

Faculty of Civil Engineering / CONSTRUCTION / MODELLING IN STRUCTURAL DESIGN

Course:	MODELLING IN STRUCTURAL DESIGN			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
11897	Mandatory	2	5	2+0+2
Programs	CONSTRUCTION			
Prerequisites	No prerequisites			
Aims	Training for independent modeling of building structures in available software packages.			
Learning outcomes	After passing this exam, the student will be able to: 1. Define a design construction model 2. Generate an appropriate numerical model using available software, 3. Interpret and control the obtained results 4. Implement the calculation and results in the appropriate documentation.			
Lecturer / Teaching assistant	Prof. dr Milivoje Rogač, Mr Ivana Drobnjak			
Methodology	Lectures, exercises, colloquiums.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Learning about the available software packages			
I week exercises	Learning about the available software packages			
II week lectures	Types of finite elements (1D, 2D, 3D)			
II week exercises	Types of implemented finite elements (1D, 2D, 3D)			
III week lectures	2D frame modeling, importing geometry of elements, materials and loads. Analysis of results			
III week exercises	2D frame modeling, importing geometry data of elements, materials and loads. Analysis of results			
IV week lectures	Shear walls modeling, importing geometry data, materials and loads. Analysis of results			
IV week exercises	Shear walls modeling, importing geometry data, materials and loads. Analysis of results			
V week lectures	Modeling of 3D structures, importing data for geometry, materials and loads. Analysis of results			
V week exercises	Modeling of 3D structures, importing data for geometry, materials and loads. Analysis of results			
VI week lectures	Modeling of more complex 3D constructions (mixed system). Analysis of results			
VI week exercises	Modeling of more complex 3D constructions (mixed system). Analysis of results			
VII week lectures	Modeling of more complex 3D constructions (shells). Analysis of results			
VII week exercises	Modeling of more complex 3D constructions (shells). Analysis of results			
VIII week lectures	FIRST COLLOQUIUM			
VIII week exercises	FIRST COLLOQUIUM			
IX week lectures	Moving load. Influence lines. Envelopes of influence.			
IX week exercises	Moving load. Influence lines. Envelopes of influence.			
X week lectures	Modal analysis (periods, frequencies, forms of oscillation)			
X week exercises	Modal analysis (periods, frequencies, forms of oscillation)			
XI week lectures	Dynamic load. Forced harmonic force.			
XI week exercises	Dynamic load. Forced harmonic force.			
XII week lectures	Earthquake effect on structures.			
XII week exercises	Earthquake effect on structures.			
XIII week lectures	Basis of dimensioning of steel and concrete structures.			
XIII week exercises	Basis of dimensioning of steel and concrete structures.			
XIV week lectures	Creating an output file with results			
XIV week exercises	Creating an output file with results			
XV week lectures	CORRECTION COLLOQUIUM			

XV week exercises		CORRECTION COLLOQUIUM				
Student workload		Weekly: 5 credits x 40/30 = 6.67 hours				
Per week		Per semester				
5 credits x 40/30=6 hours and 40 minuts 2 sat(a) theoretical classes 2 sat(a) practical classes 0 excercises 2 hour(s) i 40 minuts of independent work, including consultations		Classes and final exam: 6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts Total workload for the subject: 5 x 30=150 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 30 hour(s) i 0 minuts Workload structure: 106 hour(s) i 40 minuts (courses), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)				
Student obligations		Attending lectures and exercises, passing the colloquium				
Consultations						
Literature		Basic literature: 1. Lecture script 2. Instructions for using the available software				
Examination methods		Knowledge is checked continuously during the semester and at the final exam. A student can earn a maximum of 100 points during the semester. The following are evaluated: - Class attendance: up to 4 (for each absence from class, 1 point is deducted) - Colloquium: up to 48 - Final exam: up to 48 A minimum sufficient number of points and a maximum number of points are given. The colloquium and the final exam are done in writing. A passing grade is obtained if 50 points are collected and if at least 24 points are obtained in both the colloquium and the final exam.				
Special remarks						
Comment		Additional information about the subject can be obtained from the subject teacher, associate, head of the study program and vice dean for teaching.				
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points