



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Automotive body construction [N2MiBP1-PS>BN]

### Course

Field of study

Mechanical and Automotive Engineering

Year/Semester

1/1

Area of study (specialization)

Motor Vehicles

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

### Number of hours

Lecture

9

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

1,00

### Coordinators

dr inż. Jerzy Kupiec

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### Lecturers

### Prerequisites

The student has basic knowledge of machine science, mechanics, the basics of machine construction and the laws of physics. The student is able to integrate the obtained information, interpret it, draw conclusions, read diagrams and technical drawings. The student is aware of the role of means of transport in human economic activity.

### Course objective

Providing students with information on the construction of car bodies.

### Course-related learning outcomes

Knowledge:

Has a general knowledge of the principles and methods of constructing working machines, in particular the methods of functional and strength calculations, mathematical optimization of mechanical structures and modeling of machine structures in 3D systems.

Has extended knowledge of the standards for working machines in the field of methods of calculating and testing machines, safety, including road safety, environmental protection as well as mechanical and electrical interface.

Has extended knowledge of the life cycle of machines, the principles of operation of working machines and destructive processes occurring during operation, such as tribological wear, corrosion, surface fatigue and volumetric aging of the material.

#### Skills:

He can correctly select the optimal material and its processing technology for typical parts of working machines, taking into account the latest achievements in material engineering.

He can estimate the cost of making a working machine or a vehicle with a high degree of complexity from a selected group of machines.

Can perform a medium complex design of a working machine or its assembly using modern CAD tools, including tools for spatial modeling of machines and calculations using the finite element method.

#### Social competences:

He is ready to critically assess his knowledge and received content.

Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on its own.

Is willing to think and act in an entrepreneurial manner.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired in the lecture is verified by a written or oral exam.

### Programme content

The module program covers the following topics:

- basic definitions, functions , body divisions,
- structure and load-bearing structures,
- concepts of torsional and flexural rigidity,
- elements of external plating,
- ergonomics,
- aerodynamics,
- passive safety in body construction.

### Course topics

Basic definitions, meaning and functions of the body, classifications and divisions of bodies.

Structure and design solutions used in vehicle bodies.

Support structures. Support frames. Self-supporting structures. Construction of supporting structures for vehicle bodies.

Vehicle body components. Floor plates, body platforms.

The flexural and torsional stiffness of the car body.

Outer plating and covers. External fittings. Windows, sunroofs, wiper mechanisms.

Ergonomics in vehicle body construction.

Aerodynamics in automotive body construction.

Passive safety of the driver, vehicle passengers and pedestrians in body construction.

### Teaching methods

Lecture with multimedia presentation.

### Bibliography

Basic

Zieliński A.: Konstrukcja nadwozi samochodów osobowych I pochodnych, WKiŁ, 2008

Morello L., Rossini L. R., Pia G., Tonoli A.: The Automotive Body, Volume I: Components Design, Springer 2011

Morello L., Rossini L. R., Pia G., Tonoli A.: The Automotive Body, Volume II: System Design, Springer 2011

Additional

Piechna J.: Podstawy aerodynamiki pojazdów. Warszawa: WKŁ 2000.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	15	1,00
Classes requiring direct contact with the teacher	9	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	6	0,50