

ADMISSION TO DOCTORAL STUDIES

Session September 2025

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: Prof. Dr. Eng. Camelia Cerbu

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Research on the mechanical behaviour of joints used in composite material structures.*

Contents / Main aspects to be considered

- analytical models for calculating stresses and deformations in elements such as plates or shells made of composite materials;
- finite element analysis of stress and strain fields in joints between components made of composite materials;
- mechanical testing of joints in composite material structures.

Recommended bibliography:

1. Barbero E. J., Finite element analysis of composite materials, CRC Press Taylor & Francis Group, ISBN -13: 978-1-4200-5434-0, Boca Raton, 2008;
2. Cerbu Camelia, Curtu I., Mecanica şi rezistenţa materialelor compozite, Editura Universităţii Transilvania din Braşov, ISBN 978-973-598-614-8, 2009, format B5, 264 pagini;
3. Chiriacescu S. T., Balcu I., Introducere în teoria elasticităţii şi rezistenţa materialelor, Editura Universităţii Transilvania din Braşov, 2008, ISBN 978-973-598-244-7;
4. Năstăsescu V., Bârsan Gh. Elasticitate şi plasticitate. Capitole speciale, Editura Academiei Forţelor Terestre „Nicolae Bălcescu”, Sibiu, 2021;
5. Hadăr A., Structuri din compozite stratificate - Metode, algoritmi şi programe de calcul, Editura Academiei Române, Bucureşti, 2002;
6. Tenek L.T., Argyris J. Finite element analysis for composite structures. Kluwer Academic Publishers, 1998, ISBN 0-7923-4899-0.
7. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A., Mecanica materialelor compozite armate cu fibre, Editura Infomarket, 2008. ISBN 978-973-8204-98-0.

Prerequisites / Remarks:

- knowledge of the fundamental concepts and calculation methods from the disciplines Strength of Materials and Theory of elasticity;
- knowledge of the basic concepts regarding the mechanics of the laminated fiber-reinforced composite materials.

☒ **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: *Research on stress concentrators in laminated composite materials with holes.*

Contents / Main aspects to be considered

- analytical models for calculating stresses and deformations in elements such as plates or shells made of composite materials;
- finite element analysis of stress and strain fields in composite material structures;
- experimental analysis of strains in laminated composite materials with holes.

Recommended bibliography:

1. Barbero E. J., Finite element analysis of composite materials, CRC Press Taylor & Francis Group, ISBN -13: 978-1-4200-5434-0, Boca Raton, 2008;
2. Cerbu Camelia, Curtu I., Mecanica și rezistența materialelor compozite, Editura Universității Transilvania din Brașov, ISBN 978-973-598-614-8, 2009, format B5, 264 pagini;
3. Chiriacescu S. T., Balcu I., Introducere în teoria elasticității și rezistența materialelor, Editura Universității Transilvania din Brașov, 2008, ISBN 978-973-598-244-7;
4. Năstăsescu V., Bârsan Gh. Elasticitate și plasticitate. Capitole speciale, Editura Academiei Forțelor Terestre „Nicolae Bălcescu”, Sibiu, 2021;
5. Hadăr A., Structuri din compozite stratificate - Metode, algoritmi și programe de calcul, Editura Academiei Române, București, 2002;
6. Tenek L.T., Argyris J. Finite element analysis for composite structures. Kluwer Academic Publishers, 1998, ISBN 0-7923-4899-0.
7. Vlase, S., Teodorescu, H., Purcărea, R., Modrea, A., Mecanica materialelor compozite armate cu fibre, Editura Infomarket, 2008. ISBN 978-973-8204-98-0.

Prerequisites / Remarks:

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- knowledge of the basic concepts regarding the mechanics of the laminated fiber-reinforced composite materials.

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Doctoral supervisor,

Prof. Dr. Eng. Camelia CERBU

Signature

Coordinator of the field of doctoral studies,

Prof. Dr. Eng. Maria Luminița SCUTARU

Signature