**Bridges & Structures**

**Code: MFMUT31S04-EN**

**ECTS Credit Points: 4**

**Evaluation: exam**

Year, Semester: 4th year/1st semester

Number of teaching hours/week:

Lecture: **2**

Practice: **2**

**Prerequisites:** Geotechnics III.: MFGTH33S04-EN

**Topics**:

The series of lectures are based on the relevant techniques of building bridges and other structures.

It outlines the planning and construction of steel, concrete, prestressed, composite and timber bridges, as well as the state-of-art techniques of building bridges. Finally, it treats reinforced concrete structures such as water towers, reservoirs and bunkers.

Literature:

M. J. Ryall, G. A. R. Parke, J. E. Harding (2000): *The* *Manual of Bridge Engineering*, London: Thomas Telford;

H. G. Tyrrell (2008): *History of Bridge Engineering,* Stubbe Press.

**Schedule**

|  |  |
| --- | --- |
| **1st week:**  **Lecture:** Programme  The history of bridges  The classification of bridges  **Practice:** Standards.  **2nd week:**  **Lecture:** Requirementsand preliminary works.  **Practice:** Foundations, substructures and equipment; dilatations.  **3rd week:**  **Lecture:** The structures of steel bridges. Steel girder bridges.  **Practice**: The building techniques of steel bridges.  **4th week:**  **Lecture:** Steel frames, arches and suspension bridges.  **Practice:** Orthotropic plates.  **5th week:**  **Lecture:** The structures of concrete bridges.  **Practice:** The building techniques of concrete bridges.  **6th week:**  **Lecture:** Concrete girder bridges; concrete frames and arch bridges.  **Practice:** Concrete slab bridges. | **7th week:**  **Lecture:** Prestressing techniques. Precast pretensioned girder bridges.  **Practice:** Concrete box girders.  **8th week:**  **Lecture:** Structures of cable-stayed bridges.  **Practice:** Building techniques of cable-stayed bridges  **9th week:**  **Lecture:** Composite bridges.  **Practice:** Timber bridges.  **10th week:**  **Lecture:** Test loading, monitoring and maintenance.  **Practice:** Strengthening techniques.  **11th week:**  **End-term test**  **Lecture:** Reservoirs, bunkers, water-towers.  **Practice:** **- - -**  **12th week:**  **Lecture:** Cases and curiosities  **Practice:** **- - -** |

**Requirements**

**A, for a signature:**

Attendance and participation at **lectures** and **practice classes** is compulsory. Students must attend them 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. Attendance will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certificate needs to be presented.

During the semester there is one end-term test. To pass it students have to achieve a minimum (50%) level.

**B, for a grade:**

The course ends in an **exam (ESE)**. Based on the result of the end-term test (30%) and the written exam (70%):

Score Grade

0-50 fail (1)

50-62 pass (2)

63-74 satisfactory (3)

75-85 good (4)

85-100 excellent (5)

If the score of the test is below 50, students have one chance to write a retake exam.