Studiengang: *Program:*	**Master of Science Maschinenbau** *Master of Science in Mechanical Engineering*			FACH HOCHSCHULE LÜBECK University of Applied Sciences
1 Modul: *Module:*	**Computer Aided Techniques in Design** *Computergestützte Techniken in der Entwicklung*			**English** *Englisch*
	Semester *Semester*	**Dauer** *Duration*	**Status** *Status*	**Turnus** *Regular cycle*
	1. Semester	1 Semester	compulsory	annual
	Kreditpunkte *Credits*	**Aufwand** *Workload*	**Kontaktzeit** *Contact-hours*	**Selbststudium** *Student's efforts*
	5 ECTS	150h	3hrs/week =45h lecture 1h/week = 15hrs laboratory	30hrs Preparation 60hrs laboratory exercises

2 Beschreibung
Description

The virtual product design employs state-of-the-art methods of virtual engineering to develop complex products. Parallel design of early stage modeling and simulation of geometric and physical properties drastically cuts development times and minimizes the risks of development. Therefore, the intention is to create a complete chain beginning with the idea and ending with rapid prototyping

3 Lernziele
Learning Outcomes

After successful completion of this course, the students are capable to methods of virtual product design with several software packages under consideration of the modeling restrictions:

- preliminary design with simplified models
- CAD design
- 3D solid and fluid virtual testing by means of 3D simulation tools
- handling of interface problems between the packages
- decide between alternative methods under consideration of the advantages and disadvantages of the method

4 Schlüsselqualifikationen
Key qualifications

Sozialkompetenz *Social Competence*	Methodenkompetenz *Competence in Methods*	Selbstkompetenz / Personenkompetenz *Self-Competence Personal Competence*	Interkulturelle Kompetenz *Intercultural Competence*	Medienkompetenz *Media-Competence*
X	X	X		X

5 Lehrveranstaltung/ -methoden
Course type and methods

Lecture
- Seminar-like teaching
- Exercises and examples (case studies)
- Introduction sessions to methods – integrated course

Laboratory/Project
- Work in computing Laboratory

6 Vorbedingungen / Vorkenntnisse
Prerequisites

- CAD
- Fluid Mechanics
- Mechanics of Solids
- Mathematics (multidimensional integrals, differential calculus, partial differential equations)

7 Arbeitsmittel / Literatur
Required material / Literature

- Course packs and/ or literature as recommended in class
- Computer software in the laboratory

Detailinformationen

8 Inhalte

Course topics

virtual product design that means:

- Virtual prototype in 2D and 3D
- Virtual testing with simplified models
- Add featrues in CAD
- Virtual testing with 3D models, FEM, CFD
- Outlook – further steps - Rapid Prototyping - experiments

9 Prüfungsform

Assessment

Written Examination

10 Voraussetzung für die Vergabe von Kreditpunkten

Requirements for granting of credits

- Successful finish of project and related laboratories
- Successful passing of all individual parts of the examination according to row 9 „Assessment“

11 Weiterführende Veranstaltungen

Related courses

- Product Development in Production, Lectures of profile DESIGN

12 Zuordnung

Classification

Mathematik & Naturwissenschaft *Mathematics & Natural Sciences*	Ingenieur-wissenschaften *Engineering Science*	Ingenieur-anwendungen *Engineering Application*	Entwicklung & Konstruktion *Design*	Werkstoffe *Material*	Wirtschaft, Management, Sprachen *General Education*	Anderes *Other*
	X	X	X	X		X

13 Modulbeauftragter / Lehrpersonen

Responsible person / Lecturers

Prof. Dr. Warnack / Prof. Dr. Warnack