

## General Information:

Name of Course:

# BUILDING CONSTRUCTIONS 6.

Course Code:

PMRESNE142A

Semester:

7<sup>th</sup>

Number of Credits:

4

Allotment of Hours per Week:

2 Lectures, 2 Practical Lessons /Week

Evaluation:

Signature (with grade)

Prerequisites:

Completed Building Constructions 5., Building Design 5.

Instructors:

**Dr Miklós Halada, associate professor**

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## Introduction, Learning Outcomes:

The aim of the course is to give students an overview of the nonconventional load bearing structures used in building construction, to describe the forces in particular structures and to examine how these structures are used through the analysis of load bearing structures of existing buildings. Students analyse and learn about the relationship between material, structure, function and form. After a brief overview of historical structures, first of all structures cable structures, tents and membrane structures, then shell structures are discussed. Students learn about the works of several architects excelling at structural design (Frei Otto, P.L. Nervi, S. Calatrava, etc.). This subject includes an architectural design project in the practical part (marked with a P) where students can practice and further develop the content of the lectures (marked with an L).

The course will focus on:

- Manage complex architectural relationship like demonstrate a progression in terms of understanding relevant functional needs, programming and construction techniques in the same time
- Individual design processing, and developing upon relevant methodologies and design techniques
- Carrying out within a specified time

## General Course Description and Main Content:

This subject completes the study of students attending the M.Sc. programme. It aims to assess students' knowledge and expertise, and determine whether they satisfy the requirements of a M.Sc. degree.

The course includes:

- Regular (weekly) supervisions by an appointed Main Supervisor.
- A Drawing Task (selected number A/4 or A/3 pages depending on the size of project) prepared with engineering working drawings documentation (plans, sections, elevations 1:100) and with a sufficient number of detail drawings (1:10, 1:5). In the end of semester the drawing task have to be presented in the power point presentation in front of the class.
- Case study about the works of one selected architect or a structure connected to the topic of the semester, Case study contains booklet (at least 10 pages in A/4 format) and the power point presentation in front of the class.
- The drawing tasks and the case study must be printed and backed up and attached on CD/DVD.

## Methodology:

The course is based on individual and team work with regular consultations and presentations.

**Schedule:**

The semester is divided into three principle periods and attendant exercises.

The rough outline of the schedule is as follows:

	Lecture	Lab
1.	Introduction	Drawing task and Case study discussion
2.	Structural materials: Steel, Concrete, Timber Structure Systems: Form-active, Vector-active, Section-active, Surface-active	Formfinder, Physical models
3.	Cable structures	Consultation
4.	Membrane Structures, Conceptual design Formfinder	Soap film modeling
5.	Mechanically prestressed structures Formfinder	consultation
6.	Membrane materials Design software's ( ArchiCad, Rhino)	consultation, physical modelling
7.	Engineering Concept, Load conditions and behavior	Consultation
8.	Case study presentation	<b>Case study presentation</b>
9.	Holiday	Holiday
10.	Pneumatic structures	Consultation
11.	Membrane details. Instalation of the structures	Consultation
12.	Grid Shells, Tensegrity, Tensairity	Consultation
13.	Stadium roofs	Consultation
14.	Kinetic structures	Final Consultation
15.	Drawing task presentation	<b>Presentation and drawing submission</b>

**Studio Culture:**

The course is based on through collaboration, participation and discussions trough lessons. This is an interaction between Students and Faculty; used the teaching methods like 'Problem-based learning' and 'learning-by-doing'. The communication and work should be reflect a respect for fellow students and their desire to work with regard to noise levels, noxious fumes, etc – from each site of participants.

**Attendance:**

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

The highest possible grade on the late project (in two weeks) is '2'. The Design Project cannot be turned in late.

**Evaluation + Grading**

Grading will follow the course structure with the following weight: Design Task, 40%, Case Study Presentation, 30%. The remaining 20% will be assessed according to participation, progress, effort and attitude. Please note that attendance will adversely affect one's grade, both in direct grade reduction and in missing work in the development of a project. The final grade will be based on the following guidelines:

5. Outstanding work. Execution of work is thoroughly complete and demonstrates a superior level of achievement overall with a clear attention to detail in the production of drawings, models and other forms of representation. The student is able to synthesize the course material with new concepts and ideas in a thoughtful manner, and is able to communicate and articulate those ideas in an exemplary fashion in.

4. High quality work. Student work demonstrates a high level of craft, consistency, and thoroughness throughout drawing and modelling work. The student demonstrates a level of thoughtfulness in addressing concepts and ideas, and participates in group discussions. Work may demonstrate excellence but less consistently than an '5' student.

3 Satisfactory work. Student work addresses all of the project and assignment objectives with few minor or major problems. Graphics and models are complete and satisfactory, exhibiting minor problems in craft and detail.

2. Less than satisfactory work. Graphic and modelling work is substandard, incomplete in significant ways, and lacks craft and attention to detail.

1. Unsatisfactory work. Work exhibits several major and minor problems with basic conceptual premise, lacking both intention and resolution. Physical representation in drawing and models is severely lacking, and is weak in clarity, craft and completeness.

**Grading Scale:**

Numeric Grade:	5	4	3	2	1
Evaluation in points:	89%-100%	77%-88%	66%-76%	55%-65%	0-54%

**PTE Grading Policy:**

Information on PTE's grading policy can be found at the following location:

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**Students with Special Needs:**

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

**Readings and Reference Materials:**

**Required:**

Heino Engel (2007) Structure Systems

<http://www.amazon.com/Structure-Systems-Heino-Engel/dp/3775718761>

**More:**

Frieder Klenk (1998) IL 24 Lightweight Principle

Frei Otto (1976) IL 16 Tents