

		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>15AS101</b>	<b>ELEMENTS OF AERONAUTICS</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>
	<b>Total contact hours - 30</b>				
	<b>Prerequisite</b>				
	<b>Nil</b>				
<b>PURPOSE</b>					
To introduce the students to the basic concepts of Aerospace, their power plants and the Mechanics of its flight					
<b>INSTRUCTIONAL OBJECTIVE</b>					
1.	To familiarize with the basics of aircraft structures, systems & instruments.				
2.	To give exposure to the power plants cased in Aircraft.				

### **UNIT I-AIRCRAFT CONFIGURATIONS (6 hours)**

Early flying vehicles – hot air balloons – heavier than air flying machines - Classification of flight vehicles, airplanes and Helicopters – Components of an airplane and their functions.

### **UNIT II-BASICS OF AERONAUTICS (6 hours)**

International Standard Atmosphere, Temperature, pressure and altitude relationships, lift, drag and moment. Basic characteristics of airfoils, NACA nomenclature, propagation of sound, Mach number, subsonic, transonic, supersonic, hypersonic flows.

### **UNIT III-AIRCRAFT STRUCTURES (6 hours)**

General types of construction, Monocoque and Semi monocoque - construction, Typical wing and fuselage Structures - Materials used in Aircraft.

### **UNIT IV-SYSTEMS AND INSTRUMENTS (6 hours)**

Conventional control, Powered controls, Basic instruments for flying, typical systems for control actuation.

### **UNIT V-POWER PLANTS USED IN AIRCRAFT (6 hours)**

Basic ideas about piston, turboprop and jet engines – comparative merits, Principle of operation of rocket, types of rocket and typical applications, Exploration into space.

**Total 30 hours**

**TEXT BOOKS**

1. Kermode,A.C.,Flightwithout Formulae, McGraw Hill,1987.
2. Shevell,R.S., Fundamentals of flights, Pearson education 2004.

**REFERENCES**

1. Anderson, J.D., Introduction to Flight, McGraw Hill,1995
2. McKinley, J.L. and R.D. Bent, Aircraft Power Plants, McGraw Hill1993.
3. Pallet, E.H.J. Aircraft Instruments & Principles, Pitman & Co 1933.

15AS101 ELEMENTS OF AERONAUTICS												
Course designed by		Department of Aerospace Engineering										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X						
2	Mapping of instructional objectives with student outcome	1-2				1-2						
3	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
						X						
4	Broad Area ( for courses under ‘P’ only)	Aerodynamics		Propulsion		Aircraft Structures		Aircraft Systems				
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5	Approval	23 <sup>rd</sup> meeting of Academic Council, May 2013										