SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Automotive Engineering, Mechatronics and Mechanics
1.3	Department	Automotive Engineering and Transportation
1.4	Field of study	Automotive Engineering
1.5	Cycle of study	Master in Science
1.6	Program of study/Qualification	Tehnici Avansate în Ingineria Autovehiculelor (Advanced Techniques in Automotive Engineering) /engineer
1.7	Form of education	Full time
1.8	Subject code	15.00

2. Data about the subject

2.1	Subject name			Vehicle body structures			
2.2	Subject area			Engineering			
2.3	Course responsible/lecturer			Prof. PhD Habil. Eng. Florin MARIASIU (florin.mariasiu@auto.utcluj.ro)			
2.4	Teachers in charge of seminars			Assoc.Prof.. PhD. Eng. Liviu SCURTU (liviu.scurtu@auto.utcluj.ro)			
2.5 Year of study	2	2.6 Semester	4	2.7 Assessment	Ex	2.8 Subject category	DS/DI

3. Estimated total time

3.1 Number of hours per week	4	3.2 of which, course:	2	3.3 applications:	2
3.4 Total hours in the curriculum	56	3.5 of which, course:	28	3.6 applications:	28

Individual study	hours
Manual, lecture material and notes, bibliography	30
Supplementary study in the library, online and in the field	40
Preparation for seminars/laboratory works, homework, reports, portfolios, essays	10
Tutoring	12
Exams and tests	2
Other activities	0

3.7	Total hours of individual study	94
3.8	Total hours per semester	150
3.9	Number of credit points	6

4. Pre-requisites (where appropriate)

4.1	Curriculum	N/A
4.2	Competence	Basic Solid Works knowledge

5. Requirements (where appropriate)

5.1	For the course	N/A
5.2	For the applications	N/A

6. Specific competences

Professional competences	• Knowledge about the main structural characteristics and functional parts of vehicles body's structure; • Knowledge about general elements of car body and chassis design and verification requests; • Knowledge about general considerations related to the aerodynamic properties of vehicles; • Knowledge about the basics of construction, operation and maintenance of car bodies and chassis. • Use of software for modelling and simulation processes
Cross competences	• Use appropriate and effective methods and techniques of modern learning; • Appropriate use of specific technical terms, in oral and written communication in a European language (English); • Develop skills of analysis, interpretation and decision processes; • Using information and communication technology (ICT).

7. Discipline objectives (as results from the *key competences gained*)

7.1	General objective	Development of skills in the field of design, operation, manufacturing and maintenance of road vehicles with knowledge of specialized areas to support the professional training.
7.2	Specific objectives	Assimilation of theoretical knowledge regarding chassis and bodies of vehicles Get skills for designing a chassis structures (use of technical documentation, software use for modeling) Conduct a modeling and computer simulation process Obtaining skills in aerodynamic optimizing of road vehicles

8. Contents

8.1. Lecture (syllabus)	Hours	Teaching methods	Notes
1. Course presentation. Purpose, objectives, requirements. Current and future trends in VBS design in automotive industry.	2	Exposure and applications. Case studies.	onsite
2.Vehicle development process	2		
3.Product Evolution Process	2		
4. Evaluation test 1	2		
5. Primary relevant vehicle characteristics	2		
6. Car chassis and body.	2		
7. Materials and fabrication technologies for VBS	2		
8. Evaluation test 2	2		
9-10. General concepts regarding the study of aerodynamic	4		
11. Aerodynamics of automobiles	2		

12. Aerodynamics of heavy vehicles	2		
13. Evaluation test 3	2		
14. Course recapitulation. Presentation of examination's subjects, conditions and requirements for final examination.	2		

Bibliography

- Morello et. al. – The automotive body, Editura Springer, 2013.
- Barnard R.H. - Road Vehicle Aerodynamic Design, Ed. Mechaero Publishing, St. Albans, 2001
- Houghton E.L. - Aerodynamics for Engineering Students, Ed. Butterworth-Heinemann, Oxford, 2003
- Neguţ, N., Hluşcu, M., Pinca-Bretotean, C. - Caroserii şi structuri portante pentru autovehicule rutiere, Ed. Politehnica, Timişoara, 2007, vol.I
- Hucho, W.H. (coord.) - Aerodynamics of Road Vehicles, SAE International, Warrendale, Pennsylvania, 1998
- Rus. I., - Autovehicule rutiere, Editura Sincron 2002, Cluj Napoca.
- Crolla. D.A. - Automotive Engineering – Powertrain, chassis system and vehicle body, Editura Elsevier, 2009.
- Course Notes

8.2 Laboratory	Hours	Teaching methods	Notes
1.Laboratory work presentation. Purpose, objectives, requirements. Modeling a vehicle chassis	4	Exposure and applications. Case studies.	onsite
2.Static and dynamic analysis of a vehicle chassis	4		
3.Topological optimization of a body car component	4		
4.Modeling an automobile body. Analysis of aerodynamic performance	4		
5.Modeling a truck body. Analysis of aerodynamic performance	4		
6.Modeling of the impact of the vehicle chassis with a barrier	4		
7.Recap works. Submission of the laboratory dosier.	4		

Bibliography

- Morello et. al. – The automotive body, Editura Springer, 2013.
- Barnard R.H. - Road Vehicle Aerodynamic Design, Ed. Mechaero Publishing, St. Albans, 2001
- Houghton E.L. - Aerodynamics for Engineering Students, Ed. Butterworth-Heinemann, Oxford, 2003
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- Course Notes

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

The skills and competences gained will be required by employees who work in automotive domain related industry: Design, operation and maintenance of road transport vehicles; Numerical modeling and simulation methods; Design and manufacturing of car structures and bodies; Auto services stations; Companies specialized in selling spare parts and accessories for car body and chassis etc.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade

10.4 Course	Participation in all periodical evaluation tests or Exam with solving theory topics specific to the discipline	The average of the grades obtained in the evaluation tests or grid test final examination	70%
10.5 Applications	Resolving of laboratories applications	Evaluation of laboratory works results	30%
10.6 Minimum standard of performance			
Perform laboratory work according to requirements Minimum 50% of test items to be solved for grid test final examination			

Date of filling in:		**Title Surname Name**	**Signature**
18.06.2025	Lecturer	Prof. PhD Habil. Eng. Florin MARIASIU	
	Teachers in charge of application	Assoc. Prof. PhD. Eng. Liviu SCURTU	

Date of approval in the department ART
24.06.2025
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Head of department
Prof.dr.ing. Istvan BARABAS

Date of approval in the faculty ARMM
25.06.2025
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Dean
Prof.dr.ing. Nicolae FILIP