Machine Learning in Robotics					AR-310

Rota	Duration	Semester	SWS	Credit Points	Workload
annually SS	1 Semester	2nd (Semester)	3 SWS	5	150 h

1	**Modul Structure**				
	Course (Abbreviation)	**Type/ SWS**	**Presence**	**Self Study**	**Credit Points**
	a) Machine Learning in Robotics (LIR)	Lecture/ 2 SWS	25 h	65 h	3
	b) Machine Learning in Robotics (LIR)	Tutorial/ 1 SWS	15 h	45 h	2

2	**Language**
	English
3	**Content**
	1. Fundamentals of Machine Learning
	2. Nonlinear Regression
	3. Neural Networks
	4. Deep Learning
	5. Reinforcement Learning
	Literature:
	Ian Goodfellow, Yoshua Bengio, Aaron Courville, Deep Learning, MIT Press, 2016
	Bruno Siciliano, Oussama Khatib: Springer Handbook of Robotics, 2nd edition, 2008
	Richard Sutton, Andrew G. Barton, Reinforcement Learning an Introduction, 2nd edition, MIT Press, 2018
	Selected publications from journals and conferences.
4	**Competencies**
	The students acquire a profound knowledge of theoretical concepts and practical applications of machine learning in robotics. Students are able to solve machine learning tasks for supervised and reinforcment learning with methods and algorithms within Matlab and ROS.
5	**Examination Requirements**
	Written exam
6	**Formality of Examination**
	☒ Module Finals ☐ Accumulated Grade
7	**Module Requirements (Prerequisites)**
	none
8	**Allocation to Curriculum:**
	Program: Automation & Robotics, Field of study: Robotics, Cognitive Systems
9	**Responsibility/ Lecturer**
	apl. Prof. Dr. F. Hoffmann/ apl. Prof. Dr. F. Hoffmann