



Course Specifications

Program(s) on which this course is given:	Aerospace Engineering
Department offering the program:	Department of Aerospace Engineering
Department offering the course:	Department of Aerospace Engineering
Academic Level:	Ph.D.
Date	March 23 2015
Semester (based on final exam timing)	<input type="checkbox"/> Fall <input type="checkbox"/> Spring

A- Basic Information

1. Title:	Advanced Composite Materials		Code:	AER 735				
2. Units/Credit hours per week:	Lectures	45	Tutorial	15	Practical	3	Total	45

B- Professional Information

1. Course description:	This course introduces the advanced nano composite and the high temperature composites, their production technology, mathematical modeling and theory of computing structural stress and strain with application to engineering structures.
2. Intended Learning Outcomes of Course (ILOs):	a) Knowledge and Understanding
	To know the reasons for the need for advanced composites
	To understand basic advanced materials production technology
	b) Intellectual Skills
	Use principles and concepts for analysis of advanced composites
	To learn the methods to predict the composite materials response to loads and environment
	c) Professional and Practical Skills
	Application of composites to engineering components
	Design of advanced composites
d) General and Transferable Skills	
Solve advanced composite problems	
Analyze results and reach conclusion	
Write reports	

3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Types and needs of advanced composites		3	
Advanced material production technology		3	
Analysis of high temperature composites and Nano composites		9	9
Environmental degradation of high temperature composites and Nano composites		3	
Design applications of advanced composites		6	6
Repair o advanced composites		3	3

4. Teaching and Learning Methods	Lectures (27)	Practical Training/ Laboratory (15)	Seminar/Workshop (3)
	Class Activity (4)	Case Study (1)	Projects (1)
	E-learning (2)	Assignments /Homework (5)	Other:
5. Student Assessment Methods			
<ul style="list-style-type: none"> Assessment Schedule 		Week	
-Assessment 1;Class test		4,5,6	
-Assessment 2; Project Assignment		7	
-Assessment 3; Presentations		10	
-Assessment 3; Midterm Exam		9	
-Assessment 4; Final Exam		16	
<ul style="list-style-type: none"> Weighting of Assessments 			
-Mid-Term Examination		20	
-Final-term Examination		40	
-Project		20	
-Class Test		15	
-Presentation		5	
-Total		100	
6. List of References			
Polymer graphene nano composites, Editor: Vikas Mittal ,Print ISBN: 978-1-84973-567-4			
Structural nano composites , Editor: Njuguna, James (Ed.) , eBook ISBN 978-3-642-40322-4			
High Temperature Mechanical Behaviour of Ceramic Composites, Editor: Karl Jakus, Rhanti Nair ISBN-13: 978-0750693998			
High Temperature Performance of Polymer Composites, Editor: Yu Bain, Thomas Keller, ISBN-13: 978-3527327935			
7. Facilities Requeired for Teaching and Learning			
.advanced materials lab			
Course Coordinator:	Nader M. Abuelfoutouh		
Head of Department:	Ayman H. Kassem		

