TECHNISCHE HOCHSCHULE LÜBECK

Module: Deep Learning

Level	Bachelor	**Short Name**	DL
Responsible Lecturers	Prof. Dr. Niklas Beuter		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	International Track		
Compulsory/elective	Compulsory elective	**ECTS Credit Points**	5
Semester of Studies	(Unspecified)	**Semester Hours per Week**	4
Length (semesters)	1	**Workload (hours)**	150
Frequency	(Flexible)	**Presence Hours**	60
Teaching Language	German/English	**Self-Study Hours**	90

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

Exam Type	Portfolio Exam	**Exam Language**	German/English
Exam Length (minutes)		**Exam Grading System**	One-third Grades
Learning Outcomes	Students understand principles of machine learning and are able to train and apply their own neural networks in a stable manner. Different layers and architectures of deep neural networks can be selected and used according to a given problem.		
Participation Prerequisites			

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	
Remarks	

Module Course: Deep Learning (Lecture)

(of Module: Deep Learning)

Course Type	Lecture	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	3
Participation Limit		**Semester Hours per Week**	3
Group Size		**Workload (hours)**	90
Teaching Language	German/English	**Presence Hours**	45
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	45
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	Introduction to Artificial Intelligence Shallow Neural Networks Deep Learning Loss Functions Training & Regularisation Convolutional Neural Networks
Literature	To be announced in the lecture
Remarks	

TECHNISCHE HOCHSCHULE LÜBECK

Module Course: Deep Learning (Exercise)

(of Module: Deep Learning)

Course Type	Exercise	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	2
Participation Limit		**Semester Hours per Week**	1
Group Size	12	**Workload (hours)**	60
Teaching Language	German/English	**Presence Hours**	15
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	45
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	See lecture description
Literature	See lecture description
Remarks	