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Gis.Prof. Dr.-Ing. Frei Otto, Institute for Lightweight Structures and Conceptual Design, University of Stuttgart

Foto: Ali Heshmati

MEng Membrane Lightweight Structures
Vienna University of Technology
Postgraduate MEng Program
Master of Engineering (MEng)
4 semesters, part-time
MEMBRANE LIGHTWEIGHT STRUCTURES

The postgraduate MEng program “Membrane Lightweight Structures” provides postgraduate students and professionals to work in the dynamic field of structural membrane design. The program offers a profound knowledge base and prepares the students with invaluable competence and technical ability to work at any architecture or engineering office. This modular postgraduate program may also form a basis for further scientific qualification and pursuits.

A substantial goal is to provide graduates with ample tools of scientific qualification and pursuits. For years the Vienna University of Technology has been successfully offering outstanding Postgraduate Programs. This success is also based on the top scientific and economic qualifications of its faculty. This part-time program is presented in blocked modules. It takes four semesters.

FACULTY
Internationally distinguished experts are members of this highly acclaimed faculty, either through their sound interdisciplinary scientific knowledge or their extensive practical experience in the field of structural membrane design.

APPLICATION
Any graduate degree (e.g. master or bachelor degree of a foreign university or university of applied sciences) or a similar qualification which can be regarded as an equivalent thereof (e.g. similar to those of a university graduate or relevant professional experience).

DURATION
The course is a part-time program in 2 semesters. The curriculum covers all the unique aspects of design, engineering, and execution related to this specific technology. The faculty and lecturers have extensive first-hand knowledge gained from the field. In fact, (…) some of the teaching staff was there in the beginning with Frei Otto exploring and developing the foundations of membrane architecture (…).

The curriculum covers all the unique aspects of design, engineering, and construction related to this specific technology. The faculty and lecturers have extensive first-hand knowledge gained from the field. In fact, some of the teaching staff was there in the beginning with Frei Otto exploring and developing the foundations of membrane architecture. The curriculum covers all the unique aspects of design, engineering, and construction related to this specific technology. The faculty and lecturers have extensive first-hand knowledge gained from the field. In fact, some of the teaching staff was there in the beginning with Frei Otto exploring and developing the foundations of membrane architecture.
By Prof. Dr.-Ing. Frei Otto
Institute for Lightweight Structures and Computational Design, University of Stuttgart

By Dipl.-Ing. Dr.techn. Robert Wehdorn-Roithmayr
Program Coordinator
Formfinder Software GmbH

By Les Taylor
Diploma Grapher Present

FUTURE BUILDING TECHNOLOGY: MEMBRANE LIGHTWEIGHT STRUCTURES

The postgraduate MEng program "Membrane Lightweight Structures" prepares postgraduate students and professionals to work in the dynamic field of structural membrane design. The program offers a profound knowledge base and prepares the graduating students with invaluable competencies and technical ability to work at any architecture or engineering office. This modular postgraduate program may also form a basis for further scientific qualification and publications.

A substantial goal is to provide graduates with simple tools and an understanding of appropriate technologies in the field of structural fabric.

The individual modules are designed to accomplish the entire creative process from the first sketch up to the realization of membrane design.

The Vienna University of Technology – located in the heart of Austria – is the largest Austrian institution in research and education within the area of technology and natural sciences. Even though the beginnings of the TU Vienna reach back as far as 1819, research, teaching, and learning are state-of-the-art.

For years the Vienna University of Technology has been successfully offering outstanding Postgraduate Programs. This success is also based on the top scientific and economic qualifications of its faculty. The individual modules are designed to accomplish the entire creative process from the first sketch up to the realization of membrane design.

The term "building with membranes" describes architectural structures made from flexible, non-woven materials ranging from being used as a simple sail for wind-driven roofs in a stadium roof. In particular, new materials and fabrication technologies for textile façades will be dealt with.

