COURSE CODE	COURSE TITLE	L	T	P	C
1152AE144	AIRCRAFT MATERIALS	3	0	0	3

a. Preamble:

This course provides an introduction about the different types of materials used for aerospace applications.

b. Prerequisite:

Engineering Materials

c. Links to other courses:

- High Temperature Materials

d. Course Educational Objectives :

Students undergoing this course are expected to

- To develop the basic knowledge of the students in aircraft materials

e. Course Outcomes : Upon the successful completion of the course, students will be ale

f. Mapping with COs and POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	M		H	H		M	M	H		
CO2	H		M		M	H		M	M	H		
CO3	H		M		M	H		M	M	H		
CO4	H		M		M	H		M	M	H		
CO5	H	M	H			H		H	H	H		

g. Course Contents

UNIT I MECHANICAL BEHAVIOUR OF MATERIALS

Linear and non linear elastic properties – Yielding, strain hardening, fracture, Bauchinger's effect –Knowledge of Various types of hardness testing machines- Notch effect testing and flaw detection of materials and components – creep and fatigue.

UNIT II LIGHT METAL ALLOYS & TITANIUM ALLOYS

Aluminum alloys, Heat treatment, High strength and high corrosion resistant alloys, Magnesium alloys and their properties. Titanium and its alloys- Application to Aerospace Vehicle of these alloys.

UNIT III AIRCRAFT STEELS

Classification of alloy steels, Effect of alloying elements, corrosion resistant steels, Heat treatment of steel alloys, Corrosion prevention methods.

UNIT IV HIGH STRENGTH, HEAT RESISTANT ALLOYS AND COMPOSITES

Nickel and cobalt base alloys, properties of Inconel, Monal and K-Monal, Nimonic and super alloys; Refractory materials; Composites their types, structure, multi-layering & hybrid materials, Stealth materials & Ceramics, Application to Aerospace vehicles.

UNIT V SELECTION OF AIRCRAFT MATERIALS

Importance & selection of materials for Aircraft & aerospace vehicle designs. Structures and Importance of temperature variations, for different parts of airplane.

Text Books

1. Titterton, G., " Aircraft Materials and Processes", Vedition, Pitman Publication Co., 1995.
2. F.C. Campbell, "Manufacturing technology for Aerospace structural materials" Elsevier, 2006

Reference Books:

1. Martin, J.W., "Engineering Materials, Their Properties, and Application", Wykendhan Publication. (London) Ltd., 1987.
2. Krishnadas Nair, C.G., " Handbook of Aircraft Materials", Interline Publishing, 1993.
3. Balaram Gupta, " Aerospace Materials", Vol.I, II and III, Chand & Company Ltd., New Delhi – 1996.
4. Raghavan.V., "Materials Science and Engineering", Prentice Hall of India, New Delhi, 1993.