Theory of Girders

Code: MK3MEC5S4SS17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 3th year, 5th semester

Its prerequisite: Strength of Material

Further courses are built on it: Yes

Number of teaching hours/week (lecture + practice): 0+4

Topics:

Introduction. Force and displacement influence lines of statically determinate structures. Maximal internal forces and the diagrams of maximal internal forces. Solution of statically indeterminate plane structures by the force method. Force influence lines of statically indeterminate structures with the force method. Solution of statically indeterminate plane structures by the displacement method. The Cross method. The mechanical displacement method. The General matrix equation of planar rod structures.

Literature:

Compulsory:

- Aslan Kassimali: Structural Analysis (ISBN- 13: 978-1133943891)

Recommended:

- Budynas: Advanced Strength and Applied Stress Analysis (ISBN-13: 978-0070089853)
- Popov: Mechanics of materials (ISBN-13: 978-0135713563)

Schedule

1st week Registration week	
2nd week **Practice:** Force influence lines of statically determinate structures with the Theorem of virtual displacements	**3rd week:** **Practice:** Displacement influence lines of statically determinate structures with the Theorem of virtual forces
4th week: **Practice:** Maximal internal forces and the diagrams of maximal internal forces	**5th week:** **Practice:** Solution of statically indeterminate plane structures by the force method
6th week: **Practice:** Force influence lines of statically indeterminate structures with the force method **Mid-term test**	**7th week:** **Practice:** Trip.
8th week: 1st drawing week	
9th week: **Practice:** Solution of statically indeterminate plane structures by the displacement method	**10th week:** **Practice:** The Cross method
11th week:	**12th week:**

Practice: The mechanical displacement method	**Practice:** The General matrix equation of planar rod structures
13th week:	**14th week:**
Practice: Practicing the displacement method and revision	**Practice:** **End-term test**
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at **practice** is compulsory. Students must attend the practices and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't make up a practice with another group. Attendance on practice will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Students are required to bring a calculator to each practice class. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct doesn't meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class.

During the semester there are two tests: the mid-term test in the 6th week and the end-term test in the 14th week. If the score of any test is below 30 from 50 points, a student once can retake the test in both topics.

Tests:

Test 1:		Maximum:	**50 points**
Test 2:		Maximum:	**50 points**
	Summa: **100 points**	Minimum	**60 points**

B, for a grade:

The mid-semester grade is based on the points of the tests.

A grade is given according to the following table:

Score	Grade
0-59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)