UNIVERSITATEA BABEŞ-BOLYAI
BABEŞ-BOLYAI TUDOMÁNYEGYETEM
BABEŞ-BOLYAI UNIVERSITÄT
BABEŞ-BOLYAI UNIVERSITY
TRADITIO ET EXCELLENTIA

Tradiție și Excelență prin
Cultură - Știință - Inovație din 1581

Facultatea de Chimie și Inginerie Chimică
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TOPICS OF THE PHD SUPERVISORS
for Admission to the Doctoral Studies in Chemical Engineering
July and September 2025

PhD supervisor Prof. Călin Cristian CORMOȘ

1. Fundamental elements of chemical reaction engineering applied for homogenous and heterogeneous systems;
2. Fundamental elements of conceptual design and thermal integration of chemical processes;
3. Basic elements of CO_2 capture and utilization technologies.

Bibliography

1. O. Levenspiel, *Chemical reaction engineering*, John Wiley & Sons, New York, 1999.
2. E. Gavrilă, I. Bildea, V. Topan, S. Agachi, *Ingineria reacţiilor chimice. Utilaj specific*, Universitatea Babeş – Bolyai, Cluj – Napoca, vol. I+II, 1988.
3. C.C. Cormos, *Ingineria Reacţiilor Chimice, Aplicaţii practice pentru studiul reactoarelor omogene şi eterogene gaz-lichid*, Presa Universitara Clujana, 2014.
4. R. Smith, *Chemical process – Design and integration*, 2-nd edition, John Wiley & Sons, 2016.
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PhD supervisor Prof. Vasile Mircea CRISTEA

1. Fundamentals of modelling and simulation of the transfer phenomena (momentum, heat and mass) for systems with concentrated and distributed parameters;
2. Fundamentals of automatic control of chemical processes using classical algorithms and algorithms based on mathematical models;
3. Fundamentals of artificial intelligence: artificial neural networks, fuzzy logic and genetic algorithms;
4. Fundamentals of optimization and optimal control of chemical processes.

Bibliography

1. M.V. Cristea, P.S. Agachi, *Elemente de Teoria Sistemelor,* Editura Risoprint, Cluj-Napoca, 2002.
2. P.S. Agachi, M.V. Cristea, *Basic Process Engineering Control,* Editura Walter De Gruyter GmbH, Berlin, 2014.
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4. P.S. Agachi, *Automatizarea proceselor chimice*, Casa cărţii de Ştiinţă, Cluj-Napoca, 1994.
5. A. Sipos, V. M. Cristea, E. Mudura, A. Imre-Lucaci, D. Bratfalean, *Modelarea, simularea şi conducerea avansată a bioproceselor fermentative*, Editura Universităţii "Lucian Blaga" din Sibiu, Vol. II, 2010.
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PhD supervisor Prof. Graziella Liana TURDEAN

1. Nanomaterials. Structural characterization and properties of nanomaterials;
2. Chemically modified electrodes. Preparation methods;
3. Electrochemical techniques of investigation for bio/materials having redox, electrocatalytic or host-guest complexation properties. Cyclic voltammetry.

Bibliography

1. (a) Cao G., *Nanostructures and nanomaterials. Synthesis, properties, and applications*, Imperial College Press, 2004, chap 8, pp. 329-344;
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   (b) Bard A. J., Faulkner L. R., E*lectrochemical methods. Fundamentals and applications*, Wiley, New York, 2001, chap 6, p. 226-243;
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PhD supervisor Prof. Ana-Maria CORMOȘ

1. Modeling and simulation of chemical and biochemical processes.
2. Dynamic modeling and simulation of carbon dioxide capture processes.
3. Multiscale modeling of heterogeneous gas-solid processes (catalytic and non-catalytic).

Bibliography

1. W.L.,Luyben, *Process modeling simulation and control for chemical engineers*, second edition, McGraw-Hill, 1996;
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PhD supervisor Prof. Réka BARABÁS

1. Fundamentals of nano-biomaterials. Preparation methods
2. Engineering of nano-biomaterials
3. Characterization of nano-biomaterials

Bibliography

1. C. Bréchignac, P. Houdy, M. Lahmani: *Nanomaterials and Nanochemistry*, Springer-Verlag Berlin Heidelberg, 2007
2. K. Ohno, M. Tanaka, J. Takeda, Y. Kawazoe: *Nano- and Micromaterials*, Springer, Heidelberg, 2008
3. Guozhong Cao: *Nanostructures Nanomaterials Guozhong Cao*, Imperial College Press, 2004
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