Modulbezeichnung:	Tele-Experiments with mobile robots (VHB) (TeleExMoRO) (Tele-Experiments with mobile robots (VHB))	5 ECTS
Modulverantwortliche/r:	N.N.	
Lehrende:	N.N.	

Startsemester: WS 2017/2018	Dauer: 1 Semester	Turnus: halbjährlich (WS+SS)
Präsenzzeit: 60 Std.	Eigenstudium: 90 Std.	Sprache: Englisch

Lehrveranstaltungen:

This course is an online course offered by the Virtual University of Bavaria (VHB). In order to take the course you have to create an account at www.vhb.org (free of costs). Please chose **your respective study program** at registration. **Students of Medizintechnik/Medical Engineering** have to select **"Gesundheitstechnik"** as their "Studienfach" (study program) when registering. FAU is not responsible for classes offered by external lecturers via VHB. If you have questions about the course please get in touch with the contact person on the course website.

Tele-Experiments with mobile robots (VHB) (WS 2017/2018, Vorlesung, 4 SWS, N.N.)

Inhalt:

The idea of this course is to use modern teleoperation and make robotics more approchable. Experiments part of this course can be performed via internet and these include experiments in robot kinematics, navigation of remote rovers, path planning and sensor data acquisition and processing. The real robot used in the experiments is a four wheeled ackermann steered real wheel driven indoor mobile robot designed and built at our department specifically for remote experiments.

1) Kinematics of a car-like mobile robot 2) Navigation control of a car-like mobile robot 3) Path planning of a car-like mobile robot 4) Modelling of the forward and inverse kinematics of differential drive robot 5) Sensor data acquisition and processing

"Tele-Experiments with mobile robots" is an attempt to put basic robot theory and its implementation together to bring to students an interesting and practical course. Given that this tele-course is simultaneously used as part of regular on-site lectures, the course contents are kept up-to-date and always accessible. The experiements available here include a carefully selected mixture of real-world and simulation of robotic principles. Various topics in field robotics including kinematics, navigation principles, path planning, theoretical analysis and inverse kinematics, sensor data acquisition and processing are discussed and students are presented with challenging quizzes before beginning the experiments. Sensors are also chosen so that students get confusing results and are supposed to spend time thinking about the acquired sensor values and how to interpret those. Time delay concepts in robot teleoperation on variable bandwidth networks are also transparently presented to users as part of involuntary learning.