

# **Module Synopses**

## **MC 1 - Certificate in Aircraft Maintenance Practices (AMP)**

### **Materials and Hardware**

This module introduces to participants different types of aircraft material, both ferrous and non ferrous. It then proceeds to teach the installation and removal procedures for various fastening devices, lines and fittings, control cable, springs, bearings and transmission devices. Inspection procedures for condition and/or correct installation are also taught where appropriate.

### **Aircraft Maintenance Practice**

This module first impresses upon participants important safety precautions to be adopted when working on aircraft and workshops. It then introduces the basic techniques for reading and interpreting engineering drawings, line diagrams and schematic drawings, standards, technical manual and maintenance procedures followed by use, care and control of aircraft workshop tools and equipment, corrosion prevention and control methods, disassembly, inspections and repair techniques, and joining processes namely; soldering, brazing, welding.

### **Sheet Metal and Composite Repairs**

This is a practical module emphasizing on repairs practices, sheet metal bending, drilling and riveting. It dwells on the various repairs techniques in use and the underlying principle behind each technique. Practical includes structural and stressed skin repairs, structural sealing, composite material inspection, damage assessment and standard practices for composite repairs.

## **MC 2 - Certificate in Aviation Science (AVS)**

### **Theory of Flight**

This module aims to provide students with a basic understanding of the physics of flight of heavier than air flying machines. It begins with an introduction to the regions and properties of the earth's atmosphere followed by basic aerodynamics, aerofoil and other aerodynamic shapes, elements of aircraft performance, aircraft stability & control and high speed flight.

### **Physics**

The aim of this module is to provide students with a fundamental knowledge of Physics required to understand the principles behind aircraft mechanics and engines. Topics covered include the Theory of Matter, Mechanics, Thermodynamics, Optics, Wave Motion & Sound, Static Electricity and Wheatstone bridge. This module will provide the foundation for the Aeronautical Engineering Science module.

### **Human Factors**

This module introduces to students the concept of Human Factors and its effect on human performance and limitations. Topics covered include social psychology, factors affecting performance, the physical environment, tasks, communication, human error and hazards in the workplace. This module is taught through case studies of incidents in both the shop floor and on board aircraft that had led to various fatal as well as non-fatal mishaps.

## **Air Legislation & Management**

This module provides a basic knowledge of Singapore aviation legislation covering the regulatory framework placing specific emphasis on aircraft maintenance. Concepts of the structure and management of aerospace organisations and considerations for enhancing productivity and business performance are covered. Topics taught also include functions of a supervisor, leadership and communication skills, teamwork, etc.

## **MC 3 - Certificate in Aircraft Propulsion Systems (APS)**

### **Internal Combustion Engines and Propellers**

This module introduces students to 4-stroke cycle internal combustion gasoline and jet-fuel aircraft piston engines. Topics covered include basic engine performance and power calculations, followed by an introduction to the mechanical parts of engines, engine systems – induction, oil, fuel, fuel metering, ignition and starting, engine indication system and ground operation, propeller theory and its operation

### **Gas Turbine Engines**

This module introduces students to aircraft gas turbine engines and their operations, basic engine performance and thrust calculations, construction and nomenclature followed various engine systems – fuel, oil, air, ignition and starting and engine indicating, warning and control systems. The module concludes with engine storage and preservation

### **Introduction to Thermofluids**

This module provides students with a basic knowledge of fluid mechanics and thermodynamics. Topics covered include basics of fluid mechanics, perfect gas and steam.

## **MC 4 - Certificate in Aircraft Structures & Systems (ACSS)**

### **Aircraft Structures**

This module aims to provide students with a basic knowledge of aircraft anatomy and its various designs and features, various structural maintenance practices of the aircraft that includes the process of weight and balance/symmetry checks and basic concepts of design and analysis of aircraft structures and modification.

### **Aircraft Hydraulic Systems**

This module introduces students to basic hydraulic fundamentals and principles of operation of such systems on aircraft. The topics covered include; hydraulic fluids and seals, types and use; fluid lines and fittings, types and functionality; hydraulic system components, roles and functionality; and aircraft hydraulic systems and specified basic components found in aircraft systems.

### **Aircraft Systems**

To provide students with the knowledge of aircraft air conditioning and pressurisation systems, namely their working principles and terminology, air supply systems, temperature and pressure control. Fundamental concepts and basic understanding of aircraft fire, ice, rain protection and oxygen systems are also taught as well as fuel systems and waste and water systems.

## **MC 5 - Certificate in Aircraft Electrical & Instrument Systems (AEIS)**

### **Principles of Electrical & Electronic Engineering**

This module introduces the basic electrical concepts with respect to direct and alternating currents followed by diodes and transistors, logic gates, digital systems and computer basics.

### **Aircraft Electrical & Instrument Systems**

This module covers the fundamentals of electrical and instruments systems in use on aircraft namely; battery systems, D C generators & motors, A C generators & motors, pitot-static instrument systems, gyroscopic instruments, engine instruments and compasses.

### **Aircraft Communication and Navigation Systems**

This module introduces to participants the communication and navigation systems found on cockpit instrument displays namely; VHF/HF communication systems & emergency locator transmitters (ELT), Marker systems, VHF Omni-directional range (VOR), instrument landing system (ILS), microwave landing system (MLS), automatic direction finder (ADF), flight management, area navigation (RNAV) and radar systems. It also dwells into weather radar, Doppler navigation & radio altimeter and secondary radar & satellite navigation systems.



## **MC 5 - Certificate in Aviation Science (AVS)**

### **The Aviation Industry Sector**

This module provides students with a broad perspective of the various sectors within the aviation industry sector in general. The sectors covered include air transport pilot's licence, air traffic control, Singapore airworthiness requirements (SAR), ground handling and safety, aircraft maintenance, repair & overhaul (MRO), aerospace components manufacturing and aviation services & management (project-based).

### **Theory of Flight**

This module aims to provide students with a basic understanding of the physics of flight of heavier than air flying machines. It begins with an introduction to the regions and properties of the earth's atmosphere followed by basic aerodynamics, aerofoil and other aerodynamic shapes, elements of aircraft performance, aircraft stability & control and high speed flight.

### **Aircraft Construction**

This module provides students with an introduction to aircraft design concepts and requirements selected so they can be built into an aircraft. The student is taught the different types of stresses, i.e., tension, compression, bending and torsion acting on five major units of a fixed-wing aircraft namely; fuselage, wings, stabilizers, flight controls surfaces and landing gear.

### **Human Factors & Error Management**

This module introduces to students the concept of Human Factors and its effect on human performance and limitations. Topics covered include social psychology, factors affecting performance, the physical environment, tasks, communication, human error and hazards in the workplace. This module is taught through case studies of incidents in both the shop floor and on board aircraft that had led to various fatal as well as non-fatal mishaps.