MEMBRANE LIGHTWEIGHT STRUCTURES

Knowledge management

Scientific Methods / Research on Membrane Structures (e.g. Interviews, Images, Literature / Eds of Research Results / Publication of the Research in the Membrane Database

Design Strategies & Visual Expression

Design project workshops, physical Models and workfl ow

Sustainability of Membrane Structures

Fundamentals of Membrane Structures & Sustainability of Membrane Structures

Knowledge Management

Scientific Methods / Research on Membrane Structures (e.g. Interviews, Images, Literature / Eds of Research Results / Publication of the Research in the Membrane Database

Engineering & Analysis Software Tools

Software Tools for Membrane Structures

History of Membrane Architecture

Fundamentals of Membrane Forces & Structures / Engineering design of the Membrane Structure / Load Analysis & Dynamic / Materials and Performance / Workfl ow and Cost Estimation

Project Development of Membrane Structures

Design Strategies & Visual Expression / Design project workshops, physical Models and workfl ow

Strategies, Team Leading & Building Technology and Climate Design

Inspirational Membrane & Experimental Design

Experimental Design of Membrane Structures / Sustainability of Membrane Structures

Knowledge Management

Scientific Methods / Research on Membrane Structures (e.g. Interviews, Images, Literature / Eds of Research Results / Publication of the Research in the Membrane Database

Project Management

Project Management (Commercial, Technical & Regulatory Aspects) / Methods, Strategies, Teams leading & Building

Master’s Thesis

The MEng Program is concluded with a master’s thesis that should enhance the participant’s skills in the field of the subject according to scientific criteria. The thesis can be developed in a theoretical scientific work or as the completion of a prototype in connection with a scientific contribution.

Fundamentals

History of Membrane Architecture / Context, Content & Concept of Architectural Space / Psychology & Aesthetics of Space

Membrane Architecture & Engineering

Fundamentals of Membrane Forces & Structures / Engineering design of the Membrane Structure / Load Analysis & Dynamic / Materials and Performance / Workfl ow and Cost Estimation

Software Tools for Membrane Structures

Engineering & Analysis Software Tools / Software Tools for Designing a Membrane Structure

Project Development of Membrane Structures

Design Strategies & Visual Expression / Design project workshops, physical Models and workfl ow

Strategies, Team Leading & Building Technology and Climate Design

Inspirational Membrane & Experimental Design

Experimental Design of Membrane Structures / Sustainability of Membrane Structures

Knowledge Management

Scientific Methods / Research on Membrane Structures (e.g. Interviews, Images, Literature / Eds of Research Results / Publication of the Research in the Membrane Database

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Subject to modification.

Final Degree

The MEng Program is concluded writing a master’s thesis. Achievements of the final degree “Master of Engineering” (MEng) is granted by the Vienna University of Technology.

Duration

This part-time program is presented in blocked modules. It takes four semesters.

Target Group

A major target group is the individuals working in architects’ and engineers’ offices in the private sector or the public sector, who aim to enhance their professional career and prepare themselves for an interdisciplinary and innovative professional future. Graduate students in related disciplines are also of great value to this program.

Language of Instruction

English.

Admission Requirements

Admitted individuals must either hold an appropriate first academic degree (e.g. all Austrian academic degrees, master or bachelor degree of a foreign university or university of applied sciences) or a similar qualification which can be regarded as an equivalent thereof (e.g. degrees similar to those of a graduate student or relevant professional experience).

Knowledge is the most powerful source of innovation. The ‘Membrane Lightweight Structures’ Master Program will provide the most profound experts knowledge on architectural design and state of the art engineering expertise ranging from the analysis to workshop drawings for detailing and cutting patterns.”

“...the curricula cover all the unique aspects of design, engineering, and construction related to this specific technology. The faculty and lecturers have extensive first-hand knowledge gained from the Fafl. In fact (...) some of the teaching staff was there in the beginning with Frei Otto exploring and developing the foundations of membrane architecture (...)”. The program delves into this topic from both ends of the theoretical and its application of membrane architecture.”

