

| STUDY MODULE DESCRIPTION FORM | | |
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| Name of the module/subject Automotive body interiors | | Code 1010615211010618561 |
| Field of study Mechanical Engineering | Profile of study (general academic, practical) general academic | Year /Semester 1 / 1 |
| Elective path/specialty Motor Vehicles | Subject offered in: Polish | Course (compulsory, elective) obligatory |
| Cycle of study: Second-cycle studies | Form of study (full-time,part-time) part-time | |
| No. of hours Lecture: 9 Classes: - Laboratory: - Project/seminars: - | | No. of credits 1 |
| Status of the course in the study program (Basic, major, other) other | | (university-wide, from another field) university-wide |
| Education areas and fields of science and art technical sciences Technical sciences | | ECTS distribution (number and %) 1 100% 1 100% |
| Responsible for subject / lecturer: dr hab. inż. Grzegorz Ślaski email: Grzegorz.Slaski@put.poznan.pl tel. 61 6652 222 Faculty of Transport Engineering ul. Piotrowo 3 60-965 Poznań | | |
| Prerequisites in terms of knowledge, skills and social competencies: | | |
| 1 | Knowledge | The student has basic knowledge in motor vehicles design, basics of machines design and basic knowledge of metal materials used in machine construction |
| 2 | Skills | The student able to read and understand technical informations in native and international language in a rea of vehicle design. The student is able to do analyses, synthetize informations, draw conclusions, formulate and justify opinions. |
| 3 | Social competencies | Understands the need and knows the possibilities of lifelong learning. |
| Assumptions and objectives of the course: To make students familiar with definitions of body interior, interior and exterior trims, the requirements for that parts and components, discussion of used materials,type of design and technology of manufacturing. | | |
| Study outcomes and reference to the educational results for a field of study | | |
| Knowledge: 1. The student has knowledge about the applied technical solutions of interior elements of motor vehicles, used materials and manufacturing technologies - [M2_W10, M2_W16] 2. The student has knowledge about the requirements necessary to be taken into consideration when designing the interior fittings of motor vehicles, taking into account functional and ergonomic requirements - [M2_W14, M2_V20] | | |
| Skills: 1. The student is able to analyze and define functional, aesthetic, structural and technological requirements for subassemblies and car body accessories - [M2_U02] 2. The student can propose a material for making parts of the car body equipment - [M2_U01] 3. The student can propose design solutions for various components and parts of car body equipment - [M2_U07] | | |
| Social competencies: 1. The student is aware of multi-aspect conditioning of requirements for subassemblies and parts of body equipment related to the needs of human being as a vehicle user as well as benefiting from the natural environment - [M2_K04, M2_K03] 2. The student is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in the event of difficulties in solving the problem - [M2_K02] | | |
| Assessment methods of study outcomes | | |

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| Written exam in a form of test and a problem questions. | | |
| Course description | | |
| <p>1. Definitions, requirements and review of interior and exterior trims and components. The structure of sub-suppliers for the manufacturing of automotive interiors.</p> <p>2. Materials used for the manufacturing interior parts - plastics - types and classification, characteristics of the most commonly used plastics (polyethylene, polypropylene, polyvinyl chloride, polyamide, polyurethane, ABS, polycarbonate, plastic molding methods (injection molding, extrusion, pressing). Ecological aspects of manufacturing plastic interior and exterior elements, use of natural fibers, wood and polymer composites containing wood.</p> <p>3. Cockpit - dashboard, center console, functions (aesthetics, functionality, safety), evolution of dashboards, design and technological aspects (parts manufacturing costs, quality, assembly costs), structural and unstructural cockpits, components of the dashboard, manufacturing technologies of dashboards - rigid, coated and foamed, examples of dashboard solutions and their manufacturers, bus dashboards, controls and indicators used in dashboards, analog, digital and virtual indicators.</p> <p>4. Steering wheel - requirements for steering wheels, types of steering wheels, steering wheel components - functions and used design solutions - frame, rim, body, sound signal switch, airbag module, multifunction steering wheel, ergonomics of steering wheel and its adjustments, materials and technologies used for steering wheels manufacturing.</p> <p>5. Seats - breakdown of seat types, functional requirements, factors affecting the feeling of seat comfort - vehicle packaging, social and individual factors, design features, static comfort (ergonomics in seat design - seating ergonomics, unit pressure), dynamic comfort (vibration perception, SEAT index, thermal comfort, sensorial comfort, weight aspect in seat design, historical evolution and currently used seat designs, mechanical structures, ranges and mechanisms of adjustment, control of seat adjustment mechanisms, technologies of car seats manufacturing.</p> <p>6. Internal linings - headliners and carpets, pillars and door panels, sound absorbing materials, sun visors and mirrors. Door upholstery, interior door mechanisms - locks, power window systems. External equipment - bumpers, front grill covers, decorative elements, spoilers, lid and door seals, glass seals. Car windows.</p> <p>7. Heating, ventilation and air-conditioning system - requirements, system architecture and applied technical solutions, air distribution elements, control.</p> | | |
| Basic bibliography: | | |
| <p>1. Zieliński A.: Konstrukcja nadwozi samochodów osobowych I pochodnych, WKiŁ, 2008</p> <p>2. Morello L., Rossini L. R., Pia G., Tonoli A.: The Automotive Body, Volume I: Components Design, Springer 2011</p> <p>3. Morello L., Rossini L. R., Pia G., Tonoli A.: The Automotive Body, Volume II: System Design, Springer 2011</p> <p>4. Michael F. Ashby, Materials Selection in Mechanical Design, Butterworth-Heinemann, Third Edition 2005</p> | | |
| Additional bibliography: | | |
| <p>1. Shishoo R. : Textile advances in the automotive industry, CRC Press, Woodhead Publishing Ltd, Cambridge, 2008</p> <p>2. Frąc W. , Krywult B.: Projektowanie i wytwarzanie elementów z tworzyw sztucznych, Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów, 2008,</p> <p>3. Bosch Automotive Handbook ?8th edition, Bentley Publishers, 2010,</p> <p>4. Safety, Comfort and Convenience Systems, Robert Bosch GmbH, 2006,</p> <p>5. Dobrzański Leszek A., Materiały inżynierskie i projektowanie materiałowe. Podstawy nauki o materiałach i metaloznawstwo, Wydawnictwo PWN-WNT, 2006</p> | | |
| Result of average student's workload | | |
| Activity | Time (working hours) | |
| 1. Participation in lectures | 9 | |
| 2. Preparation for the exam | 18 | |
| 3. Participation in the exam | 1 | |
| Student's workload | | |
| Source of workload | hours | ECTS |
| Total workload | 28 | 1 |
| Contact hours | 9 | 0 |
| Practical activities | 0 | 0 |