

| | |
|--|------------------------------------|
| Course title: Advanced and Intelligent Control Systems | Neptun code: GEVAU402-a |
| Course coordinator: Dr. Benotsmane Rabab, PhD, senior lecturer | |
| type of lesson and number of lessons: lecture (2) | |
| method of evaluation: colloquium | |
| curriculum location of the subject: (autumn/spring semester): autumn and spring | |
| pre-study conditions (<i>if any</i>): - | |
| The task and purpose of the subject: | |
| The aim of the course is to introduce students to the advanced and intelligent control used in industrial and dynamic systems. | |
| Course description: | |
| The 14-week course on Advanced and Intelligent Control is designed for PhD students seeking a comprehensive understanding of the design of control systems. This course delves into the theoretical foundations and practical applications of advanced control techniques, focusing on intelligent algorithms and methodologies that enhance system performance, robustness, and adaptability. Through a blend of theoretical lectures, hands-on exercises, and real-world case studies, students will explore topics such as adaptive control, model predictive control, fuzzy logic systems, neural networks, and evolutionary algorithms. Emphasis will be placed on the integration of these advanced control strategies in diverse engineering domains, including robotics, aerospace, automotive, and industrial automation. By the end of the course, students will have acquired the knowledge and skills necessary to tackle complex control challenges and drive innovation in the field of intelligent systems. | |
| Required literature: | |
| <ol style="list-style-type: none"> 1. Clarence W. de Silva, Lakhmi C. Jain, Intelligent Adaptive Control Industrial Applications, CRC-Press, 1999, pp. 432, ISBN:9780849398056, 0849398053. 2. Nader Jalili , Nicholas W. Candelino, Dynamic Systems and Control Engineering, ISBN: 1108831052, 2023, pp. 850. 3. Nazmul Siddique, Intelligent Control: A Hybrid Approach Based on Fuzzy Logic, Neural Networks and Genetic Algorithms, Springer Cham, ISBN: 978-3-319-34348-8, 2016, pp. 282. | |
| Recommended literature: | |
| <ol style="list-style-type: none"> 1. Robot Simulation Software: Everything You Need to Know, Visual Component 2. Matlab/Simulink | |