

ITU  
FACULTY OF AERONAUTICS & ASTRONAUTICS  
COURSE SYLLABUS

Course Name	Code	Course Type	Regular Semester	Credit	ECTS	Lecture	Recitation	Lab
						(hour/week)		
<b>Aerospace Materials</b>	UCK353E	ED	5	3	5	3	0	0
<b>Department</b>	Aeronautical Engineering							
<b>Language</b>	English							
<b>Required/Elective</b>	Required							
<b>Content</b>	Introduction to aerospace materials. Metallic alloys for aerospace applications. Metal forming. Composite materials for aerospace applications. Production methods of composites. Smart materials. Nano Materials. High temperature materials for aerospace applications. Corrosion, wear and erosion. Fracture mechanics and failure. Fatigue mechanisms. Non-destructive evaluation methods.							
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To introduce the materials used for aerospace applications.</li> <li>• To introduce the manufacturing methods used for the aerospace materials.</li> <li>• To introduce the failure mechanisms.</li> <li>• To introduce the non destructive evaluation methods used for aerospace materials.</li> </ul>							
<b>Course Educational Outcomes</b>	<p>On completing this course students should,</p> <ol style="list-style-type: none"> <li>1. Know the metals and metal forming methods used for the aerospace applications. (a1,c1,e2,f1,h1,i1,k1)</li> <li>2. Know the composites and composite production methods used for the aerospace applications. (a1,c1,e2,f1,h1,i1,k1)</li> <li>3. Know advanced materials such as smart materials, nano materials, high temperature alloys used for aerospace applications. (a1,c1,e2,f1,h1,i1,j3,k1)</li> <li>4. Know the environmental effects on the aerospace materials. (a1,c2,e3,f1,h1,i1,j2,k2)</li> <li>5. Know failure and failure mechanisms on the aerospace materials. (a1,c2,e3,f1,h1,i1,k2)</li> <li>6. Know fatigue behavior of aerospace materials. (a1,c2,e3,f1,h1,i1,k2)</li> <li>7. Know non destructive evaluation of aerospace materials. (a1,c2,e3,f1,h1,i1,k2)</li> </ol>							
<b>Topics – Course Outline</b>								C.E.O.
	1. Introduction to aerospace materials							1
	2. Metallic alloys for aerospace applications							1
	3. Metal forming							1
	4. Composite materials for aerospace applications							2
	5. Production methods of composites							2
	6. Smart materials							3
	7. Nano Materials							3
	8. Nano Materials (continues), Review of past topics and evaluation							3
	9. High temperature materials for aerospace applications							3,4
	10. Corrosion, wear and erosion							4
	11. Fracture mechanics and failure							5
	12. Fracture mechanics and failure (continues)							5
	13. Fatigue mechanisms							6
	14. Non-destructive evaluation methods							7

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<b>Prerequisite</b>											
<b>Textbook</b>	Introduction to aerospace materials, A Mouritz and M Bannister, Woodhead Publishing Ltd. (to be published Autumn 2010)										
<b>Other References</b>	Aerospace Materials, ISBN 0 75030742 0, IOP Publishing, 2001 An Introduction to Composite Materials, D. Hull and T. W. Clyne, Cambridge Uni. Press, 1996. Composite Materials, K. K. Chawla, Springer Verlag, 1998. Advanced Composite Materials, L. A. Pilato and M. J. Michno, Springer-Verlag, 1994. Mechanics of Composite Materials, K. K. Autar, CRC Press, 1997.										
<b>Laboratory Work</b>											
<b>Computer Usage</b>											
<b>Others</b>											
<b>Course Evaluation Method</b>	Type	Number					Ratio %				
	Midterm exam	1					25				
	Quiz										
	Homework	5					25				
	Project										
	Term Project										
	Laboratory										
	Other										
	Final Exam					1					50
<b>Outcomes</b>	a	b	c	d	e	f	g	h	i	j	k
	1	0	2	0	3	1	0	1	1	1	0

Course Instructor and/or Faculty Member Responsible for the Data

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