“The curriculum covers all the unique aspects of design, engineering, and construction related to this specific technology. The faculty and lecturers have extensive first-hand knowledge gained from the Fafl. In fact (...) some of the teaching staff was there in the beginning with Frei Otto exploring and developing the foundations of membrane architecture (...)”. The program delves into this topic from both ends of the theoretical and its application of membrane architecture.”

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The postgraduate MEng program “Membrane Lightweight Structures” prepares postgraduate students and professionals to work in the dynamic field of structural membrane design. The program offers a solid knowledge base and prepares the graduates in research and education within the membrane architecture field. Even though the beginnings of the TU Vienna reach back as far as 1819 years research, teaching, and learning are state-of-the-art. For years the Vienna University of Technology has been successfully offering outstanding postgraduate programs. This success is also based on the top scientific and economic qualifications of its faculty.

**Technology for People – Developing Scientific Excellence and Enhancing Comprehensive Competence**

The Vienna University of Technology – located in the heart of Vienna – is the largest Austrian institution in research, teaching, and education within the area of technology and natural sciences. Even though the beginnings of the TU Vienna reach back as far as 1819 years research, teaching, and learning are state-of-the-art.

**TARGET GROUP**

The program is designed for individuals in companies and organizations, who have positioned themselves in the field of structural membranes, or who wish to do so in the future. A major target group is the individuals working in architects’ offices in the private sector, who aim to enhance their professional career and prepare themselves for an interdisciplinary and innovative professional future. Graduate students in related disciplines are also of great value to this program.

**LANGUAGE OF INSTRUCTION**

English.

**ADMISSION REQUIREMENTS**

Admitted individuals must either hold an appropriate first academic degree (e.g., a Bachelor degree of a foreign university or university of applied sciences) or a similar qualification which can be regarded as an equivalent thereof (i.e. activities similar to applied sciences) or a similar qualification which can be regarded as an equivalent thereof (i.e. activities similar to those of a university graduate or relevant professional experience).

**FACULTY**

Internationally distinguished experts are members of this highly acclaimed faculty, either through their research in interdisciplinary scientific knowledge or their extensive practical experience in the field of structural membrane design.

**CURRICULUM**

- **Fundamentals**
  - History of Membrane Architecture
  - Context, Content & Concept of Architectural Space
  - Psychology & Sociology of Space
- **Membrane Architecture & Engineering**
  - Fundamentals of Membrane Forces & Structure
  - Engineering of the Membrane Structure
  - Load Analysis & Dynamic Loading
  - Materials and Properties of Membrane Structures
  - Finite Element Analysis
- **Software Tools for Membrane Structures**
  - Engineering & Analysis Software Tools
  - Software Tools for Designing a Membrane Structure
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  - Design-project workshops, physical Models & Mock-ups
  - Building Technology and Climate Design
- **Inspirational Membrane & Experimental Design**
  - Experimental Design of Membrane Structures
  - Sustainability of Membrane Structures
- **Knowledge Management**
  - Scientific Methods & Research on Membrane Structures
  - Research on Membrane Structures (e.g. Interviews, Images, Literature & Data)
  - Data Base Management & Publication of the Research in the Membrane Database
- **Project Management**
  - Project Management (Commercial, Technical & Regulatory Aspects)
  - Methods, Strategies, Team Leading & Building Technology
- **Master’s Thesis**
  - The MEng Program is concluded with a master’s thesis that should enhance the participants’ skills in the field of the subject according to scientific criteria. The thesis can be developed in a theoretical scientific work or as the completion of a project-oriented connection with a scientific contribution.

**Program Objectives**

- **Target, context and methodological approaches of the postgraduate MEng Program “Membrane Lightweight Structures”**
  - are qualifying the participants to apply and enhance the scientific, artistic and technical knowledge and procedures in the field of building with membranes.
  - The term “building with membranes” describes architectural structures made from flexible, non-solid materials ranging from being used as a simple sail for wind sailing to a medium roof. In particular, new materials and fabrication technologies for textile façades will be dealt with.

