

## ADMISSION TO DOCTORAL STUDIES

Session September 2026

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: Prof. dr. ing. Sorin Vlase

### TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

<b>TOPIC 1: Contributions to the study of structures for electric vehicles</b>
<b>Contents / Main aspects to be considered</b> <i>- finite element analysis of stress and deformation states in vehicle structures</i> <i>- mechanical testing of the structures and materials used</i>
<b>Recommended bibliography:</b> 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.
<b>Prerequisites / Remarks:</b> <i>- knowledge of calculation methods from Mechanics and Theory of elasticity;</i>
<input checked="" type="checkbox"/> <b>Scientific Doctorate</b> <input type="checkbox"/> <b>Professional Doctorate</b>
<input checked="" type="checkbox"/> <b>without tuition fee (state budget funded)</b> <input checked="" type="checkbox"/> <b>with tuition fee or with funding from other sources than the state budget</b>

<b>TOPIC 2: <i>Vibrations in the structures of electric vehicles</i></b>
<b>Contents / Main aspects to be considered</b> <i>- finite element analysis of stress and deformation states in vehicle structures</i> <i>- mechanical vibrations</i>
<b>Recommended bibliography:</b> 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.
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<b>TOPIC 3: <i>Light structures for electric vehicles</i></b>
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<b>Contents / Main aspects to be considered</b>
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- *finite element analysis of stress and deformation states in vehicle structures*
- *mechanical vibrations*

<b>Recommended bibliography:</b>
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- 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.

<b>Prerequisites / Remarks:</b> <i>to be adapted/ completed/ deleted</i>
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<b>TOPIC 4: <i>The study of the behavior of inertial platforms during earthquakes</i></b>
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<b>Contents / Main aspects to be considered</b>
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- *finite element analysis of stress and deformation states in vehicle structures*
- *mechanical vibrations*

<b>Recommended bibliography:</b>
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- 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.

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<b>TOPIC 5: <i>Analytical and numerical methods for the dynamic analysis of the human vehicle system in case of accidents</i></b>
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<b>Contents / Main aspects to be considered</b>
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- *finite element analysis of stress and deformation states in vehicle structures*
- *mechanical vibrations*
- *analytical mechanics*

**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:**

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**TOPIC 6: *Modeling the car-driver-passenger system for the analysis of impact loads to improve the load safety***

**Contents / 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.

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Doctoral supervisor,

Prof. Dr.Eng.Sorin VLASE

Coordinator of the field of doctoral studies,

Prof. Dr. Eng.Maria Luminita SCUTARU