



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Automotive body interiors

	Course
Field of study	Year/Semester
Construction and operation of means of transport	1/1
Area of study (specialization)	Profile of study
Motor vehicles	general academic
Level of study	Course offered in
Second-cycle studies	polish
Form of study	Requirements
part-time	compulsory

Number of hours		
Lecture	Laboratory classes	Other (e.g. online)
9	0	0
Tutorials	Projects/seminars	
0	0	
<b>Number of credit points</b>		
1		

Lecturers	
Responsible for the course/lecturer: D.Sc.Ph.D. (Eng) . Grzegorz Ślaski	Responsible for the course/lecturer:
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**Prerequisites**

Knowledge: The student has basic knowledge in motor vehicles design, basics of machines design and basic knowledge of metal materials used in machine construction

Skills: The student is able to read and understand technical information in native and international language in the area of vehicle design. The student is able to do analyses, synthesize information, draw conclusions, formulate and justify opinions.

Social competencies: Understands the need and knows the possibilities of lifelong learning.

### Course objective

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.

### Course-related learning outcomes

#### Knowledge

1. The student has knowledge about the applied technical solutions of interior elements of motor vehicles, used materials and manufacturing technologies
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

#### Skills

1. The student is able to analyze and define functional, aesthetic, structural and technological requirements for subassemblies and car body accessories
2. The student can propose a material for making parts of the car body equipment
3. The student can propose design solutions for various components and parts of car body equipment

#### Social competences

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
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

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written test, which is based on answers related to the selection of given answers and open questions. Credits will be given after achieving at least 50% of points. Answers are scores from 0 to 1 point.

### Programme content

1. Definitions, requirements and review of interior and exterior trims and components. The structure of sub-suppliers for the manufacturing of automotive interiors.
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.
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.

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.

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.

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.

7. Heating, ventilation and air-conditioning system - requirements, system architecture and applied technical solutions, air distribution elements, control.

### Teaching methods

1. Lecture with a multimedia presentation - a combination of an information and problem lecture;

### Bibliography

#### Basic

1. Zieliński A.: Konstrukcja nadwozi samochodów osobowych I pochodnych, WKiŁ, 2008
2. Morello L., Rossini L. R., Pia G., Tonoli A.: The Automotive Body, Volume I: Components Design, Springer 2011
3. Morello L., Rossini L. R., Pia G., Tonoli A.: The Automotive Body, Volume II: System Design, Springer 2011
4. Michael F. Ashby, Materials Selection in Mechanical Design, Butterworth-Heinemann, Third Edition 2005

#### Additional

1. Shishoo R. : Textile advances in the automotive industry, CRC Press, Woodhead Publishing Ltd, Cambridge, 2008



2. Frąc W. , Krywult B.: Projektowanie i wytwarzanie elementów z tworzyw sztucznych, Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów, 2008,
3. Bosch Automotive Handbook 78th edition, Bentley Publishers, 2010,
4. Safety, Comfort and Convenience Systems, Robert Bosch GmbH, 2006,
5. Dobrzański Leszek A., Materiały inżynierskie i projektowanie materiałowe. Podstawy nauki o materiałach i metaloznawstwo, Wydawnictwo PWN-WNT, 2006

### Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	9	0,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	21	0,5

<sup>1</sup> delete or add other activities as appropriate