

## AIRCRAFT PRODUCTION TECHNOLOGY

<b>V Semester: AE</b>								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AAEB16	Core	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
<b>Contact Classes: 45</b>		<b>Tutorial Classes: Nil</b>		<b>Practical Classes: Nil</b>		<b>Total Classes: 45</b>		
<b>OBJECTIVES:</b>								
<b>The course should enable the students to:</b>								
I. Study the composition of microstructures of metals and alloys with their applications in aerospace industry.								
II. Discuss the various manufacturing processes and selection of process for suitable applications.								
III. Understand the working principles and applications of conventional and unconventional machining along with their advantages and disadvantages.								
IV. Demonstrate the importance of composites with their applications in different areas of aerospace industry.								
<b>MODULE-I</b>	<b>AIRCRAFT ENGINEERING MATERIALS</b>						<b>Classes: 09</b>	
Engineering materials Steels, study of iron, iron carbon phase diagram, heat treatment-annealing, normalizing, hardening and tempering of Aluminum and steel, Non-Ferrous metals and Alloys: Structure and properties of copper and its alloys, Aluminum and its alloys, Titanium and its alloys, Corrosion - Types of Corrosions - Prevention – Protective Treatments.								
<b>MODULE-II</b>	<b>CASTING, WELDING AND INSPECTION TECHNIQUES</b>						<b>Classes: 09</b>	
General principles of various casting processes Sand casting, die-casting, centrifugal casting, investment casting, Shell molding 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 and Radiographic testing.								
<b>MODULE-III</b>	<b>SHEET METAL PROCESSES IN AIRCRAFT INDUSTRY</b>						<b>Classes: 09</b>	
Sheet metal operations: shearing, punching, super plastic forming; operations in bending like stretch forming spinning drawing. Riveting, types and techniques, equipment, fasteners, integral tanks, final assembly of aircraft, Jigs and Fixtures, stages of assembly, aircraft tooling concepts.								
<b>MODULE-IV</b>	<b>CONVENTIONAL AND UNCONVENTIONAL MACHINING PROCESSES</b>						<b>Classes: 09</b>	
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.								
<b>MODULE-V</b>	<b>AIRCRAFT COMPOSITES</b>						<b>Classes: 09</b>	
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; Materials used for aircraft components, Application of composite materials, Super alloys, indigenized alloys, emerging trends in aerospace materials.								

**Text Books:**

1. S. Kalpakjian, Steven R. Schmid, "Manufacturing Engineering and Technology", Addison Wesley 5<sup>th</sup> Edition, 1991.
2. S. C. Keshu, K. K Ganapathy, "Aircraft production technology and management", Interline Publishing House, Bangalore, 3<sup>rd</sup> Edition, 1993.
3. Douglas F. Horne, "Aircraft production technology", Cambridge University Press, 1<sup>st</sup> Edition, 1986.

**Reference Books:**

1. S. C. Keshu, K. K Ganapathy, "Air craft production techniques", Interline Publishing House, Bangalore, 3<sup>rd</sup> Edition, 1993.
2. R. K. Jain, "Production technology", Mc Graw Hill, 1<sup>st</sup> Edition, 2002.
3. O. P. Khanna, M. Lal, "Production technology", Dhanpat Rai Publications, 5<sup>th</sup> Edition, 1997.

**Web References:**

1. <https://nptel.ac.in/courses/112107145/>
2. <https://nptel.ac.in/courses/112105126/>

**E-Text Books:**

1. [https://books.google.co.in/books?id=6wFuW6wufTMC&redir\\_esc](https://books.google.co.in/books?id=6wFuW6wufTMC&redir_esc)
2. <https://royalmechanicalbuzz.blogspot.in/2015/04/manufacturing-engineering-by-kalpakjian.html>