

Computational Modeling of Membranes and Shells					
Module-No./Abbreviation CE-WP16 /CMMS	Credits 6 CP	Workload 180 h	Term 3 rd Sem.	Frequency Winter term	Duration 1 Semester
Courses Computational Modeling of Membranes and Shells			Contact hours 4 SWS (60 h)	Self-Study 120 h	Group Size: No Restrictions
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 <ul style="list-style-type: none"> • can identify the elements of the numeric models for membranes and shells and explain their mathematic-physical background • are able to describe the presented numerical discretization methods • can transfer the formulations used for membranes and shells to other constitutive laws and implement them into an existing software application • are able to estimate the accuracy of those applications 					
Content The module includes the following topics: <ol style="list-style-type: none"> 1. Kinetics of membranes under large deformations 2. Constitutive laws for membranes 3. Membrane equilibrium for the strong form and the weak form 4. Summarization of the isogeometric finite element methods 5. Numerical discretization methods for membranes 6. Shell theory 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%) / Bonus points for homework					
Requirement for the award of credit points Passed oral test and passed Homework					
Module applicability <ul style="list-style-type: none"> • MSc. Computational Engineering • MSc. Bauingenieurwesen 					
Weight of the mark for the final score 5 %					
Module coordinator and lecturer(s) Prof. Dr. Roger A. Sauer, Assistants					
Further information					