



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

AEROSPACE MATERIALS AND PRODUCTION TECHNOLOGY LABORATORY								
IV Semester: AE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AAED13	Core	L	T	P	C	CIA	SEE	Total
		-	-	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45			Total Classes: 45			
Prerequisite: Aircraft Materials and Production								

I. COURSE OVERVIEW:

The Aircraft Production Technology lab encompasses on providing sound practical knowledge on testing of engineering material and conventional machining process which plays a vital role in designing the components with minimum cost and with longer service.

II. COURSE OBJECTIVES:

The students will try to learn:

- I. The basic material properties to identify the suitable applications in aerospace industries.
- II. The conventional machining techniques required for aircraft production.
- III. The tooling and material joining technique used in aircraft assembly.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

- CO1 Identify the microstructures of the materials for selecting the suitability in industrial applications
- CO2 Illustrate various jobs for joining the materials using welding operation in real time applications.
- CO3 Identify the types of machining process required for producing desired shape of components used in Aerospace and allied industries.
- CO4 Demonstrate molding processes and their application for producing machine components used in industries.
- CO5 Select the suitable tools and process parameters required in machining, drilling and slotting operations for producing components with minimum cost
- CO6 Illustrate various jobs for joining the materials using Riveting operation in industries.

IV. COURSE CONTENT

Week-1 BASIC METALLURGY -I

Preparation and study of microstructure of pure materials like Cu and Al.

Week-2 BASIC METALLURGY -II

Study of microstructures of non-ferrous alloys and heat-treated steel.

Week-3 LATHE OPERATIONS -I

Introduction- lathe machine, plain turning, Step turning & grooving.

Week-4 LATHE OPERATIONS -II

Taper turning-compound rest/offset method & Drilling using lathe, External threading-Single start

Week-5 SHAPING

Shaping-V-Block

Week-6 SLOTTING

Slotting-Keyways.

Week-7 MILLING

Milling-Face milling, End milling and Side milling

Week-8 GRINDING

Grinding-Cylindrical /Surface/Tool & cutter.

Week-9 DRILLING

Drilling, reaming, counter boring, Counter sinking and Taping.

Week-10 WELDING PROCESSES I

Gas Welding, Brazing and Soldering.

Week-11 WELDING PROCESS II

Arc welding and Spot welding

Week-12 BASIC CASTING

Preparation of casting with simple patterns.

Week-13 Injection Moulding

Blow Moulding and Injection Moulding

Week-14 Additive Manufacturing

To perform Fused Deposition Modelling (FDM) process to produce a part.

V. TEXT BOOKS:

1. Keshu S. C, Ganapathy K. K, "Air craft production techniques", Interline Publishing House, Bangalore, 3rd Edition, 1993.

VI. REFERENCE BOOKS:

1. R. K Jain-Khanna, "Production technology", McGraw Hill, 1st edition, 2002.
2. O. P Khanna, Lal. M. DhanpatRai, "Production technology, 5th edition, 1997.
3. C. P. Paul, A. N. Jinoop, "Additive Manufacturing", McGraw Hill India 1st edition, 2021,

VII. ELECTRONICS RESOURCES:

1. www.loc.gov/rr/scitech/tracer-bullets/aerodynamicstb.html
2. www.myopencourses.com/subject/aerodynamics-2

VIII. MATERIALS ONLINE

1. Course template
2. Lab manual