Faculty of Civil Engineering / CIVIL ENGINEERING / TIMBER STRUCTURES

Course:	TIMBER STRUCTURES			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
197	Mandatory	5	5	2+1+1
Programs	CIVIL ENGINEERING			
Prerequisites	Building materials, Strength of materials I and II			
Aims	Getting basic knowledge in timber structures design			
Learning outcomes	1. Know basic kinds and characteristics of timber as a building material 2. Know principles and specific issues of application, design, construction and protection of timber structures 3. Calculate carrying capacity and serviceability, as well as design timber elements in common structures, for the case of elementarz stress states. Know stability problems of timber structures 4. Know connections and fasteners in timber structures. Design elementary types of connections in common timber structures 5. Design simple solid timber structures			
Lecturer / Teaching assistant	Assoc. Prof. Biljana Šćepanović , Dr-Ing - teacher Mladen Muhadinović, MSc; Petar Subotić, MSc - assistants			
Methodology	Lectures, exercises, laboratory exercises, consultations, semester project			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction- General about timber structures, application domains, , the most important objects, historical development, advantages and disadvantages of timber structure. Timber as material of structures in civil engineering (structure, kinds, defects, protection, timber and fire, glue laminated timber).			
I week exercises	Introduction- General about timber structures, application domains, , the most important objects, historical development, advantages and disadvantages of timber structure. Timber as material of structures in civil engineering (structure, kinds, defects, protection, timber and fire, glue laminated timber).			
II week lectures	Timber properties (aesthetic, physical, rheological, mechanical). Basis of timber structures calculation (loads; carrying capacity, stability and serviceability; design methods).			
II week exercises	Timber properties (aesthetic, physical, rheological, mechanical). Basis of timber structures calculation (loads; carrying capacity, stability and serviceability; design methods).			
III week lectures	Timber structures calculation/design - carrying capacity, stress states(centric tension and compression, bending, shear, torsion, eccentric tension and compression). Semester project - Task 1			
III week exercises	Timber structures calculation/design - carrying capacity, stress states(centric tension and compression, bending, shear, torsion, eccentric tension and compression). Semester project - Task 1			
IV week lectures	Timber structures calculation/design - carrying capacity, stress states(centric tension and compression, bending, shear, torsion, eccentric tension and compression). Semester project - Task 2			
IV week exercises	Timber structures calculation/design - carrying capacity, stress states(centric tension and compression, bending, shear, torsion, eccentric tension and compression). Semester project - Task 2			
V week lectures	Tapered girders. Semester project - Task 3			
V week exercises	Tapered girders. Semester project - Task 3			
VI week lectures	Timber structures calculation/design - serviceability, deformations. Semester project - Task 4			
VI week exercises	Timber structures calculation/design - serviceability, deformations. Semester project - Task 4			
VII week lectures	Curved and pitched girders			
VII week exercises	Curved and pitched girders			
VIII week lectures	Connectors and fasteners. Connections and splices			
VIII week exercises	Connectors and fasteners. Connections and splices			
IX week lectures	Classic timber structures. Classic timber roofs and truss girders.			
IX week exercises	Classic timber structures. Classic timber roofs and truss girders.			
X week lectures	Girders made of timber and wood based plates (thin webbed and thin flanged girders).			
X week exercises	Girders made of timber and wood based plates (thin webbed and thin flanged girders).			

XI week lectures	Formworks and scaffoldings.
XI week exercises	Formworks and scaffoldings.
XII week lectures	In situ teaching - excursion to the construction site or existing objects.
XII week exercises	In situ teaching - excursion to the construction site or existing objects.
XIII week lectures	Timber structures design and construction. semester project - Task 5
XIII week exercises	Timber structures design and construction. semester project - Task 5
XIV week lectures	Semester project presentation and defence.
XIV week exercises	Semester project presentation and defence.
XV week lectures	Semester wrap - up and final preparation for the examination.
XV week exercises	Semester wrap - up and final preparation for the examination.
Student workload	Teaching and final exam: (6.67 hours)x16 = 106.67 hours Necessary preparations before semester (administration, enrollment etc) 2x(6.67 hours) = 13.33 hours Total load for the course: 5x30 = 150 hours. Additional work for exam preparation in the additional exam session, including passing of correctional exam between 0 and 30 hours (remaining time from the previous issues to the final load for the course of 150 hours) Load structure: 106.67 hours (teaching) + 13.33 hours (preparation) + 30 hours (additional work)

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 2 sat(a) theoretical classes 1 sat(a) practical classes 1 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 (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	
Consultations	
Literature	Basic literature 1. Zakić B.: Uvod u mehaniku drveta, FTN NS i IMS BG, Beograd, 1985. 2. Gojković M.: Oplate i skele, GF BG i Naučna knjiga, Beograd, 1988. 3. Ilić S.: Klasični drveni krovovi, građevinska knjiga, Beograd, 1989 4. Gojković M., Stojić D.: Drvene konstrukcije, GF BG i Grosknjiga, Beograd, 1996. 5. Goldstein W.E.: Timber Construction for Architects and Builders, McGrow-Hill, USA, 1999. Additional literature: 6. Gojković M. i dr.: Drvene konstrukcije - rešeni primeri iz teorije i prakse, GF BG i Grosknjiga, Beograd, 1989. 7. JUS standards 8. MEST EN standards
Examination methods	Semester project 22.5 - 45 (min positively marked semester project = 22.5 points) Final exam 27.5 - 55 (min positively marked final exam = 27.5 points) Semester project should be completed in order to be marked. It consists of oral and written part. Final exam is in written form. Both theory and numerical part should be done > 50% Following grading system is applied: A for > 90 points B for 80 < points < 90 C for 70 < points < 80 D for 60 < points < 70 E for 50 < points < 60 F for < 50 points. Positive grade is obtained for min 50 points. F = failed
Special remarks	
Comment	Additional information on course may be obtained from course teacher , assistant, head of the study programme 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