



ADMISSION TO DOCTORAL STUDIES

Session September 2025

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: Prof. dr. ing. Sorin Vlase

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: Contributions to the study of structures for electric vehicles

Content / Main aspects to be considered

- *finite element analysis of stress and deformation states in vehicle structures*
- *mechanical testing of the structures and materials used*

Recommended bibliography:

- 1. Vlase S. Mecanica. Dinamica, Ed. Infomarket, 2004.**
2. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A. - *Mecanica materialelor compozite armate cu fibre*, Ed. Infomarket, 2008. ISBN 978-973-8204-98-0.

Prerequisites / Remarks:

- *knowledge of calculation methods from Mechanics and Theory of elasticity;*

TOPIC 2: *Vibrations in the structures of electric vehicles*

Content / Main aspects to be considered

- *finite element analysis of stress and deformation states in vehicle structures*
- *mechanical vibrations*

Recommended bibliography:

- 1. Vlase S. Mecanica. Dinamica, Ed. Infomarket, 2004.**
2. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A. - *Mecanica materialelor compozite armate cu fibre*, Ed. Infomarket, 2008. ISBN 978-973-8204-98-0.

Prerequisites / Remarks:

- *knowledge of calculation methods from Mechanics and Theory of elasticity;*

TOPIC 3: *Light structures for electric vehicles*

Content / Main aspects to be considered

- *finite element analysis of stress and deformation states in vehicle structures*

- <i>mechanical vibrations</i>
Recommended bibliography: 1. Vlase S. Mecanica. Dinamica,Ed. Infomarket, 2004. 2. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A. - <i>Mecanica materialelor compozite armate cu fibre</i>, Ed. Infomarket, 2008. ISBN 978-973-8204-98-0.
Prerequisites / Remarks: - <i>knowledge of calculation methods from Mechanics and Theory of elasticity;;</i>

TOPIC 4: <i>The study of the behavior of inertial platforms during earthquakes</i>
Content / Main aspects to be considered - <i>finite element analysis of stress and deformation states in vehicle structures</i> - <i>mechanical vibrations</i>
Recommended bibliography: 1. Vlase S. Mecanica. Dinamica,Ed. Infomarket, 2004. 2. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A. - <i>Mecanica materialelor compozite armate cu fibre</i>, Ed. Infomarket, 2008. ISBN 978-973-8204-98-0.
Prerequisites / Remarks: - <i>knowledge of calculation methods from Mechanics and Theory of elasticity;;</i>

TOPIC 5: <i>Analytical and numerical methods for the dynamic analysis of the human vehicle system in case of accidents</i>
Content / Main aspects to be considered - <i>finite element analysis of stress and deformation states in vehicle structures</i> - <i>mechanical vibrations</i> - <i>analytical mechanics</i>
Recommended bibliography: 1. Vlase S. Mecanica. Dinamica,Ed. Infomarket, 2004. 2. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A. - <i>Mecanica materialelor compozite armate cu fibre</i>, Ed. Infomarket, 2008. ISBN 978-973-8204-98-0.
Prerequisites / Remarks: - <i>knowledge of calculation methods from Mechanics and Theory of elasticity;;</i>

TOPIC 6: <i>Modeling the car-driver-passenger system for the analysis of impact loads to</i>

improve the load safety

Content / Main aspects to be considered

- *finite element analysis of stress and deformation states in vehicle structures*
- *mechanical vibrations*
- *analytical mechanics*
- *safety of the traffic*

Recommended bibliography:

- 1. Vlase S. Mecanica. Dinamica, Ed. Infomarket, 2004.**
2. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A. - *Mecanica materialelor compozite armate cu fibre*, Ed. Infomarket, 2008. ISBN 978-973-8204-98-0.

Prerequisites / Remarks:

- *knowledge of calculation methods from Mechanics and Theory of elasticity; Finite Element Method;*

Conducător de doctorat,

Prof. dr. ing. Sorin Vlase

Coordonatorul domeniului de doctorat,

Prof. dr. ing. Maria Luminita Scutaru

Semnătură