Course Name: TIMBER STRUCTURES

Course Code	Course Status	Semester	ECTS Credits	Number of classes
	Compulsory	V	5	2P+1V+1L

Study programmes: Undergraduate academic studies - study programme Civil Engineering; 6 semesters / 180 ECTS credits.

Conditioned by other courses: Building materials, Strength of materials I & II.

Aims of the course: Getting basic knowledge in timber structures design.

Learning outcomes: After passing this exam, student will be able to: 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 cases of elementary stress states. Know stability problems of timber structures. 4. Know connectors and fasteners in timber structures. Design elementary types of connections in common timber structures. 5. Design simple solid timber structures.

Teacher and assistant: Assoc.Prof. Biljana Šćepanović, Dr-Ing. – teacher
Mladen Muhadinović, MSc; Petar Subotić, MSc – assistants

Methods of teaching and learning: Lectures, exercises, laboratory exercises, consultations, semester project.

Course content:

I teaching week	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 teaching week	Timber properties (aesthetic, physical, rheological, mechanical). Basis of timber structures calculation (loads; carrying capacity, stability and serviceability; design methods).
III teaching week	Timber structures calculation/design – carrying capacity, stress states (centric tension and compression, bending, shear, torsion, eccentric tension and compression). Semester project – task 1.
IV teaching week	Timber structures calculation/design – carrying capacity, stress states (centric tension and compression, bending, shear, torsion, eccentric tension and compression). Semester project – task 2.
V teaching week	Tapered girders. Semester project – task 3.
VI teaching week	Timber structures calculation/design – serviceability, deformations. Semester project – task 4.
VII teaching week	Curved and pitched girders.
VIII teaching week	Connectors and fasteners. Connections and splices.
IX teaching week	Classic timber structures. Classic timber roofs and truss girders.
X teaching week	Girders made of timber and wood-based plates (thin-webbed and thin-flanged girders).
XI teaching week	Formworks and scaffoldings.
XII teaching week	In situ teaching – excursion to the construction site or existing objects.
XIII teaching week	Timber structures design and construction. Semester project – task 5.
XIV teaching week	Semester project presentation and defence.
XV teaching week	Semester wrap-up and final preparation for the examination.

Student's obligations: Attending of lectures and exercises, elaboration of semester project.

STUDENTS LOAD

Per week	In semester
5 credits x 40/30 = 6.67 hours Structure: 2 hours lectures 2 hours exercises 2.67 hours individual work, including consultations	Teaching and final exam: (6.67 hours) x 16 = 106.67 hours Necessary preparations before semester (administration, enrolment etc) 2 x (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)

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

Examining system and grading:

Examining is continuous during the semester and in the final exam.
Maximum number of points in semester: 100.
The structure of examination and points is as follows:

- 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 part 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 notes for the course:

Data prepared by teacher: Assoc.Prof. Biljana Šćepanović, Dr-Ing.

Note: Additional information on course may be obtained from course teacher, assistant, head of the study programme and vice-dean for teaching.