



TOPICS OF THE PHD SUPERVISORS for Admission to the Doctoral Studies in Chemical Engineering July and September 2023

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 CO₂ 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 reacțiilor chimice. Utilaj specific*, Universitatea Babeș – Bolyai, Cluj – Napoca, vol. I+II, 1988.
3. C.C. Cormos, *Ingineria Reacțiilor Chimice, Aplicații practice pentru studiul reactoarelor omogene și eterogene gaz-lichid*, Presa Universitara Clujana, 2014.
4. R. Smith, *Chemical process – Design and integration*, 2-nd edition, John Wiley & Sons, 2016.
5. W.D. Seider, J.D. Seader, D.R. Lewin, *Product & process design principles*, John Wiley & Sons, 2004.
6. C.C. Cormos, *Decarbonizarea combustibililor fosili solizi prin gazeificare*, Presa Universitara Clujana, 2008.
7. Intergovernmental Panel on Climate Change (IPCC), Special report: *Carbon Dioxide Capture and Storage*, 2005, www.ipcc.ch.



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.
3. P.S., Agachi, Cristea M.V., A.A. Csavdari, B. Szilagy, *Advanced Process Engineering Control*, Editura Walter De Gruyter GmbH, Berlin, 2016.
4. P.S. Agachi, *Automatizarea proceselor chimice*, Casa cărții de Știință, Cluj-Napoca, 1994.
5. A. Sipos, V. M. Cristea, E. Mudura, A. Imre-Lucaci, D. Bratfalean, *Modelarea, simularea și conducerea avansată a bioprocесelor fermentative*, Editura Universității "Lucian Blaga" din Sibiu, Vol. II, 2010.
6. K.M. Hangos, I.T. Cameron, *Process Modelling and Model Analysis*, Academic Press, 2001.



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;
(b) Hodoroaba V.-D., Unger W., Shard A., *Characterization of Nanoparticles: Measurement Processes for Nanoparticles*, 2019, pp. 7-217;
(c) Tantra R., *Nanomaterial Characterization: An Introduction*, 2016, pp. 153-179.
2. (a) Durst R. A., Baumner A. J., Murray R. W., Buck R. P., Andrieux C. P., *Chemically modified electrodes: recommended terminology and definitions*, Pure & App. Chem., 1997, 69(6), 1317-1323;
(b) Kenneth L. Brown, *Electrochemical preparation and characterization of chemically modified electrodes*, book chapter, DOI: 10.5772/intechopen.81752.
3. (a) Mureșan L., Oniciu L., *Electrochimie aplicată*, Presa Universitară Clujeană, Cluj-Napoca, 1998;
(b) Bard A. J., Faulkner L. R., *Electrochemical methods. Fundamentals and applications*, Wiley, New York, 2001, chap 6, p. 226-243;
(c) Kaifer A., Gomez-Kaifer M., *Supramolecular Electrochemistry*, Wiley, New York, 1999.



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;
2. O. Levenspiel, *Chemical reaction engineering*, John Wiley & Sons, New York, 1999;
3. A. Imre-Lucaci, A. M. Cormoș, *MATLAB, exemple și aplicații în ingineria chimică*, Ed. Presa Universitară Clujană, Cluj-Napoca, 2008;
4. S. Dragan, I. Siminiceanu, *Studii de caz în procese chimice gaz-lichid și gaz-solid necatalitice*, RISOPRINT, Cluj-Napoca, 2006;
5. B. Roffel, B. Betlem, *Process Dynamics and Control*, John Wiley & Sons, New York, 2006;
6. C.C. Cormos, *Decarbonizarea combustibililor fosili solizi prin gazeificare*, Presa Universitară Clujana, 2008.

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. Bréchnignac, 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
4. Venina dos Santos, *Rosmary Nichele Brandalise*, Michele Savaris: *Engineering of Biomaterials*, Springer, 2017