# MODULE 6. MATERIALS AND HARDWARE

## 6.1 Aircraft Materials — Ferrous

(a) Characteristics, properties and identification of common alloy steels used in aircraft;
Heat treatment and application of alloy steels;

(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.

## 6.2 Aircraft Materials — Non-Ferrous

(a) Characteristics, properties and identification of common non-ferrous materials used in aircraft;
Heat treatment and application of non-ferrous materials;

(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.

## 6.3 Aircraft Materials - Composite and Non- Metallic

### 6.3.1 Composite and non-metallic other than wood and fabric

Characteristics, properties and identification of common composite and nonmetallic materials, other than wood, used in aircraft; Sealant and bonding agents.

## 6.4 Corrosion

(a) Chemical fundamentals; Formation by, galvanic action process, microbiological, stress;

(b) Types of corrosion and their identification;
Causes of corrosion;
Material types, susceptibility to corrosion.

## 6.5 Fasteners

### 6.5.1 Screw threads

Screw nomenclature;
Thread forms, dimensions and tolerances for standard threads used in aircraft;
Measuring screw threads;

### 6.5.2 Bolts, studs and screws

Bolt types: specification, identification and marking of aircraft bolts, international standards;
Nuts: self-locking, anchor, standard types;
Machine screws: aircraft specifications;
Studs: types and uses, insertion and removal;
Self-tapping screws, dowels.

### 6.5.3 Locking devices

Tab and spring washers, locking plates, split pins, palnuts, wire locking, quick release fasteners, keys, circlips, cotter pins.

#### 6.5.4 Aircraft rivets

Types of solid and blind rivets: specifications and identification, heat treatment.

### 6.6 Pipes and Unions

(a) Identification of, and types of rigid and flexible pipes and their connectors used in aircraft;

(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.

### 6.7 Springs

Types of springs, materials, characteristics and applications.

### 6.8 Bearings

Purpose of bearings, loads, material, construction;
Types of bearings and their application.

### 6.9 Transmissions

Gear types and their application;
Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns;
Belts and pulleys, chains and sprockets.

### 6.10 Control Cables

Types of cables;
End fittings, turnbuckles and compensation devices;
Pulleys and cable system components;
Bowden cables;
Aircraft flexible control systems.

### 6.11 Electrical Cables and Connectors

Cable types, construction and characteristics;
High tension and co-axial cables;
Crimping;
Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.