TECHNISCHE HOCHSCHULE LÜBECK

Module: Autonomous Vehicles

Level	Master	**Short Name**	AuVeh
Responsible Lecturers	Korff, Alexander, Prof. Dr.		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Applied Information Technology, Master		
Compulsory/elective	Compulsory elective	**ECTS Credit Points**	5
Semester of Studies	2	**Semester Hours per Week**	4
Length (semesters)	1	**Workload (hours)**	150
Frequency	WiSe	**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	Project Work	**Exam Language**	German/English
Exam Length (minutes)		**Exam Grading System**	One-third Grades
Learning Outcomes	• The students know the characteristics of an autonomous system. • They can analyze existing autonomous systems and are able to discuss their abilities. • Furthermore, the students are able to design an autonomous system, choose appropriate sensors, actuators and algorithms to enable the AS to perform a certain task autonomously. • The students know the limitations of certain sensors, actuators and robotic algorithms.		
Participation Prerequisites	Dealing with a higher programming language and/or dealing with Matlab/ Simulink,ideally knowledge of ROS (Robotic Operating System) and/or mobile systems		

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: Autonomous Vehicles (Lecture)

(of Module: Autonomous Vehicles)

Course Type	Lecture	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	3
Participation Limit		**Semester Hours per Week**	2
Group Size		**Workload (hours)**	90
Teaching Language	German/English	**Presence Hours**	30
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	1. Introduction to Autonomous Systems 2. Robotics Operating System 2 3. Sensors, actuators and their use 4. Orientation and Mapping and Path Planning (3D) 5. Reasoning and System Integration
Literature	Roland Siegwart et al., Introduction to Autonomous Mobile Robots
Remarks	

Module Course: Autonomous Vehicles (Practical Training)

(of Module: Autonomous Vehicles)

Course Type	Practical Training	**Form of Learning**	Presence
Mandatory Attendance	yes	**ECTS Credit Points**	2
Participation Limit		**Semester Hours per Week**	2
Group Size	18	**Workload (hours)**	60
Teaching Language	German/English	**Presence Hours**	30
Study Achievements ("Studienleistung", SL)	Practical Training	**Self-Study Hours**	30
SL Length (minutes)		**SL Grading System**	Pass

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 the Turtlebot4 Robot Plattform Start of Project Work
Literature	Roland Siegwart et al., Introduction to Autonomous Mobile Robots
Remarks	