Study program / course: Mechanical Engineering	
Type and level of study: Bachelor academic studies	
Course: Fibre Reinforced Materials	
Lecturers: Dragan I. Milosavljevic	
Status of course: Elective for module M$_5$, VI semester	
Number of ECTS: 6	
Preconditions: None	

The objective of course

Understanding theoretical basics of role of constituents, such as matrix and fibres, and develop a strong understanding of the role of constituents in overall response of composite lamina (micromechanics), develop a strong understanding of how a set of lamina with different orientations affect the overall laminate properties and response (macro-mechanics).

The outcome of course

Students will, upon passing exams, will be able to understand technical subjects that follow, and also to have base for further study of composite materials.

Syllabus

Theoretical study: The aim of theoretical study is to make students capable to prove theorems and formulas necessary for analysis of structures made of fibre reinforced materials. Lectures are given with strong usage of contemporary mathematical tools with active students participations. Subject has both micromechanics and macro-mechanics approach. Composite layer, as base for creation of desired structure, may be either one-directional or two-directional. The basic behavior of material, in respect to strength of materials, is studied in details.

Practical classes

Practical solutions of chosen examples will be presented by lecturer, and students are asked to solve two given examples by themselves, to present and interpret those personally.

Recommended reading

[1]   Tsai S.W, Hahn H.T, Introduction to Composite materials, Technomic Pub., 1980.
[2]   Powell P.C., Engineering with Fibre - Polymer Laminates, Chapman & Hall, 1994.

The number of hours of active teaching:				Other classes:
Theory: 3	Practical classes: 1.6	Other forms of teaching: 0.4	Research study: 0	1

Methods of teaching

Teaching is conducted through lectures, practical classes and independent work of students. Within lectures students receive basic theoretical knowledge. In practical classes students receive practical knowledge and skill for using mathematical tools from study of FRM. Students create independent tasks which include and integrate knowledge for usage of certain tools.

Evaluation of knowledge			
Pre-final exam obligations	**points**	**Final exam**	**points**
Activities during the classes:	**6**		**42**
Practical classes/ Home works:			
Colloquiums(s)/ Tests:	**44**		
Seminar(s) :	**8**		