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| <b>Module Name</b>                                  | <b>Introduction to Systems Theory</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Module Number</b>                                | Eul-RES-C-ESysT, Eul-BMT-C-ESysT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Responsible Lecturer</b>                         | Prof. Dr.-Ing. Rafael F. Schaefer<br>rafael.schaefer@tu-dresden.de                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Qualification Objectives</b>                     | After completing the module, students are familiar with the general conceptual and methodological foundations for describing dynamic processes in nature and technology. They are able to view static and dynamic systems from a unified systems-theoretical perspective and to describe and analyze them mathematically. They are familiar with the properties of time-continuous and time-discrete systems in both the time and frequency domains and master the application of signal transformations for the effective description of system behavior in the frequency domain. |
| <b>Contents</b>                                     | The module provides an overview of selected fundamentals of systems theory, focusing on analog signals and systems with continuous time, analog signals and systems with discrete time, digital systems, and selected applications.                                                                                                                                                                                                                                                                                                                                                |
| <b>Teaching and Learning Forms</b>                  | 2 hours per week of lectures, 2 hours per week of exercises, and self-study.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Prerequisites for Participation</b>              | The competencies to be acquired in the modules Basics of Electrical Engineering, Multidimensional Differential and Integral Calculus, Function Theory, Basics of Electrical Engineering, and Dynamic Networks are required.                                                                                                                                                                                                                                                                                                                                                        |
| <b>Usability</b>                                    | The module is a compulsory module in the basic study phase of the diploma programs Biomedical Engineering and Renewable Energy Systems.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Prerequisites for the Award of Credit Points</b> | Credit points are awarded when the module examination is passed. The module examination consists of a written exam lasting 90 minutes.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Credit Points and Grades</b>                     | 5 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Frequency of the Module</b>                      | The module is offered every summer semester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Workload</b>                                     | The total workload is 150 hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Duration of the Module</b>                       | The module lasts one semester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |