills sits at SCQF level 7 and is designed to develop skills in **analysing, summarising, evaluating and producing complex written information in a practical vocational context**. It also develops skills in presenting and responding to **complex oral information in a practical vocational context**. The unit enhances skills for learning, life and work and there is a particular emphasis on employability

### H7K1 34 Engineering Mathematics 2

This unit is designed to develop the necessary mathematical skills required of learners seeking to use a Higher National Diploma in Engineering as an exit qualification for an Engineering workplace role or as a pathway to further studies in mathematics at an advanced level. The unit provides learners with opportunities to develop knowledge, understanding and skills **to solve problems involving trigonometric and hyperbolic functions and identities; to differentiate and integrate a wide range of functions and use differentiation and integration techniques to solve Engineering problems**

### H7K2 34 Engineering Mathematics 3

This unit is designed to develop a greater breadth mathematical skills required of learners seeking to use a Higher National Diploma in Engineering as a pathway to further studies in mathematics at an advanced level, including articulation to university degree study. The unit will provide learners with opportunities to develop the knowledge, understanding and skills **to apply a range of differential and integral calculus techniques to the solution of mathematical problems**

### H94D 34 Physics for Aviation

This unit is designed to provide learners with the necessary knowledge, understanding and skills in physics subjects needed to solve engineering problems in an aviation context. The unit is delivered using an applications approach to **solve fundamental aircraft engineering problems in solid mechanics, thermofluids, wave motion and mechanical vibration**. Such applications will provide a foundation to progress to further studies in aerodynamics, aircraft structural mechanics and aircraft systems as well as fibre optic technology used in modern avionics.

### H94G 34 Aerodynamics and Flight Mechanics 1

This unit is designed to introduce learners to the subject of **aircraft aerodynamics and how this influences how an aircraft performs throughout the flight envelope**. The unit should provide the learner with a working knowledge of the subject and develop the learner's awareness of how an aircraft flies and how the aerodynamic forces produced in flight are generated and affect an aircraft. Learners will also study **the layout and configuration of different aircraft types and investigate aircraft control and lift augmentation**.

### H94F 34 Aircraft Structures and Materials

This unit is designed to allow learners to acquire an in-depth knowledge and understanding of **the types of materials and structures used in modern aircraft construction**.

### **H94K 34 Aircraft Propulsion Systems: Introduction**

This unit is designed to introduce learners to the main concepts of Aircraft Propulsion. It will allow the learner to gain an understanding of the **basic propulsive processes regarding both piston and gas turbine cycles**. In addition, learners will also achieve a working knowledge of **aircraft gas turbine and piston engine ancillary systems**.

### **H94J 34 Human Factors for Aircraft Engineering**

This unit is designed to allow learners to acquire a knowledge and understanding of **human factors and how they affect an individual's performance in the workplace**. In particular the unit will look at how **human factors apply to an aircraft engineering maintenance environment**. The unit will also provide the knowledge element aligned to EASA guidance to human factors in the aircraft maintenance environment.

### **H94R 35 Aerodynamics and Flight Mechanics 2**

This unit is designed to enable learners to build on the knowledge developed in the unit Aerodynamics and Flight Mechanics 1 at SCQF level 7. The unit should provide the learner with a greater knowledge of the subject and develop their awareness of important **facets of aircraft flight such as stability and performance**. Learners will also be provided with an overview of how **an aircraft is designed to improve aerodynamic efficiency and the impact flying at transonic and supersonic speeds has on aircraft aerodynamics**

### **Key critical evidence**

Candidates may have completed some units and have other units that are partially complete or incomplete.

It is anticipated that the majority of candidate evidence will be gathered by traditional or online methods (such as simulation and online testing), as well as through completed practical work.

Some units require evidence of practical activity, which may be difficult to gather under the current circumstances. If this is the case, alternative evidence can be used from other units.

However, any evidence gathered must be appropriate to the level of the unit and the award.

If you have any questions, please contact [qualifications.development@sqa.org.uk](mailto:qualifications.development@sqa.org.uk).