Wintersemester 25/26

Course	Vision-based Control (3S)
Zielgruppe	Mechanical Engineering, Communications Engineering, Elektrotechnik und Informationstechnik, Automation and Safety, Angewandte Kognitions-und Medienwissenschaft, Angewandte Informatik, Wirtschaftsingenieurwesen (Wahlfach) **This course will be offered in WiSe25/26 for the last time and then be excluded from all study programms.**
URL of the course	https://lehre.moodle.uni-due.de/course/view.php?id=5883
Lecturer	Dr.-Ing. Sebastian Röttgermann (Lecturer)
About course	In winter 25/26, the course will be realized in presence at the university, presence is required, exceptions are not possible in this SEMINAR. The realization is carried out via: - Lecture - Seminar presentations and interactive discussion Registration via Moodle is required. After registration, you will receive all the necessary information. The number of participants is limited to 30. A second registration is necessary to get a topic. The basis of the course is the specified textbook mentioned in the course description. Further references for the seminar presentations will be provided and distributed later during the course and based on the students' interests. For some lecture units (initial information and basic concepts), a raw manuscript will be published which can be downloaded in the Moodle course **from the beginning of the course**. This serves to structure the personal/personalisable notes. For preparation/postprocessing of the lecture, it is strongly recommended to ➢ **read the initial lecture materials,** ➢ **attend the consultation hours for further discussion and basic seminar information,** ➢ **read additional publications to prepare the own seminar presentation, and** ➢ **read the corresponding substance in the given chapters in advance (in the specified textbook/textbook) to work out.**
Material	Moodle: Vision-based Control – VbC (https://lehre.moodle.uni-due.de/course/view.php?id=5883)

	The password can be requested via the e-mail address srs-pw@uni-due.de. The subject must contain the word **VBC**.
Day	Friday
Time	8.30 am – 12.00 pm
First course	**Kick-off-Meeting: October 24th, 2025** **Participation is mandatory for students in the Kick-off-Meeting and the presentation sessions (three appointments for the seminar presentations). An absence in any of them leads to the loss of credit for this course. This is due to the helpful and required interactive seminar character, for which an active interaction (live discussions, questions/answers) of all participants is expected and therefore mandatory).** The topics will be discussed during the sessions. The students have two weeks time to select one of the introduced topics afterward. The time of interactive seminar presentations will be discussed later based on the number of participants.
Last course	December 12th, 2025
Room	MB 243
Literature	Corke, P. I. (1996). Visual Control of Robots: high-performance visual servoing. Taunton, UK: Research Studies Press. Corke, P. I. (2017). Robotics, vision and control: fundamental algorithms in MATLAB® second, completely revised (Vol. 118). Springer. Chaumette, F., & Hutchinson, S. (2006). Visual servo control. I. Basic approaches. IEEE Robotics & Automation Magazine, 13(4), 82-90.
Content	• Fundamentals of image capturing and machine vision approaches • Modeling of the robot (manipulator or UAVs) • Image-based visual servoing • Position-based visual servoing • Design of vision-based controller e.g. adaptive controller, sliding mode controller, and fuzzy logic controller
Exam	Homework and presentation