Course title: STATICS OF STRUCTURES II

Course code	*Course status*	*Semester*	*Number of ECTS credits*	*Number of classes*
	Mandatory	*VI*	*7*	*3P+1V+2L*

Study programs for which it is organized: Bachelor studies – Study program Civil engineering, Module 1 Structures and Module 2 Infrastructure, duration 6 semesters and 180 ECTS credits.

Conditionality to other subjects: Strength of materials I, Strength of materials II, Mathematics II

Course study objectives: Acquiring knowledge in the field of statics of line structures in plane

Learning outcomes: After passing this exam the student will be able to:
1. Understand the basics of linear theory of elasticity of linear girders and basic procedures for determining static determination and kinematic stability,
2. Understand and applies the analytical / classical method of deformations for the calculation of forces and displacements in statically indeterminate structures in plane,
3. Understand the basic concepts in matrix analysis,
4. Apply matrix methods for calculating the internal forces (forces and displacements) of statically determined and statically indeterminate structures,
5. Implement the SAP software for calculation of internal forces for structures in plane.

Name and surname of professor and teaching assistant: ***Dr Marina Rakočević, Vasilije Bojović***

Teaching and learning methods: Lectures, practise, elaborate, consultations, additional classes and consultations before the final exam, colloquia, final exams.

Course content:

1st week of course	Basic equations of technical theory of a mamber in a plane. Static indeterminacy, kinematic stability, basic principles.
2nd week of course	Deformation method: deformation indeterminacy, displacement-force relations, conditional equations.
3rd week of course	Internal forces, displacements and influential lines in the deformation method. Symmetrical structures.
4th week of course	Matrix analysis. Assumptions, unknown variables, force-displacement relations (stiffness and flexibility matrices), equivalent node load.
5th week of course	*COLLOQUIUM I*
6th week of course	Matrix analysis of member. Direct procedure of forming stiffness matrices and equivalent load vectors.
7th week of course	The process of forming stiffness matrices using the base stiffness matrix.
8th week of course	Torsion. Variation procedure for determination of stiffness matrices and load vectors.
9th week of course	Shear deformation. Transformation of stiffness matrices and load vectors in the plane.
10th week of course	Line structures in plane. Equilibrium equations, kinematic matrix, boundary conditions.
11th week of course	Code number procedure. Determination of displacements, reactions and internal forces.
12th week of course	Orthogonal frames. Continuous girders. Symmetrical frames.
13th week of course	Spatial structures. Grid spatial structures.
14th week of course	SAP software package.
15th week of course	*COLLOQUIUM II*

Student obligations during course: Attendance at lectures and practises, making elaborate, taking a colloquium and final exam.

STUDENT WORKINGLOAD

Weekly	**During the semester**
7 credits x40/30=9 hours and 20 min **Structure:** **3** hours of lectures **3** hours of practise **3** hours and **20** minutes individual work including consultations	**Lectures and final exam**: 16x (9 hours and 20 min)**=149 hours i 20 min** **Necessary preparations before the beginning of the semester** (administration, enrollment, certification): 2x (9 hours and 20 min)=**18 hours and 40 min** **Total workingload for course: 7x30=210 hours** **Additional work** for exam preparation in the remedial exam period, including taking the remedial exam from 0 to 42 hours (remaining time from the first two items to the total workload for the course 135 hours) **Workingload structure:** 149 h and 20 min (lect.)+18 h and 40 min (prep.) + 42 h (additional work)=210h

Literature: M.Sekulović: Matrična analiza konstrukcija, Građ.knjiga,Beograd 1992; M.Đurić,P.Jovanović: Teorija okvirnih konstrukcija, Građ.knjiga,Beograd 1972; M.Sekulović,M.Petronijević, Statika konstrukcija 2- zbirka ispitnih zadataka, Naučna knjiga,Beograd 1989.; Other literature in the field of statics of structures from foreign publishers

Forms of exams and grading:
The knowledge test is performed continuously during the semester and at the final exam. The maximum student can earn 50 points during the semester. The following is evaluated:

- Elaborate from 4,0 to 10,0 points
- Colloquia 2x (from 9,0 to 20,0) or 2x(20,2 to 45,0) points
- Final exam from 22,5 to 50,0 points

Elaborate: The student is obliged to regularly work elaborate tasks according to the established program.
At the colloquia, the theoretical part of the exam is taken orally / in writing, with the stated minimum and maximum number of points.
At the final exam, tasks are taken in writing with the stated minimum and maximum number of points.
A passing grade is obtained when at least 50 points are earned.

Special notes for the course:

Name and surname of the professor who prepared the data: ***Dr Marina Rakočević***

Note: Additional information about the subject can be obtained from the course lecturer, teaching assistant, head of the study program and vice dean.