**Theory of Girders I.**

**Code: MFTST31SS3-EN**

**ECTS Credit Points: 3**

**Evaluation: ESE**

Year, Semester: 3rd year/1st semester

Number of teaching hours/week:

Lecture: **1**

Practice: **2**

**Prerequisites:** Mechanics III. (Dynamics): MFMEC33S05-EN

**Topics**:

Force and displacement influence lines of statically determinate structures. Displacements by work theorems. Maximal internal forces of cross sections. Diagrams of maximal internal forces. Solution of statically indeterminate plane structures by the force method, dead load, manual solution. Frames, trusses, strengthened structures and continuous beams. Solution of statically indeterminate plane structures by the displacement method, dead load, manual solution. The moment distribution method. Orthogonal plane frames, continuous beams.

**Literature:**

Structural Analysis : Aslan Kassimali (2014) ISBN:1133943896

**Schedule**

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| **1st week:**  **Lecture:** Internal forces for statically determinate structures.  **Practice:** Internal forces for statically determinate structures.  **2nd week:**  **Lecture:** Work theorems – Principles of virtual displacements and forces  **Practice:** Work theorems  **3rd week:**  **Lecture**: Displacements by work theorems.  **Practice:** Displacements by work theorems.  **4th week:**  **Lecture:** Calculation of statically indeterminate structures by the force method, principles, fix loads  **Practice**: Force methods.  **5th week:**  **Lecture:** Application of the force method for grids  **Practice:** Application of the force method for grids  **6th week:**  **Lecture:** Calculation of planar frames by the displacement method, principles  **Practice:** Rating practice | **7th week:**  **Lecture: Drawing week: -**  **Practice:** **Drawing week:-**  **8th week:**  **Lecture: Mid-term test.**  **Practice:** Calculation of planar frames by the displacement method, principles  **9th week:**  **Lecture:** Application of the displacement method for planar frames  **Practice:** Application of the displacement method for planar frames  **10th week:**  **Lecture:** Calculation of planar frames by the moment distribution method  **Practice:** Calculation of planar frames by the moment distribution method  **11th week:**  **Lecture:** A cross table for  moment distribution.  **Practice:** A cross table for  moment distribution.  **12th week:**  **Lecture:** Matrix analysis of planar frames  **Practice:** Matrix analysis of planar frames |
| **13th week:**  **Lecture:** Summary  **Practice:** Rating practice  **14th week:**  **Lecture: Mid-term test.**  **Practice:** Summary of the practice. | **15th week:**  **Lecture: Drawing week: -**  **Practice:** **Drawing week: -** |

**Requirements**

**A, for a signature:**

Attendance at **lectures** is recommended, but not compulsory.

Participation at **practice classes** is compulsory. Students must attend the practice classes 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 at 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 every class. If a student’s behavior 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.

Students have to **submit all the tasks** as scheduled minimum at a sufficient level.

During the semester there are two tests: test 1 in the 8th week and the test 2 in the 15th week. Students have to reach the minimum point level on each test.

If the score of any test is below 15 from 30 points, the student once can take a retake test in both topics.

**B, for a grade:**

The course ends in **examination grade**. Based on the points of the tasks, tests and the exam.

Based on points earned during the semester, the 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)