



Subject card

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| Subject name and code | , PG_00053440 | | | | | | |
| Field of study | Electrical Engineering | | | | | | |
| Date of commencement of studies | October 2021 | | Academic year of realisation of subject | | 2024/2025 | | |
| Education level | first-cycle studies | | Subject group | | | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 4 | | Language of instruction | | Polish | | |
| Semester of study | 7 | | ECTS credits | | 8.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Department of Electrical Engineering of Transport -> Faculty of Electrical and Control Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Leszek Jarzębowicz | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 15.0 | 15.0 | 0.0 | 0.0 | 60 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 60 | | 10.0 | | 130.0 | 200 |
| Subject objectives | To gain knowledge in selected areas of the field of electromobility. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | K6_U09 | | The student is able to select power and torque ratings of electric drivetrain based on assumed acceleration and maximal speed. | | [SU1] Assessment of task fulfilment | | |
| | K6_U10 | | The student is able to select the estimated capacity of an electric car battery to achieve the assumed range. | | [SU3] Assessment of ability to use knowledge gained from the subject | | |
| | K6_K01 | | The student finds by himself/ herself information regarding selected parts of laboratory excercises. | | [SK2] Assessment of progress of work | | |
| | K6_W10 | | The student knows the structures of hybrid car drive systems and recognizes the energy transfer and transformation paths occurring in these structures. | | [SW1] Assessment of factual knowledge | | |
| Subject contents | Traction electric drives. Energy consumption of electric vehicles. Hybrid electric cars. Electric cars charging. Electromechanical equipment of electric and hybrid motor vehicles. Electric energy storage devices.Construction and diagnostics of ignition and injection systems. Ecological aspects of automotive development. Vehicle traction control systems. | | | | | | |
| | Land transport infrastructure, standard and high-speed railway lines. Categories and types of roads, construction and elements of infrastructure, road junctions and intersections. Intermodal transport, transport containerization, transhipment infrastructure. Urban transport infrastructure, categories of streets, routing of tram lines, auxiliary infrastructure, metro and city rail lines, unconventional types of urban transport. | | | | | | |
| Prerequisites and co-requisites | Accomplished course of "Electrical engineering in transport". | | | | | | |

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| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Laboratory - raports and preparation | 60.0% | 30.0% |
| | Lecture - tests | 60.0% | 40.0% |
| | Excercises - final test | 60.0% | 30.0% |
| Recommended reading | Basic literature | 1. Dentom T.: Automobile Electrical and Electronic Systems. Taylor & Francis, 2017. 2. Towpik K.: Infrastruktra transportu szynowego. OW Politechniki Warszawskiej, Warszawa, 2017. ISBN 978-83-7814-678-0 3. Hayes J.G., Goodarzi G.A.: Electric Powertrain. Energy Systems, Power Electronics and Drives for Hybrid, Electric and Fuel Cell Vehicles. Wiley 2018. 4. Ehsani M., Gao Y., Longo S., Ebrahimi K.: Modern Electric, Hybrid Electric, and Fuel Cell Vehicles. 3rd Edition. CRC Press, 2018. 5. Siłka W.: Teoria ruchu samochodu. Warszawa: WNT 2002. | |
| | Supplementary literature | 1. Skibicki J.: Pojazdy elektryczne. Część 1. Wydawnictwo PG, 2010 2. Skibicki J.: Pojazdy elektryczne. Część 2. Wydawnictwo PG, 2012 | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | <ul style="list-style-type: none">List and describe standards used in electric vehicles charging stations in Europe.Discuss the types and construction of hybrid combustion-electric cars. | | |
| Work placement | Not applicable | | |