**Final Degree**

The MEng Program is concluded writing a master’s thesis. Achievement of the final degree “Master of Engineering” (MEng) is granted by the Vienna University of Technology.

**Duration**

This part-time program is presented in blocked modules. It takes four semesters.

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— Em. Prof. Dr.-Ing. Frei Otto, Institute for Lightweight Structures and Conceptual Design, University of Stuttgart
PROGRAM START
November 21, 2013

LOCATIONS
The MEng Program is held at the Vienna University of Technology.

TIME SCHEDULE

<table>
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<tr>
<th>Unit 1</th>
<th>Unit 2</th>
<th>Unit 3</th>
<th>Unit 4</th>
<th>Unit 5</th>
<th>Unit 6</th>
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Subject to modification.

DURATION
This part-time program is presented in blocked seminars. The classes will start each day at 9.00 am and end at 7.00 pm. In addition, discussions, lectures and informal talks will be offered by guest speakers from the industry.

Master's Thesis submission
September 2015

Graduation
November 2015
TUITION FEE
EUR 14,700 (excluding expenses for travelling and accomodation)

INFO SESSIONS
Please contact us for your individual information session in Vienna.

APPLICATION
Application Deadline:
June 14, 2013

Admission Interviews:
Admission interviews will take place after individual appointment.

Download of the application form and detailed information is available on the website:
http://mls.tuwien.ac.at

FACULTY
Arch. Univ. Prof. Dr. Martin Bechthold Harvard University, Graduate School of Design (USA)
Dr.-Ing. habil. Rainer Blum Laboratorium Blum Stuttgart (Germany)
Mag.arch. Sigrid Brell-Cokcan Robots in Architecture
Dipl.-Ing. Dipl.-Ing. Johannes Braumann, BSc Robots in Architecture
Prof. Dr. Ing. Jan Cremer Hochschule für Technik Stuttgart (Germany)
Dipl.-Arch. ETH Horst Dürr IF Group (Germany)
Vladimir Ermolov Arch. Verteco (Russia)
Univ.Prof. Dr.-Ing. Dr.h.c. Lothar Gründig Technische Universität Berlin (Germany)
Arch. Dipl.-Ing. Jürgen Hennicke ILEK (Germany)
Ass.Prof. Ali Heshmati, BArch University of Minnesota (USA)
Arch. BA (Hons) Alex Heslop Architen Landrell (United Kingdom)
Dipl.Ing. Jürgen Holl technet GmbH (Germany)
Mag.arch. Dr.techn. Barbara Imhof, MSc Liquifer Systems Group
Dr. Peter Kneen Lightweight Structures Association of Australasia (Australia)
O.Univ.Prof. Dipl.-Ing. Dipl.-Ing. Johann Kollegger, MEng Vienna University of Technology
Dipl.Ing. Julian Lienhard ITKE Stuttgart (Germany)
Dipl.-Ing. Peter Resch werkraum ZT GmbH
Arch. Dipl.-Ing. Kristina Schinegger Soma Architecture Vienna
Dipl.Ing. Dr.techn. Alexander Schiftner Evolute. The geometry experts Vienna
Dipl.-Ing. P. Michael Schultes experimonde
Prof. Arch. Dipl.-Ing. Vinzenz Sedlak, PhD University of New South Wales (Australia)
Dipl.-Ing. Dr.techn. Michael Seidel Vienna University of Technology
Mauricio Soto Building Technologies and Design at California College of the Arts
Univ.Prof. Arch. Dipl.-Ing. Hannes Stiefel State University of New York at Buffalo (USA)
Dr.-Ing. Dieter Ströbel technet GmbH (Germany)
Arch. Mag. Arch. Silja Tillner TW Architekten
Arch. Dipl.-Ing. Dr.techn. Robert Wehdorn-Roithmayr Formfinder Software GmbH
Dr. techn. René Ziegler Waagner-Biro

This represents a selection of the faculty. Subject to modification.

FURTHER INFORMATION/CONTACT

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Continuing Education Center
MMag. Catherina Purrucker

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Status: May 2013

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