Computational Modeling of Membranes and Shells					
Module-No./Abbreviation	Credits	Workload	Term	Frequency	Duration
CE-WP16 /CMMS	6 CP	180 h	3 rd Sem.	Winter	1 Semester
				term	
Courses			Contact hours	Self-Study	Group Size:
Computational Modeling of Membranes and			4 SWS (60 h)	120 h	No Restrictions
Shells					
Prerequisites					
Basic knowledge of continuum mechanics (CE-P07) and linear Finite Element Methods (CE-P05) is					
strongly recommended.					
Learning goals / Competences					

After successfully completing the module the students

- can identify the elements of numerical models for membranes and shells and explain their mathematical-physical background
- are able to derive numerical discretization methods from these
- can extend the formulations discussed for membranes and shells to other constitutive laws, and implement them into existing software codes
- are able to assess the accuracy of the results of such codes

Content

The module includes the following topics:

- 1. Kinematics of membranes under large deformations
- 2. Constitutive laws for membranes
- 3. Membrane equilibrium in strong and weak form
- 4. Summary of isogeometric finite element methods
- 5. Numerical discretization methods for membranes
- 6. Extension to shell theories
- 7. Rotation-free discretization methods for Kirchhoff-Love shells
- 8. Implementation of the presented discretization methods

Teaching methods / Language

Lecture (2h / week), Exercises (2h / week) / Homework (40h) / English

Mode of assessment

Final oral test of 30 minutes (100%)

Requirement for the award of credit points

Passed oral test and passed Homework

Module applicability

- MSc. Computational Engineering
- MSc. Bauingenieurwesen

Weight of the mark for the final score $\int \frac{1}{2} \frac{1$

5 %

Module coordinator and lecturer(s)

Prof. Dr. Roger A. Sauer, Assistants

Further information