



Меѓународен Универзитет Визион - International Vision
UniversityUniversitetiNdërkombëtarVizion - UluslararasıVizyonÜniversitesi

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SYLLABUS

COURSE NAME	COURSE CODE	SEMESTER	COURSE LOAD	ECTS
COMPOSITE MATERIALS	CIV-4003	7	180	6

Prerequisite(s)	None
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Course Language	Macedonian, Turkish, English
Course Type	Required
Course Level	First Cycle
Course Lecturer	
Course Assistants	
Classroom	
Extra Curricular Office Hours and Location	Meeting: Consultancy:

Course Objectives	The purpose of the subject is 1. To learn composite materials. 2. To solve problems in the mechanics of composite materials.
Course Learning Outcomes	Students who successfully pass this course: <ul style="list-style-type: none"> • Should be able to define the properties of composite manufacturing technologies, fiber, and matrix materials used in composites. • Should calculate the elastic properties of both long and short fiber composites, and take into account the properties of the components. • Should be able to make the coordinate transformation of stress, strain, and stiffness values using matrix algebra. • Should understand the basic rules of elasticity concerning isotropic and anisotropic material behavior. • To be able to analyze the bending of the laminated composite plate, the properties of the laminated plate from the layer properties, and the permanent stresses due to aging and moisture. • To be able to predict the damage resistance of laminated composite plate. • To learn about the fracture of composites and their effects on the environment.

	<ul style="list-style-type: none">• To learn the latest developments in composites, metal, and ceramic matrix composites.• To be able to use the ideas developed in the analysis of composites used in aircraft design.
Course Contents	Fibers: glass, carbon, ceramic, organic. Matrix materials: polymers, metal, ceramics, carbon. Composite materials: polymer matrix composites, ceramic matrix composites, carbon/carbon composites. Mechanics of composite materials: density, coefficient of elasticity, coefficient of thermal expansion. Transfer of tensile loading from fiber to a matrix. Mechanics of composite materials. Mechanics of layered structures.

WEEKLY SUBJECTS AND RELATED PREPARATION STUDIES

Week	Subjects	Related Preparation
1	Introduction to composite materials and usage areas of composite materials	Related Chapters of Course Sources
2	Fibers	Related Chapters of Course Sources
3	Matrices, interfaces	Related Chapters of Course Sources
4	Composites	Related Chapters of Course Sources
5	Anisotropic elasticity	Related Chapters of Course Sources
6	Micromechanics of composites	Related Chapters of Course Sources
7	Layer theory	Related Chapters of Course Sources
8	Midterm exam 1	
9	Layer theory	Related Chapters of Course Sources
10	Layer theory	Related Chapters of Course Sources
11	Layered beams I: bending and strength	Related Chapters of Course Sources
12	Laminated beams II: shear and buckling	Related Chapters of Course Sources
13	Layered plaques	Related Chapters of Course Sources
14	Environmental effects and durability, Damage tolerance, and airworthiness of fibrous composite layers	Related Chapters of Course Sources
15	Manufacturing methods: fiber winding, open and pressure die technology	Related Chapters of Course Sources
16	Midterm exam 2	

ECTS / WORKLOAD TABLE

Presentation / Seminar			
Hours for off-the-classroom study (Pre-study, practice)	14	3	42
Midterm Exam	1	12	12
Final examination	1	14	14
Total Work Load			
ECTS		6	

GENERAL PRINCIPLE RELATED TO COURSE

Dear students,

In order to be included, learn and achieve full success that you deserve in the courses you need to come well prepared by reading the basic and secondary textbooks. We are expecting from you carefully to obey to the course hours, not to interrupt the lessons unless is very indispensable, to be an active participant on the courses, easily to communicate with the other professor and classmates, and to be interactive by participating to the class discussions. In case of unethical behavior both in courses or on exams, will be acting in framework of the relevant regulations. The attendance of the students will be checked in the beginning, in the middle or at the end of the lessons. Throughout the semester the students who attend to all lectures will be given 15 activity-attendance points in addition to their exam grades.

SOURCES**COMPULSORY LITERATURE**

No	Name of the book	Author's Name, Publishing House, Publication Year
1	Mechanics of Composite Materials	Autar, K. Kaw, 1997, Mechanics of Composite Materials, CRC Press.

YARDIMCI KAYNAKLAR

No	Kitabın İsmi	Yazarın İsmi, Yayın Evi, Yayın Yılı
1	Composite Materials for Aircraft	B. C. Hoskin and A. A. Baker, 1989, Composite Materials for Aircraft
2	Structures, AIAA Education Series	Structures, AIAA Education Series. Krishan K. Chawla, 1998,
3	Composite Materials	Composite Materials, Springer-Verlag. Middleton, D., 1990, Composite
4	Materials in Aircraft Structures	Materials in Aircraft Structures, Burnt Hill. D. Hull and T. W. Clyne, 1996, An Introduction to Composite Materials, Cambridge University Press.

EVALUATION SYSTEM

Underlying the Assessment Studies	NUMBER	PERCENTAGE OF GRADE
Attendance/Participation	15	%10
Project / Event	1	%20
Mid-Term Exam	1	%35
Final Exam	1	%35
TOTAL	17	%100

ETHICAL CODE OF THE UNIVERSITY

In case of the students are cheating or attempt to cheat on exams, and in the case of not to reference the sources used in seminar studies, assignments, projects and presentations, in accordance to the legislations of the Ministry of Education and Science of Republic of Macedonia and International Vision University, will be applied the relevant disciplinary rules. International Vision University students are expected never to attempt to this kind of behavior.