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| <b>Module Name</b>                                  | <b>Rail Vehicle Basics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Module Number</b>                                | Eul-MT-E-A02G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Responsible Lecturer</b>                         | Prof. Dr.-Ing. Arnd Stephan<br>EBahnen@mailbox.tu-dresden.de                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Qualification Objectives</b>                     | Students acquire fundamental knowledge and skills for the development, design, and calculation of rail vehicles. They are able to describe the various types of rail vehicles and their specific characteristics as well as correctly interpret technical designation systems. Furthermore, they are capable of determining the basic dimensions of rail vehicles using constraint calculation methods. Students also understand the basic structure of traction vehicles, particularly the drive trains and their peripherals, and are able to analyze typical vehicle equipment in terms of their functional interrelationships. They possess the necessary system knowledge to design and configure rail vehicles in accordance with requirements. |
| <b>Contents</b>                                     | The module covers the classification and categorization of rail vehicles, coupling and buffer systems, and constraint calculations. Additional topics include the classification and structure of traction vehicles, diesel engines and their peripherals, design and operation of traction vehicles, as well as the types and structures of power transmission systems.                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Teaching and Learning Forms</b>                  | 4 hours per week of lectures, 1 hour per week of exercises, and self-study.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Prerequisites for Participation</b>              | The competencies to be acquired in the modules Introduction to Analysis and Algebra, Multidimensional Differential and Integral Calculus, Partial Differential Equations, Technical Mechanics, and Fundamentals of Kinematics and Kinetics are required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Usability</b>                                    | The module is an elective module within the elective area "Methods and Applications" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO of the main study program in the diploma program Mechatronics. It creates the prerequisites for the modules that list this module in the field "Prerequisites for Participation."                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <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 180 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 winter semester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Workload</b>                                     | The total workload is 150 hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Duration of the Module</b>                       | The module lasts one semester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |