**Engineering Timber Structures**

**Code: MFMFS31SM3-EN**

**ECTS Credit Points: 3**

**Evaluation: mid-semester grade**

Year, Semester: 4th year/1st semester

Number of teaching hours/week:

Lecture: **2**

Practice: **0**

**Prerequisites:** Timber & Masonry Structures MFFFS31S03-EN

**Topics**:

Timber as a structural material: strength and elastic properties. Engineering wood products. Design of members subjected to flexure. Deign of members and walls subjected to axial or combined axial and flexural actions. Design of glued laminated members. Design of composite timber and wood-based sections. Design of built-up columns. Design of stability bracing, floor and wall diaphragms. Design of metal dowel-typed connections. Design of joints with connectors. Moment capacity of connections formed with metal dowel fasteners or connectors.

**Literature:**

1. EN 1990:2002/A1:2005 Eurocode - Basis of structural design.
2. EN 1991-1-1:2002 Eurocode 1: Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings.
3. MSZ EN 1995-1-1: 2010 Design of timber structures. Part 1-1: General. Common rules and rules for buildings
4. MSZ EN 1995-1-2: 2005 Design of timber structures. Part 1-2: General. Structural fire design.
5. Basis of structural design, Guide to Interpretative Documents for Essential Requirements, to EN 1990 and to applications use of Eurocodes; Garston, Watford, UK, 4. 2004.

Jack Porteous & Abdy Kermani: Structural Timber Design to Eurocode 5, Blackwell Publishing 2009, ISBN: 978-14051-4638-8

**Schedule**

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| **1st week:****Lecture:** Timber as a structural material: strength and elastic properties.**2nd week:** **Lecture:** Design of members subjected to flexure.**3rd week:****Lecture:** . Design of members and walls subjected to axial or combined axial and flexural actions.**4th week:****Lecture:** Design of glued laminated members.**5th week:****Lecture:** Design of composite timber and wood-based sections.**6th week:****Lecture:** Design of built-up columns.**13th week:****Lecture:** consultation**14th week:****Lecture:** consultation | **7th week:****Lecture:** Design of stability bracing, floor and wall diaphragms.**8th week:****Lecture:** Design of metal dowel-typed connections.**9th week:****Lecture:** Design of joints with connectors.**10th week:****Lecture:** Moment capacity of connections formed with metal dowel fasteners or connectors.**11th week:****Lecture:** Special timber structures: arches, frames, nailed shells and lattice structures.**12th week:****Lecture:** Comparative analysis of existing timber structures.**15th week:****Lecture:** consultation |

**Requirements**

Attendance at **lectures** is **strongly recommended**, but not compulsory. Participation at **practice classes** is **compulsory**. Students must attend 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 lectures and practice classes will be recorded by the staff of the department. Being late is equivalent with an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes should be made up for at a later date, being discussed with the tutor. Students are required to bring a calculator and the printed materials of the lectures to each lecture and practice class. Active participation is evaluated by the teacher in every class. Active student’s participation should be required.

Students have to **submit all the two tests and the five design tasks** as scheduled minimum at a sufficient level. During the semester there are two tests – the 1st test in the 8th week and the 2nd test in the 15th week – and there are three design tasks. In order to get the **signature**, minimum point of tests and design tasks has to be taken (min. 50 points of 80 points). In order to take an exam grade – minimum (2) pass grade – minimum point of the tests and the design tasks as well as exam points have to be taken (Summa minimum 61 points from 100 points). The minimum and the maximum points related to the tests and design tasks can be obtained are the following:

**Two tests:**

Test I: Maximum: **30 points** Minimum: **18 points**

Test II: Maximum: **30 points** Minimum: **18 points**

 Summa: **60 points 36 points**

**Three design tasks:**

Design Task 1: Maximum: **15 points** Minimum**: 9 points**

Design Task 2: Maximum: **10 points** Minimum**: 7 points**

Design Task 3: Maximum: **15 points** Minimum**: 9 points**

 Summa: **40 points 25 points**

**Summa points:** Maximum: **100 points** Minimum: **61 points**

The course ends in a **mid-semester grade (AW5)**. Based on the summa points of the tests and the summa points of the design tasks, the mid-semester grade is defined according to the following calculation:

 **Score Grade**

 0 – 60 points: fail (no sign)

61 – 70 points: pass (2)

71 – 80 points: satisfactory (3)

81 – 90 points: good (4)

91 – 100 points: excellent (5)