UNIVERSITÄT DUISBURG-ESSEN
Lehrstuhl Steuerung, Regelung
und Systemdynamik
Univ.-Prof. Dr.-Ing. Dirk Söffker

Wintersemester 2023/24

Course	**Control Engineering (2L, 1E, 1P)**
Target group	ISE Bachelor Mechanical Engineering
URL of the course	https://moodle.uni-due.de/course/view.php?id=23823
Lecturer	Dr.-Ing. Fateme Bakhshande / Univ.-Prof. Dr.-Ing. Dirk Söffker
Assistant	Jonathan Liebeton, M.Sc.
About course	In WiSe 23/24, the course will be realized in person at the university. The course is based on the following material (downloadable via Moodle): - Lecture and exercise material (pdf) - Lecture video material - Exercise video material The commented material is published online 3 days before the lecture/exercise date in the Moodle course and can be downloaded. Downloading the commented versions after the lecture/exercise date is not possible. The basis of the course is the specified textbook (> available in the textbook collection). The central teaching materials are available as encrypted PDF documents in the Moodle course. For each lecture unit a raw manuscript is published which can be downloaded in the Moodle course **from the beginning of the course**. This serves to structure/individualize the personal notes. For preparation/postprocessing of the lecture it is strongly recommended ➢ **the previous substance,** ➢ **attend the appointments (lecture and exercise)** ➢ **as well as reading the upcoming substance in the given chapters in advance (in the specified textbook/textbook) to work out.**
Material	Moodle: Control Engineering - CE (https://moodle.uni-due.de/course/view.php?id=23823)
Registration in Moodle	The password can be requested via the e-mail address srs-pw@uni-due.de. The subject must contain only the word **CE**.
Day	Monday
Time	8:30 – 11:00 am
First course	October 9th

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Last course	December 11th
Room	MB 144
Consulting hours	Thursday, 10.00 am - 11.30 am, Registration via Moodle
Literature	Textbook: Lunze, J.: Regelungstechnik 1, Springer, 3. Auflage, 2001. (available in the library) **> L** Recommended additional reading: Ogata, K.: Modern Control Engineering, 4th Edition, 2002. (available in the library) **> O** Franklin, G.F.; Powell, J.D.; Emami-Naeini, A.: Feedback Control of Dynamic Systems, Prentice Hall 2002 (available in the library) Dorf, R.C.; Bishop, R.H.: Modern Control Systems, Pearson, 2005. Unbehauen, H.; Ley, F.: Das Ingenieurwissen: Regelungs- und Steuerungstechnik, Springer Vieweg, 2014
Content	
Practical Exercise	The related practical exercise System Dynamics and Control Engineering will be organized separately; it is necessary to pass an attestation to take part. The practical exercise is an additional requirement and will be graded separately.
Exam	Written exam in English or German language, 90 minutes, closed-book, registration at the examination office.

Module	**Topic:**	**Literature:**
1	Frequency behavior and Laplace transformation	L 6.1-6. O2,O8.1 + Material
2	Characteristics of elements and of loops in the frequency domain	L 6.7 O5.5,O5.9 O8.2,O8.4 + Material
3	Stability of dyn. systems	L 8.1-8.4 + Material
4	Stability of dyn. systems	L 8.5 O6,O8.7-O8.9
5	Control Design	L 9.1-11.2 O7, O10
6	Modern Control methods	Material