TECHNISCHE HOCHSCHULE LÜBECK

Module: Vibration Control

Level	Bachelor	**Short Name**	VC
Responsible Lecturers	Kral, Roland, Prof. Dr.-Ing.		
Department, Facility	Mechanical Engineering and Business Administration		
Course of Studies	Mechanical Engineering, Bachelor		
Compulsory/elective	Compulsory	**ECTS Credit Points**	4
Semester of Studies	6	**Semester Hours per Week**	4
Length (semesters)	1	**Workload (hours)**	120
Frequency	SuSe	**Presence Hours**	60
Teaching Language	English	**Self-Study Hours**	60

The following section is filled only if there is **exactly one** module-concluding exam.

Exam Type	Portfolio Exam	**Exam Language**	English
Exam Length (minutes)		**Exam Grading System**	One-third Grades
Learning Outcomes	Students - are able model simple vibratory systems. - know how to determine the equations of motion for idealized systems. - can solve the equations of motion for single degree of freedom systems subjected to harmonic, general periodic and arbitrary forcing functions. - are able to write equations of motion for idealized multi-degree of freedom systems. - can determine natural frequencies and mode shapes for systems with two and three degrees of freedom. - can establish technical measures to handle vibrations in mechanical systems as desired. - are able to identify and estimate system parameters for lumped parameter systems.		
Participation Prerequisites	Recommended are: - Mathematics (ODEs) - Basics of dynamics		

The previous section is filled only if there is **exactly one** module-concluding exam.

Consideration of Gender and Diversity Issues	✔ Use of gender-neutral language (THL standard) ✔ Target group specific adjustment of didactic methods ✔ Making subject diversity visible (female researchers, cultures etc.)
Applicability	Senior Design Project (4th year at MSOE)

01.07.2019

Remarks	The structure of the Portfolio examination will be announced in class. For example 80 % on the written final exam (90 minutes) and 20 % on exercise problems that have to be handed in.

Module Course: Vibration Control (lecture)

(of Module: Vibration Control)

Course Type	Lecture	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	4
Participation Limit		**Semester Hours per Week**	4
Group Size		**Workload (hours)**	120
Teaching Language	English	**Presence Hours**	60
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	60
SL Length (minutes)		**SL Grading System**	

The following section is filled only if there is a course-specific exam.

Exam Type		**Exam Language**	
Exam Length (minutes)		**Exam Grading System**	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	- Review: Modeling of mechanical systems - Review: Solving differential equations – analytical and numerical methods - Systems with one degree of freedom - Free vibration - Forced vibration - Transient vibrations - Systems with two and more degrees of freedom - Derivation of governing equations - Free vibrations - Forced vibrations - Vibration measurement and analysis - Vibration Control - Introduction to nonlinear vibrations - Introduction to vibrations of continuous systems
Literature	- Handouts to lecture, to exercises and to labs - Additional literature according to the list given out in class
Remarks	MATLAB/SIMULINK will be used to simulate the time response.