



ADMISSION TO DOCTORAL STUDIES

Session September 2026

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: Assoc. prof. Daniela Şova

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Biomass valorisation in ecological composites with high thermal insulation and humidity control properties*

Contents / Main aspects to be considered - *to be adapted/ completed/ deleted*

Identification of biomass and adhesives for use in composites

Composites manufacturing (materials, methods, parameters)

Mathematical and numerical modeling of heat and mass transfer in composites

Experimental analysis of heat and mass transfer in composites

Recommended bibliography:

1. Incropera F.P., Dewitt D.P., Bergman T.L. Lavine A.S. Fundamentals of heat and mass transfer, John Wiley & Sons, New York, 2007
2. Amarasinghe I.T., Qian Y., Gunawardena T., Mendis P., Belleville B. Composite panels from wood waste: a detailed review of processes, standards, and applications, Journal of Composites Science, 8, 417, 2024
3. Zohra Mesli I. F., Hachemi H., Benosman A. S., Taleb O., Houti F. B., Seladji C., Mouaissa M. S. Enhancing thermal insulation and humidity control in composite plaster mortars with olive pomace waste: Experimental and numerical study. Energy and Buildings, 351, 2026
4. Behera D., Pattnaik S. S., Manna S., Das N., Behera A. K. Sustainable valorization of lignocellulosic biomass into green composites: Recent advances, applications, and future perspectives. Sustainable Materials and Technologies, 46, 2025
5. Cao Y., Su J., Xiao Y., Ren J., Algadi H., Yeszhanova E., Sartayeva A., Huang J., Guo Z., Tynybekov B., Min, Y. Functional biomass/biological macromolecular phase change composites and their applications in different scenarios: A review. International Journal of Biological Macromolecules, 2025
6. Peng X., Fu N., Lei Y., Li Z., Cao M., Wang J., Chen Y., Qin Y., Chang Z., Li H., Zhang P., Du W., Pan B. High value utilization of biomass: Moving towards a carbon neutrality future. Renewable and Sustainable Energy Reviews 226, 2026

Prerequisites / Remarks: *to be adapted/ completed/ deleted*

Notions of heat and mass transfer

Notions of mathematical and numerical modeling of heat and mass transfer

Scientific Doctorate

Professional Doctorate

without tuition fee (state budget funded)

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

Doctoral supervisor,

Assoc. Prof. Dr. Eng. Daniela Şova

Coordinator of the field of doctoral studies,

Prof. Dr. Eng. Maria-Luminița Scutaru