INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad – 500043

Aeronautical Engineering

List of Laboratory Experiments

AIRCRAFT PRODUCTION TECHNOLOGY LABORATORY								
CourseCode	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
AAEC13	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		0	0	2	1	30	70	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes:24**				**Total Classes: 24**		
Branch: AE	**Semester: IV**	**Academic Year: 2021-22**				**Regulation: UG20**		

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.

Course objectives:

The students will try to learn:

I. The basic material properties for choosing suitable materials for designing Aerospace components.
II. The Conventional Machining Techniques used in aerospace industries for producing components.
III. The concepts and applications of casting processes used in Aerospace industries.
IV. The tooling and material joining technique used in aircraft assembly for producing larger components.

Course outcomes:

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

CO 1 **Identify** the microstructures of the materials for selecting the suitability in industrial applications.
CO 2 **Illustrate** various jobs for joining the materials using welding operation in real time applications.
CO 3 **Identify** the types of machining process required for producing desired shape of components used in Aerospace and allied industries.
CO 4 **Demonstrate** moulding processes and their application for producing machine components used in industries.
CO 5 **Select** the suitable tools and process parameters required in machining, drilling and slotting operations for producing components with minimum cost.
CO 6 **Illustrate** various jobs for joining the materials using Riveting operation in industries

WEEK NO	EXPERIMENT NAME	Course Outcomes
WEEK – I	**BASIC METALLURGY – I**	CO1
	Preparation and study of microstructure of pure materials like Cu and Al.	
WEEK–II	**BASIC METALLURGY – II**	CO1
	Preparation and Study of Microstructure of a. Nonferrous alloy b. Heat treated steels	
WEEK–III	**WELDING PROCESS – I**	CO2
	Prepare a Butt Joint using a. Gas Welding b. Brazing c. Make connections in circuits using soldering process	
WEEK–IV	**WELDING PROCESS – II**	CO2
	a. Prepare a V – Butt Joint using Electric Arc Welding Process. b. Prepare a lap Joint on the given work pieces using spot welding equipment.	
WEEK– V	**LATHE OPERATIONS – I**	CO3
	Perform plain turning, step turning and Grooving on a circular rod so as to obtain the required design using lathe machine.	
WEEK– VI	**LATHE OPERATION – II**	CO3
	Perform the drilling, tapering and External threading operations on a circular rod so as to obtain the required dimensions using lathe machine.	

WEEK– VII	**BASIC CASTING**	**CO4**
	Prepare a Aluminium Casting for the given Solid Pattern using Green Sand Molding Processes.	
WEEK–VIII	**SHAPING**	**CO5**
	Perform the Making of V-Block on a work piece so as to obtain the required dimensions using shaping machine.	
WEEK-IX	**SLOTTING**	**CO5**
	Prepare the key slots with the help of the slotting machine as per the given dimensions.	
WEEK- X	**MILLING**	**CO5**
	Perform the Face milling & Side milling operations on a rectangular work piece so as to obtain the required dimensions using milling machine.	
WEEK- XI	**GRINDING**	**CO5**
	Perform cylindrical and surface grinding on a work piece so as to obtain the required dimensions using grinding machine.	
WEEK- XII	**DRILLING**	**CO6**
	Perform the boring, reaming, counter sinking and tapping operations on a rectangular work piece so as to obtain the required dimensions using drill machine.	