

AIRCRAFT PRODUCTION TECHNOLOGY

VI Semester								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
A5AE24	ESC	L	T	P	C	CIE	SEE	Total
		3	0	0	3	30	70	100
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. Emphasis is given to process capabilities and limits, tooling considerations, materials requirements and constraints, economics of production and design producibility 2. Introduction to Manufacturing Technology is a broad exploratory course that introduces students to the manufacturing industry 3. Though hands-on activities students will learn how manufactures use technology to change raw materials into finished products 4. The courses also introduce students to the principles and practices of modern aircraft manufacturing. Specific manufacturing processes are addressed as they relate to the production of major aircraft components made of conventional metals as well as fiber reinforced plastic composites. 								
UNIT-I	CASTING & WELDING							
General principles of various Casting Processes - Sand casting, die-casting, centrifugal casting, investment casting and shell molding types. Principles and equipment used in arc welding, gas welding, resistance welding, Laser welding , Electron Beam welding, Soldering and brazing techniques								
UNIT-II	MACHINING AND FORMING							
General Principles (with schematic diagram only) of working and types-lathe, shaper, milling machines, grinding, drilling m/c, CNC machining. Sheet metal operations-shearing, punching, super plastic forming and diffusion bonding. Bending, Automation in bend forming and different operations in bending like stretch forming, spinning, drawing etc								
UNIT-III	UNCONVENTIONAL MACHINING							
Principles of working and applications of abrasive jet machining, ultrasonic machining, electric discharge machining, electro chemical machining, laser beam, electron beam and plasma arc machining								
UNIT-IV	HEAT TREATMENT AND SURFACE FINISHING							
Heat treatment of Aluminum alloys, titanium alloys, steels, case hardening, Initial stresses and the stress alleviation procedures. Corrosion prevention, protective treatment for aluminum alloys, steels, anodizing of titanium alloys, organic coating, and thermal spray coatings								
UNIT-V	JIGS & FIXTURES, NDT AND OTHER INSPECTION TECHNIQUES							
Jigs, fixtures, stages of assembly, types and equipment for riveted joints, bolted joints. Aircraft Tooling Concepts. Dye Penetrant Test, X - ray, magnetic particle and ultrasonic testing.								
Text Books:								
<ol style="list-style-type: none"> 1. Kalpakjianserope (2011), Manufacturing Engineering and Technology, 5th edition, Pearson Education, New Delhi, India. 2. Manufacturing Technology, P.N. Rao,TMH ,R.K.Jain 								
Reference Books:								

1. Keshu S. C, Ganapathy K. K (2012), Air craft production techniques, E-book, Interline Publishing House, Bangalore.
2. P. C. Sharma (2011), Manufacturing Technology - I & II, 1st edition, S. Chand & Company Ltd. New Delhi

COURSE OUTCOMES:

Students should able to

1. Compare between primary shaping and joining processes
2. Analyze the working of various material removing techniques by conventional machining processes
3. Compare the working of various material removing techniques by unconventional machining processes
4. Analyze the various heat treatment technique used in aerospace industries
5. Determine the methods used to identify the manufacturing defects