

AEPC2006 AIRCRAFT MATERIALS AND MANUFACTURING (3-0-0)

Module-1: Aircraft Engineering Materials (6 HRS)

Engineering materials Steels, Solid solutions, Binary phase diagrams, study of iron, iron carbon phase diagram, heat treatment, annealing, normalizing, hardening and tempering of Aluminium and steel, Non-Ferrous metals and Alloys: Structure and properties of copper and its alloys, Aluminium and its alloys, Titanium and its alloys.

Module-2: Casting, Welding and Inspection Techniques (6 HRS)

General principles of various casting processes Sand casting, die-casting, centrifugal casting, investment casting, Shell moulding types; Principles and equipment used in arc welding, gas welding, resistance welding, solid, laser welding, and electron beam welding, soldering and brazing techniques. Need for NDT, ultrasonic testing, Radiographic testing, Flight-testing.

Module -3: Sheet Metal Processes in Aircraft Industry (6 HRS)

Sheet metal operations: shearing, punching, super plastic forming; operations in bending like stretch forming spinning drawing. Riveting, types and techniques, equipment, fasteners, integral tanks, Jigs and Fixtures.

Module-4: Conventional and Modern Manufacturing Processes (6HRS)

General working principles, applications and operations of lathe, shaper, milling machines, grinding, drilling machine, computer numeric control machining. Working principles and applications of abrasive jet machining, ultrasonic machining, Electric discharge machining and electro chemical machining, laser beam, electron beam, plasma arc machining. Rapid prototyping, Additive manufacturing process.

Module-5: Aircraft Composites(6HRS)

Introduction, Physical metallurgy, wrought aluminium alloys, Cast aluminium alloys, Production of semi-fabricated forms, Aerospace applications, Plastics and rubber, Introduction to fiber reinforced plastics, glass and carbon composites; Fibers and resins; Characteristics and applications, Classification of aircraft materials.

TEXTBOOK:

1. Aircraft Production Technology and Management, S. C. Keshu, K. K. Ganapathy, Interline Publishing House, Bangalore, 3rd Edition/1993.
2. Aircraft Production Technology, Douglas F. Horne, Cambridge University Press, 1st Edition/1986.