

ADMISSION TO DOCTORAL STUDIES

Session September 2025

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: SZÁVA Ioan

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: Theoretical and experimental study of the intumescent layers' in-deep heat insulation behaviour, applied on the steel structural elements against fire

Main aspects to be considered:

- **state of arts;**
- **evaluation by analytical methods;**
- **evaluation by numerical methods;**
- **evaluation by Dimensional Analysis;**
- experimental results;
- dimensional models validation;
- conclusions and further goals

Recommended bibliography:

1. Baker, W. et al., *Similarity Methods in Engineering Dynamics*, Elsevier, Amsterdam, 1991.
2. Barenblatt, G.I., *Dimensional Analysis*, Gordon and Breach, New York, 1987.
3. Deutsch, I., *Rezistența Materialelor*, Ed. Did. și Pedag. București, 1979.
4. Doebelin, O.,E. *Measurement systems – Application and design*. McGraw – Hill Publishing Company. New York, 1990.
5. D.R. Mocanu, ș.a. *Analiza experimentală a tensiunilor*. Vol.I și II. Editura Tehnică, 1977.
6. Ch. Rohrbach, *Handbuch für Experimentelle Spanungsanalyse*. VDI-Verlag GmbH, Düsseldorf, 1989.
7. Sedov, I.L., *Similarity and Dimensional Methods in Mechanics*, MIR Publisher, Moscow, 1982.
8. Száva, I. și col., *Metode experimentale în dinamica structurilor mecanice*, Vol.I. și II., Ed Universității Transilvania din Braşov, 2000.
9. Szirtes, Th., *Applied Dimensional Analysis and Modelling*, McGraw-Hill, Toronto, 1998.

Prerequisites: basic knowledge on numerical methods, experimental methods and

Dimensional Analysis

 **Scientific Doctorate (full-time only)**

 **Professional Doctorate (full-time or part-time)**

 **without tuition fee (state budget funded)**

 **with tuition fee or with funding from other sources than the state budget**

TOPIC 2: Theoretical and experimental study of the load-bearing capacity of some thin-walled structural elements unprotected, respectively fire-protected with intumescent paint

Main aspects to be considered:

- state of arts;
- evaluation by analytical methods;
- evaluation by numerical methods;
- evaluation by Dimensional Analysis;
- experimental results;
- dimensional models validation;
- conclusions and further goals

Recommended bibliography:

1. Baker, W. et al., *Similarity Methods in Engineering Dynamics*, Elsevier, Amsterdam, 1991.
2. Barenblatt, G.I., *Dimensional Analysis*, Gordon and Breach, New York, 1987.
3. Deutsch, I., *Rezistența Materialelor*, Ed. Did. și Pedag. București, 1979.
4. Doebelin, O.,E. *Measurement systems – Application and design*. McGraw – Hill Publishing Company. New York, 1990.
5. D.R. Mocanu, ș.a. *Analiza experimentală a tensiunilor*.Vol.I și II. Editura Tehnică, 1977.
6. Ch. Rohrbach, *Handbuch für Experimentelle Spanungsanalyse*.VDI-Verlag GmbH, Düsseldorf, 1989.
7. Sedov, I.L., *Similarity and Dimensional Methods in Mechanics*, MIR Publisher, Moscow, 1982.
8. Száva, I. și col., *Metode experimentale în dinamica structurilor mecanice*, Vol.I. și II., Ed Universității Transilvania din Brașov, 2000.
9. Szirtes, Th., *Applied Dimensional Analysis and Modelling*, McGraw-Hill, Toronto, 1998.

Prerequisites: basic knowledge on numerical methods, experimental methods and Dimensional Analysis

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TOPIC 3: Theoretical and experimental study of the mechanical characteristics of some orthotropic materials, used in engineering

Main aspects to be considered:

- **state of arts;**
- **evaluation by analytical methods;**
- **evaluation by numerical methods;**
- **evaluation by modern optical methods;**
- experimental results;
- the proposed (analytic and numeric) model's validation by experimental measurements;
- conclusions and further goals

Recommended bibliography:

1. Deutsch, I., *Rezistența Materialelor*, Ed. Did. și Pedag. București, 1979.
2. Doebelin, O.,E. *Measurement systems – Application and design*. McGraw – Hill Publishing Company. New York, 1990.
3. D.R. Mocanu, ș.a. *Analiza experimentală a tensiunilor*.Vol.I și II. Editura Tehnică, 1977.
4. Ch. Rohrbach, *Handbuch für Experimentelle Spanungsanalyse*.VDI-Verlag GmbH, Düsseldorf, 1989.
5. Száva, I. și col., *Metode experimentale în dinamica structurilor mecanice*, Vol.I. și II., Ed Universității Transilvania din Brașov, 2000.

Prerequisites: basic knowledge on numerical methods and experimental methods

 **Scientific Doctorate (full-time only)**

 **Professional Doctorate (full-time or part-time)**

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Doctoral supervisor,

Prof. dr. **SZÁVA Ioan**

Semnătură

Coordinator of the field of

doctoral studies,

Prof. dr. ing. habil. Maria Luminița SCUTARU

Semnătură